



NIRMALA COLLEGE MUVATTUPUZHA

Muvattupuzha P. O., Ernakulam Dist., Kerala - 686 661

Telephones: 0485 2832361, 2836300

e-mail: nirmalacollege@gmail.com, Website: www.nirmalacollege.ac.in

FOURTH CYCLE NAAC ACCREDITATION 2019

CRITERION 6

GOVERNANCE, LEADERSHIP AND MANAGEMENT

6.5.2 The institution reviews its teaching learning process, structures & methodologies of operations and learning outcomes at periodic intervals through IQAC set up as per norms

Submitted to



THE NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL

CRITERION 6

GOVERNANCE, LEADERSHIP AND MANAGEMENT

6.5.2 The institution reviews its teaching learning process, structures & methodologies of operations and learning outcomes at periodic intervals through IQAC set up as per norms

I. IQAC Teaching Learning Review Mechanism	
Department Academic Plans	03
Teacher Performance Record	19
Course Plan	83
Remedial Policy	91
Mentoring Policies	94
Performance Evaluation	96
Curriculum Feedback	100
Continuous Internal Evaluation	101
Comprehensive Result Analysis	133
II. IQAC Institutional Review Mechanism	
Annual Academic and Administrative Audit	134
Peer Evaluation	154
Green Audit	158
Gender Audit	315
Institutional Performance	335
III. IQAC Evaluation of Learning Outcomes	
Outcome Based Education (OBE) & Outcome Mapping	336
POs, PSOs, COs- Learning Outcomes	344
Course File	345

NIRMALA COLLEGE MUVATTUPUZHA

DEPARTMENT OF BOTANY

Academic Plan 2014-2015

June

- Commencement of classes of value added courses in flower arrangement and apiculture

July

- Renovation of Botanical garden
- Commencement of Mentoring session

August

- Counselling for needy students
- Parents meeting of third year and second year students
- Remedial coaching for slow learners
- Orientation class for first year students

September

- Inauguration of Botany association by Dr. Thomas Mathew, U. C. College, Aluva
- Onam Celebration
- Commencement of add - on course classes

October

- Establishment of spices garden in the campus
- Parents meeting of first year students
- Field visit of first year students

November

- Department Alumni meet

December

- UGC sponsored National seminar (anticipated) on Beneficial Fungi with special reference to Mushroom cultivation, Mycorrhizha and Fungal biocontrol agents



January

- Study tour of final year students

February

- Practical model exam and model viva

March

- Meeting of former faculty members
- Send off meeting of Prof. Ansy P.S.



S. Teasy Joseph
N.O.D
Department of Botany
Nirmala College, Nuvattupuzha

NIRMALA COLLEGE MUVATTUPUZHA

DEPARTMENT OF BOTANY

ACADEMIC PLAN 2015- 2016

SL NO	DATE	PROGRAMMES TO BE ORGANIZED
1.	17/06/2015	: A Talk related to 'World day to compact Desertification & Drought and Environmental week celebration
2.	18/06/2015	: Commencement of classes of value - added course
3.	20/06/2015	: Flower arrangement, flower making and dry flower decoration
4.	26/06/2015	: Seminar on 'International day against Drug Trafficking and Abuse
5.	27/06/2015	: A talk related to ' Plant Tissue Culture'
6.	04/07/2015	: One Day Seminar related to 'Perfume Industry and Aromatheraphy
7.	06/07/2015	: Commencement of add- on course
8.	11/07/2015	: Counselling for needy students
9.	22/07/2015	: Essay competition on the Topic 'ENERGY CONSERVATION'
10.	25/07/2015	: Painting Competition
11.	01/08/2015	: Onam Celebration
12.	16/08/2015	: Parents meeting of third year students



13. 17/08/2015 : Parents meeting of second year students
14. 19/09/2015 : A talk by P. V Saji related to 'Ozone Day'
15. 26/09/2015 : One day seminar on the topic 'BIOTECHNOLOGY'
16. 03/10/2015 : Campus Cleaning
17. 08/10/2015 : Parents meeting of first year students
18. 14/10/2015- : Study tour for III B.Sc Botany
17/10/2015
19. 31/10/2015 : Talk on the topic 'Apiculture'
20. 05/12/2015 : A Talk related to 'Aids Day'
21. 09/01/2016 : Exhibition of Medicinal Plants
22. 23/01/2016 : One day seminar related to 'Gardening'
23. 13/02/2016 : Talk on 'Plant Propagation Methods'
24. 20/02/2016 : Seminar related to 'Science Day'



Sa. Terey Joseph
 H.O.D
 Department of Botany
 Nirmala College, Muvattupuzha

**NIRMALA COLLEGE, MUVATTUPUZHA
DEPARTMENT OF BOTANY**

Academic Plan 2016-17

Sl. No.	Date of proposed activity	Activity	Resource person	Target group
1.	16/06/2016	KSCSTE sponsored Environment day lecture	Dr. T. K. A Nair, IAS	Students and public
2.	20/06/2016	Commencement of value added course		Students
3.	22/06/2016	Commencement of Add-on course		Students
4.	09/07/2016	Field visit to home grown nursery	Dr. Sunny George Home grown nursery	Students
5.	15/08/2016	Parents meeting of third year students		Parents and third year students
6.	16/08/2016	Parents meeting of second year students		Parents and second year students
7.	18/08/2016	Counselling for needy students	Sr. Rosmin	Students
8.	23/8/2016	Seminar on Organic Farming	Dr. Mary Benega (Rtd. Senior Agriculture Officer)	Students and public
9.	31/08/2016	Botany Association Inauguration	Dr. Benny Jacob Asso. Prof. M. A. College, Kothamangalam	Students
10.	01/09/2016	Orientation Programme for first year students	Mr. Jijo Chittadi, Kensu Foundation	Students
11.	20/10/2016	Field visit of first year students for plant diversity study	-	First year students
12.	29/10/2016	Botany Alumni meet	-	Former faculty and Alumni of Botany
13.	25/11/2016	Workshop on Flower Arrangement	Ms. Kitty, Cochin Flora, Ernakulam	Students
14.	30/11/2016	Painting competition		students
15.	02/12/2016	Celebrating International year of Pulses in association with Kerala Agricultural University, Pattambi	Dr. C.R. Elsy Prof. KAU, Pattambi	Students and public



16.	15/12/2016	Visit to a research institute	CMFRI/ Rice research station Pattambi	Students
17.	20/01/2017-23/01/2017	Study Tour final year students	Wayanad & Ooty	III B students
18.	20/02/2017	Invited talk on Bioinformatics	Dr. Toji Thomas, St. Thomas College, Pala	Students
19.	25/02/2017	Botany Quiz competition	Dr. Shubin Mohanan	Students
20.	03/03/2017	Model Practical and viva		Students



H.O.D
Department of Botany
Nirmala College, Muvattupuzha

Sr. Tassy Joseph

NIRMALA COLLEGE, MUVATTUPUZHA
DEPARTMENT OF BOTANY

Academic Plan 2017-18

Sl. No.	Date of proposed activity	Activity	Resource person	Target group
1.	12/06/2017	KSCSTE Sponsored Environments Day Celebrations (Anticipated)	Dr V. S Vijayan	Students and public
2.	19/06/2017	Commencement of value added course	Ms. Jaiby Cyriac	Students
3.	27/06/2017	Commencement of Add-on course	Mr. Bobby	Students
4.	22/07/2017	Field visit of Second year students		Second year students
5.	22/08/2017	Parents meeting Third year and second year students		Parents and students
6.	24/08/2017	Workshop on Mushroom cultivation	Dr. Madhusudhanan St. Albert's College	Students
7.	13/09/2017	Monthly lecture on Apiculture	Dr. Benny Daniel	Students, public and SHG members
8.	18/09/2017	Extension activity- Training on mushroom cultivation	Dr. Sr. Tessy Joseph	Public and SHG members of Avoly Grama panchayath
9.	20/09/2017	Botany Association Inauguration	Dr. M. S. Francis Asso. Prof. S. H. College, Thevara	Students
10.	22/09/2017	Orientation programme for first year students	Mr. Jijo Chittadi, Kensu Foundation	First Year students
11.	19/10/2017	Botany Alumni Association		Former faculty and Alumni of Botany
12.	18/11/2017	Life skill Development programme	Dr. James Manihottam	Students
13.	01/12/2017	Visit to a Research Institute and job training		Students
14.	13/12/2017	Workshop on flower arrangement	Dr. Lissy Mathew, HOD, Botany, St. Therasas College Ernakulam	Students



15.	16/12/2017	Orientation programme for parents on effective parenting	Dr. James Manithottam	Parents
16.	10/01/2018	Workshop on Apiculture	Mr. T. K. Raveendran	Public and students
17.	12/02/2018	Personal counselling for needy students	Sr. Rosmin	Students
18.	16/02/2018	Workshop on Bonsai making		Students
19.	20/02/2018	Field visit of First year students		Students
20.	27/02/2018	Model Practical examination and viva		Final year students

Sr. Tessa Joseph

H.O.D.
Department of Botany,
Nirmala College, Muvattupuzha

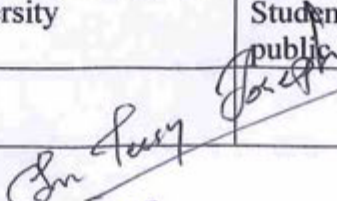


**NIRMALA COLLEGE, MUVATTUPUZHA
DEPARTMENT OF BOTANY**

Academic Plan 2018-19

Sl. No.	Date of proposed activity	Activity	Resource person	Target group
1.	05/07/2018	Commencement of value added courses		Students
2.	06/08/2018	Orientation programme for first year students	Mr. Jijo Chittadi	First year students
3.	14/08/2018	Seminar on Medicinal Plants	Dr. Jomy Augustine	Students and public
4.	18/09/2018	Ozone Day Lecture	Sri. C. Jayakumar	Students
5.	28/09/2018	Alumni meet		Former faculty and alumni
6.	12/10/2018	Workshop on Spawn Production	Sri. Sreekumar	Students and public
7.	05/12/2018-08/12/2018	Study tour of Final Years		Final year Students
8.	14/12/2018	Extension activity- Training on mushroom cultivation	Dr. Sibi C. Varghese	Public and Self Help Groups
9.	24/01/19	Launching of Nirmala Naturals	Ms Asha Sanil	Students and public
10	15/02/19	Wetland Day celebrations	Dr. Bijoy Nandan, CUSAT	Students and public
11	26/02/19	P.T.A meeting for II B students		Students and parents
12	27/02/19	P.T.A meeting for IB students		Students parents
13	04/03/19	Model practical and viva		Final year students
14	08/03/19	Botany Exhibition		Students and public
15	09/03/19	Cleaning of Botanical Garden		Students
16	12/03/19	Prof. K.V. Joseph Endowment Lecture -2019	Dr. J. G. Ray, School of Biosciences, M. G. University	Former faculty members Students and public
17	29/03/19	Farewell party for Dr. Sr Tessa Joseph, HOD.		




H.O.D
 Department of Botany
 Nirmala College, Muvattupuzha

DEPARTMENT OF ECONOMICS
NIRMALA COLLEGE MUVATTUPUZHA
ACADEMIC CALENDER 2015-16

SL No	Proposed Date	Activity	Resource Person	Target Group	Teacher in Charge	Proposed Amount	Approved Amount
1	19 August 2015	Social Outreach Programme		Students - Department of Economics	Deepa Abraham & Meera R		
2	20 August 2015	Association Inauguration	Dr. Murali Vallabhavan, Rtd. Professor, NSS College Vazhoor	Students - Department of Economics	Meera R. & Shaimon Joseph	3000	
3	29 -30 October 2015	National Seminar on Political Economy Of Sustainable Development Of Kerala In The Context Of Gadgil-Kasthoori Rangan Report	UGC	Students - Department of Economics	Meera R. & Shaimon Joseph		
4	9-11 November 2015	Nature camp at chinnar wild life sanctuary		Students - Department of Economics	Shaimon Joseph & Alphonsa K. Joy		
5	30- November 2015	Seminar on current social issue- Penpilai Orumai and Munnar upsurage		Students - Department of Economics	Shaimon Joseph & Alphonsa K. Joy	4000	
6	7 January 2016	Pathway to Success	Sri Thomas muthettu ,trainer	Students - Department of Economics	Deepa Abraham & Meera R	2000	
7	18 January 2016	Inauguration of Reading month	Dr. sanish P B Dept. of Sanskrit ,Nirmala college	Students - Department of Economics	Deepa Abraham & Alphonsa K. Joy		
8	4 March 2016	Budget discussion	Dr. Martin Patric and Dr. Muralidharan s	Students - Department of Economics	Alphonsa K. Joy & Liji George	2500	
9	9 March 2016	Return programme	Mr. Thomas Mathew Parackal	Students - Department of Economics	Shaimon Joseph	2000	

Assignment Submission

I DC I Semester : August 1st to 2nd Week
II DC III Semester : July 2nd to 3rd Week
III DC V Semester : August 1st to 2nd Week
P.G III Semester : August 3rd to 4th Week
P.G I Semester : September 3rd to 4th Semester

Class Tutors

VE : Ms. Liji George
IVE : Ms. Deepa Abraham
IIIE : Dr. J Georgi Neernal
IIE : Ms. Alphonsa K Joy
IE : Mr. Shaimon Joseph

J. Georgi Neernal
HOD



DEPARTMENT OF ECONOMICS
NIRMALA COLLEGE MUVATTUPUZHA

ACADEMIC CALENDER 2016-17

SL No	Proposed Date	Activity	Resource Person	Target Group	Teacher in Charge	Proposed Amount	Approved Amount
1	31 August 2016	Association inauguration	Dr. Muralidharan s	Students - Department of Economics	Ms. Liji George &: Mr. Shaimon Joseph	2000	
2	11 January 2017	Talk on Demonetisation	T C Mathew Editor Deepika	Students - Department of Economics	Shaimon Joseph & Alphonsa K. Joy	2000	
3	12 January 2017	Inauguration of reading month	Sr.Biji M P,Dept. of Malayalam ,Nirmala college	Students - Department of Economics	Deepa Abraham		
4	22 January 2017	Indian economy series	P C Cyriac	Students - Department of Economics	Alphonsa K. Joy&Divya K R	3000	
5	17 February 2017	Budget discussion	Dr. Muralidharan S, Rtd.professor ,Maharajas College Ernakulam	Students - Department of Economics	Alphonsa K. Joy&Divya K	3500	
6	21-22 March 2017	National seminar on Kerala agriculture :opportunities and challenges	Sponsored by Indian council of social science research	Students - Department of Economics	Ms. Liji George &: Mr. Shaimon Joseph		

Assignment Submission

I DC I Semester : August 1st to 2nd Week
 II DC III Semester : July 2nd to 3rd Week
 III DC V Semester : August 1st to 2nd Week
 P.G III Semester : August 3rd to 4th Week
 P.G I Semester : September 3rd to 4th Semester

Class Tutors

VE : Ms. Liji George
 IVE : Ms. Deepa Abraham
 III E : Dr. J Georgi Neernal
 II E : Ms. Alphonsa K Joy
 I E : Mr. Shaimon Joseph



DEPARTMENT OF ECONOMICS
NIRMALA COLLEGE MUVATTUPUZHA

ACADEMIC CALENDER 2017-18

SL No	Proposed Date	Activity	Resource Person	Target Group	Teacher in Charge	Proposed Amount	Approved Amount
1	3 August 2017	Association Inauguration and a Talk on GST	Dr. A. Philip, Associate Professor, Dept. of Commerce, Newman College, Thodupuzha	Students - Department of Economics	Ms. Liji George & Mr. Shaimon Joseph	2000	
2	3 November 2017	Honouring Ceremony of Octogenarians	Dr. Joy Elamon, Director, Kerala Institute of Local Administration, Thrissur	Students - Department of Economics	Ms. Liji George & Mr. Shaimon Joseph	3500	
3	1 st to 31 st January 2018	Reading Month, Programme to promote reading habit	Sr.Biji M.P. Dept. of Malayalam, Nirmala College, Muvattupuzha	Students - Department of Economics	Deepa Abraham		
4	14 February 2018	Budget Discussion	Sri. T. C. Mathew, Editor Deepika	Students - Department of Economics	Alphonsa K Joy & Divya K R	2500	
5	26 February 2018	Life Guidance Programme- 'Unmeelanam'	Dr. Anoopkumar K.V., Psychologist, Wellness, Hospital Ernakulam	Students - Department of Economics	Deepa Abraham	3000	

Assignment Submission

I DC I Semester : August 1st to 2nd Week
 II DC III Semester : July 2nd to 3rd Week
 III DC V Semester : August 1st to 2nd Week
 P.G III Semester : August 3rd to 4th Week
 P.G I Semester : September 3rd to 4th Semester

Class Tutors

V E : Ms. Liji George
 IV E : Ms. Deepa Abraham
 III E : Dr. J. Georgi Neernal
 II E : Ms. Alphonsa K Joy
 I E : Mr. Shaimon Joseph

(Handwritten Signature)
#100



DEPARTMENT OF ECONOMICS

NIRMALA COLLEGE MUVATTUPUZHA

ACADEMIC CALENDER 2018-19

SL No	Proposed Date	Activity	Resource Person	Target Group	Teacher in Charge	Proposed Amount	Approved Amount
1	6 September 2018	Association inauguration and a talk on 'Mullaperiyar Issue'	Adv. Razal Joy	Students - Department of Economics	Shaimon Joseph and Liji George	2500	
2	1 st to 31 st January 2019	Reading Month, Programme to promote reading habit	Dr.Saneesh PB.Dept. of Sankrit,Nirmala College,Muvattupuzha	Students - Department of Economics	Divya K.R &Deepa Abraham		
3	21 st January 2019 :	rEturn Programme, Motivational Talk by Alumni	Mr. Thomas Mathew Parackal	Students - Department of Economics	Shaimon Joseph and Liji George	3500	
4	14 th February 2019	Budget Analysis	Sri T.C Mathew, Senior Associate Editor, Deepika	Students - Department of Economics	Alphonsa K Joy	3000	
5	18 st February 2019	Pathway to Success, <i>Career Guidance Programme</i>	Sri Thomas muzhuthettu ,trainer	Students - Department of Economics	Alphonsa K Joy	3000	

Assignment Submission

I DC I Semester : August 1st to 2nd Week
 II DC III Semester : July 2nd to 3rd Week
 III DC V Semester : August 1st to 2nd Week
 P.G III Semester : August 3rd to 4th Week
 P.G I Semester : September 3rd to 4th Semester

Class Tutors

VE : Mr. Shaimon Joseph
 IVE : Ms. Deepa Abraham
 III E : Dr. J Georgi Neernal &Meera R
 II E : Ms Meera R & Merin Abraham
 I E : Ms. Liji George & Divya KR

Handwritten signature



DEPARTMENT OF ECONOMICS

NIRMALA COLLEGE MUVATTUPUZHA

ACADEMIC CALENDER 2019-20

SL No	Proposed Date	Activity	Resource Person	Target Group	Teacher in Charge	Proposed Amount	Approved Amount
1	5-07-2019	Association Inauguration and Department Merit day celebrations	Dr Vishaka Varma	Students and Teachers ,Department of Economics	Shaimon Joseph and Liji George	3000	
2	16-07-2019	Social Outreach Programme		Inmates of Providence Home	Deepa Abraham & Meera R		
3	06-08-2019	Unmeelanam-Life Guidance Programme	Jaison George	Students - Department of Economics	Meera R & Liji George	2000	
4	21-8-2019	Indian Economy Lecture series	Dr.Tojo Jose Assistant Professor, Govt. College ,Manimalakunnu	Students - Department of Economics	Divya K.R & Merin Abraham	2000	
5	25-26 Sep 2019	National Seminar on Trends in Fiscal Federalism in India	ICSSR (proposed funding agency)	Teachers, Research Scholars &students	Meera R. & Shaimon Joseph	1 Lakh	
6	16- 10 2019	Return Programme- A platform for Interaction with Prominent Alumni	Jeethu Joseph – Film Director/ Dr. Mary George ,Senior Economist	Students - Department of Economics	Liji George & Deepa Abraham	5000	
7	6-8 Nov 2019	Nature Camp		Students - Department of Economics	Shaimon Joseph &Deepa Abraham		
8	3 rd December	Pathway to Success	Georgekutty Joy, Motivation Speaker	Students - Department of Economics	Meera R. & Deepa Abraham	2500	
9	1-Jan 2020	Inauguration of Reading Month		Students - Department of Economics	Divya K.R & Merin Abraham	1000	
10	10 th February 2020	Budget Discussion	Dr. Muraleedharan S., Professor (Rtd), Maharajas College, Ernakulam	Students - Department of Economics	Liji George & Merin Abraham	5000	

Class Tutors

V E : Mr. Shaimon Joseph
IV E : Ms. Deepa Abraham
III E : Dr. J Georgi Neernal & Meera R
II E : Ms Meera R & Merin Abraham
I E : Ms. Liji George & Divya KR

Internal Exam In charge : Deepa Abraham

IQAC In charge : Shaimon Joseph

Association In charge : Meera R

Shaimon Joseph
HOD





NIRMALA COLLEGE, MUVATTUPUZHA
TEACHER PERFORMANCE RECORD
2017 - 2018

Name: _____

Department: _____

Address: _____

PIN: _____

Tel: Mob: _____

E-mail: _____





TEACHER'S PRAYER

*Help me to remember that I am shaping
The lives of tomorrow's generation.
Please give me strength to be the best model.
And the best example that I can possibly be.
Give me love to overcome adversity
And patience to overcome trials.
Give me wisdom to overcome my shortcomings
And faith to overcome dark hours
And, as I find my rest tonight, help me to love my students
And to remember them in my prayers
Give me strength to be equal to tomorrow's task
For I depend on your strength
Just as my students depend on me.*





TEACHER'S CREED

I believe that my students shall pass through my classes but once. If there is anything, therefore, that I can do to help them live useful lives, let me not delay it nor neglect it... for they shall not pass my way again.

OBJECTIVES OF THE TEACHER'S PERFORMANCE RECORD

- 1.To record honestly every curricular / co-curricular activity of a teacher
- 2.To record details of students under tutorial system.
- 3.To record the teaching plan of the teacher
4. To subject the teacher for the performance based appraisal



WORK LOAD OF A TEACHER AS PER UGC GUIDELINES

No.	Activity	NON-LABORATORY SUBJECTS Average number of Hours per week	LABORATORY SUBJECTS Average number of Hours per week
1	Teaching	16	16
2	Test Papers	2	2
3	Tutorials	4	4
4	Preparation of Teaching	10	10
5	Supervision of Academic Work	4	4
6	Administration	4	2
7	Laboratory and Preparation		2
	Total	40 Hours	40 Hours

TIME TABLE - ODD SEMESTER

Day	Tutorial	1	2	3	Tutorial	4	5	Tutorial
I								
II								
III								
IV								
V								

TIME TABLE - EVEN SEMESTER

Day	Tutorial	1	2	3	Tutorial	4	5	Tutorial
I								
II								
III								
IV								
V								

PERSONAL DATA 2017-18

1	Name			
2	Designation			
3	Residential Address			
4	Date of Birth			
5	Date of Joining			
6	Date of Promotion to the present post			
7	Academic Qualifications			
8	Research: (a) Title of the Thesis, (b) University No. and date of the Uty. Order	M.Phil	PhD	
	(d) Research Guidance.	No. of Ph.Ds produced.		Ongoing
9	Research Projects: (a) Title of the Major / Minor Project	Period of the project	Approved amount	Funding agency
10	Publications	No. of books	No. of Research Publications	
11	Workshops or Seminars (National or International) (a) No. of Seminars or workshops	Attended	Papers presented	Organized
12	No. of Orientation / Refresher Courses attended			

THE TEACHER PERFORMANCE RECORD (TPR)

Item	Activity	Nature of work
Unit I: Lecture/ Practical (L/P)	Classroom teaching, practical, extension work if it is an integral part of the course	L/P may be entered in short form, eg: code - class - hours = L - C1 - 2
Unit II : Tutorial (TU):	Supervision of students, field work and guidance of students project work, assignment, internal examination	Assignments Guiding students in project work
Unit III : Extension (ET):	Administration, participation in extra-curricular and institutional supporting activities, monitoring learner progression, monitoring other learning processes, Board of Studies	Contribution to the students for academic / cultural / social activities Conducting extra classes Organizing seminar / conference / workshops Attending workshop related to curriculum design Conducting discussions / debates Career oriented coaching Contribution in curriculum design Contribution in administrative activities Conducting /Visit various camps Motivating students for higher courses/ competitive exams /jobs Visit Research dept./industries Conducting mock viva / interview Conducting programs (academic / cultural / social activities) Remedial Coaching Setting up new syllabus for advanced topics
Unit IV: Examination (Ex.):	Setting Question papers, attending Board of Exams, Evaluation and invigilation works of university Examinations.	Conducting Quiz Evaluating university exam / practical / theory / viva Evaluation papers / Setting Question Papers Conducting seminar in class Evaluating Seminars
Unit V : Research (RE):	Own research work, sanctioned project work, extension Activity, Consultancy, guidance to research Scholars	Participation seminar/ conference / workshop Presentation papers in seminar/ conference/ workshop Publishing papers / conference/journals Preparation of publication work Guiding research work Own Research work
Unit VI: Preparation (PR):	Lesson planning, Library reference, laboratory Work Preparation of study materials, Designing Audio-Video teaching aids, consultation with other Scholars	Preparation for informative method PowerPoint presentation Preparation for Quiz- Questions

1) Please enter No. of Hours for Units II to VI.

2) Please make regular entries in your work record for better convenience and greater accuracy.

3) Please mention the working day (W) / Holiday (H)/nature of Leave (L) in the remarks column. 4) Please ensure that all entries are supported by necessary document.

PROPOSED SCORES FOR ACADEMIC PERFORMANCE INDICATORS (APIs) IN RECRUITMENTS AND CAREER ADVANCEMENT SCHEME (CAS) PROMOTIONS OF UNIVERSITY/ COLLEGE TEACHERS

0.0.1 CATEGORY I: TEACHING, LEARNING AND EVALUATION RELATED ACTIVITIES

S.L No.	Nature of Activity	Maximum Score
1	Lectures, seminars, tutorials, practicals, contact hours undertaken as percentage of lectures allocated*	50
2	Lectures or other teaching duties in excess of the UGC norms	10
3	Preparation and Imparting of knowledge/ instruction as per curriculum; syllabus enrichment by providing additional resources to students ²⁰	20
4	Use of participatory and innovative teaching-learning methodologies; updating of subject content, course improvement etc.	20
5	Examination duties (Invigilation; question paper setting, evaluation/ assessment of answer scripts) as per allotment	25
	Total Score	125
	Minimum API Score Required	75

Note*: Lecture and tutorials allocation add up to the UGC norm for particular category of teacher. University may prescribe minimum cut-off (net due leaves), say 80 percent for 1 and 5 above, below which no scores may be assigned in these sub-categories.

0.0.2 CATEGORY II: CO-CURRICULAR, EXTENSION AND PROFESSIONAL DEVELOPMENT RELATED ACTIVITIES

S.L No.	Nature of Activity	Maximum Score
1	Student related co-curricular, extension and field based activities (such as extension work through NSS/NCC and other channels, cultural activities, subject related events, advices and counselling)	20
2	Contribution to Corporate life and management of the department and institution through participation in academic and administrative committees and responsibilities.	15
3	Professional Development activities (such as participation in seminars, conferences, short term training courses, talks, lectures, membership of association, dissemination and general articles, not covered in Category III below)	15
	Minimum API Score Required	15

0.0.3 CATEGORY III: RESEARCH AND ACADEMIC CONTRIBUTIONS

Sl No	APIs	Faculties of Languages Arts/Humanities/ Social Sciences/ Library/ Physical Education /Management	Max.points for University and college teacher position
III(A)	Research Papers publish in:	Refereed Journals*	15/publication
		Non-refereed but recognized and reputable journals and periodicals, having ISBN/ISSN numbers	10/publication
		Conference proceedings as full papers, etc. (Abstracts not to be included)	10/publication
III(B)		Research Publications (books, chapters in books other than refereed journal articles) Text or Reference Books Published by International Publishers with an established peer review system	50/sole author; 10/chapter in an edited book
		Subjects Books by National level publishers/ State and Central Govt. Publications with ISBN/ISSN numbers	25/sole author, and 5/chapter in edited books
		Subject Books by Other local publishers with ISBN/ISSN numbers	15/sole author, and 3/chapter in edited books
		Chapters contributed to edited knowledge based volumes published by International Publishers	10/Chapter
		Chapters in knowledge based volumes by Indian/ National level publishers with ISBN/ISSN numbers and with numbers of national and international directories	5/Chapter
III(C)	RESEARCH PROJECTS		
III(C)i	Sponsored Projects carried out/ ongoing	Major Projects amount mobilized with grants above 5.0 lakhs	20/each Project
		Major Projects amount mobilized with minimum of Rs.3.00 lakhs up to Rs. 5.00 lakhs	15/each Project
		Minor Projects (Amount mobilized with grants above Rs.25, 000 up to Rs. 3 lakhs)	10/each Project
III(C)(ii)	Consultancy projects carried out/ongoing	Amount mobilized with minimum of Rs.2.0 lakhs	10 per every Rs.10.0 lakhs and Rs.2.0 lakhs, respectively
III(C)(iii)	Completed projects Quality Evaluation	Completed project report (Accepted by funding agency)	20/each major project and 10/each minor project
III(C)(iv)	Projects Outcome/ Outputs	Major Policy document of Govt. Bodies at Central and State level	30/each national level output or patent and 50/each for International level

III (D) RESEARCH GUIDANCE			
III (D)(i)	M.Phil.	Degree awarded only	3/each candidate
III (D)(ii)	Ph.D	Degree awarded	10/each candidate
		Thesis submitted	7/each candidate
III (E) TRAINING COURSES AND CONFERENCE/SEMINAR/WORKSHOP PAPERS			
III(E) (i)	Refresher courses, Methodology	(a) Not less than two weeks duration	20/each
III(E) (ii)	Workshops, Training, Teaching-Learning-Evaluation Technology Programmes, Soft skills development Programmes, Faculty Development Programmes (Max: 30 points)	(b) One week duration	10/each
III (E) (iii)	Papers in Conferences/ Seminars/ workshops etc.**	Participation and Presentation of research papers (oral/poster) in Participation and Presentation of research papers (oral/poster) in	
		a) International conference	10 each
		b) National	7.5/each
		c) Regional/State level	5 /each
		d) Local-University/College level	3/each
III (E) (iv)	Invited lectures or presentations for conferences/ symposia	(a) International	10/each
		(b) National level	5

*Wherever relevant to any specific discipline, the API score for paper in referred journal would be augmented as follows: (i) indexed journals- by 5 points; (ii) papers with impact factor between 1 and 2 by 10 points; (iii) papers with impact factor between 2 and 5 by 15 points; (iv) papers with impact factor between 5 and 10 by 25 points. **If a paper presented in Conference/Seminar is published in the form of Proceedings, the points would accrue-for the publication (III) (a) and not under presentation (III) (e)(ii).

1-15 JUNE 2017

WORKING HOURS

Date & Day	8.45 - 9.45 AM	9.45 - 10.45 AM	10.45 - 11.45 AM	11.45 - 12.45 AM
1 THU				
2 FRI				
3 SAT				
4 SUN				
5 MON				
6 TUE				
7 WED				
8 THU				
9 FRI				
10 SAT				
11 SUN				
12 MON				
13 TUE				
14 WED				
15 THU				

**Total No. of
hours spent for:**

Lecture

Practical

Tutorial

Extension

**Signature
of the Teacher**

**Signature
of the HOD**



SELF APPRAISAL REPORT



**INTERNAL QUALITY ASSURANCE CELL
NIRMALA COLLEGE, MUVATTUPUZHA**

**PROFORMA FOR THE ANNUAL SELF-ASSESSMENT FOR
PERFORMANCE BASED APPRAISAL SYSTEM (PBAS)**

(To be completed and submitted at the end of each academic year)

Session / Year: 2017-18

Part A: GENERAL INFORMATION and ACADEMIC BACKGROUND

- 1 Name (in Block Letters):
- 2 Father's/Mother's Name:
- 3 Department:
- 4 Current Designation & Grade Pay:
- 5 Date of Last Promotion
- 6 Which position and Grade pay are you an applicant under CAS?
- 7 Date of Eligibility for Promotion:
- 8 Date and Place of Birth:
- 9 Sex:
- 10 Marital Status:
- 11 Nationality:
- 12 Indicate whether belongs to SC/ST/OBC category:
- 13 Address for correspondence (with Pin code)
- 14 Permanent Address (with pin code)

Telephone Number:

e-mail:

15. Academic Qualifications (Matric till post-graduation):

Examinations	Name of the Board/University	Year of Passing	Percentage of marks obtained	Division/Class/Grade	Subject
High School/ Matric					
Intermediate					
B.A./B. Sc/ B.Com/ B. Mus					
M.A./M. Sc/ M.Com/ M. Mus					
Other examination, if any					

16. Research Degree

Degrees	Title	Date of award	University
M. Phil			
Ph. D/ D. Phil			
D. Sc/ D. lit			

17. Appointments held prior to joining this institution

Designation	Name of the Employer	Date of		Salary with grade	Reason of Leaving
		Joining	Leaving		

18. Posts held after appointment at this institution:

Designation	Department	Date of Actual Joining		Grade / Salary
		From	To	

19. Period of teaching experience at PG level (in years) UG level (in years)
20. Research experience excluding years spent for M. Phil/ Ph. D (in years)
21. Fields of Specialization under the subject/ Discipline
- a)
- b)
22. Academic Staff College Orientation/ Refresher Course attended

Name of the Course/ Summer School	Place	Duration	Sponsoring Agency
--------------------------------------	-------	----------	-------------------

GUIDELINES FOR FILLING UP PART B

Part B of the Application Form is based on Appendix-III, Table 1 of the UGC Regulations - 2010, 2013.

For each category, even though several avenues of activities and their API scores are given to provide choice/opportunity to the teacher, the maximum limit of scores that can be given or carried forward under the respective category is indicated at the respective place.

The self-assessment scores are subject to verification by the Screening/Verification Committee or Selection Committee of the University.

CATEGORY I : TEACHING, LEARNING AND EVALUATION RELATED ACTIVITIES

- I.1** Lecture/Seminars/Practicals/Tutorials/Contact classes taken should be based on verifiable records. No score should be assigned if a teacher has taken less than 80% of the assigned classes. Universities may give allowance for periods of leave where alternative teaching arrangements have been made.
Maximum score of 50 if there is 100% performance.
- I.2** If a teacher has taken classes exceeding UGC norm, two points to be assigned for each extra hour of classes/credit
Maximum score of 10 if there is 100% performance.
- I.3** Imparting of knowledge/instruction as per curriculum with the prescribed material (Text book/Manual etc)Max Score: 10Syllabus enrichment by providing additional resources to students
(100% compliance = Max Score : 20

Indicators/Activities	Maximum Score
Updating of courses, design of curriculum,	10
Participatory and innovative teaching-learning process with materials for problem based learning, case studies, group discussions etc.	10
Use of ICT in Teaching-Learning process with computer aided methods like PowerPoint / Multimedia/Simulation/Software etc., (Use of any one of these in addition to Chalk and Board: 5 points)	10
Developing and imparting Remedial/Bridge Courses (Each activity: 5 points)	10
Developing and imparting soft skills/communication skills/personality development courses/modules (Each activity : 5points)	10
Developing and imparting specialized teaching-learning programmes in physical education, library; innovative compositions and creations in music, performing and visual arts and other traditional areas (Each activity : 5points)	10
Organising and conducting of popularization programmes/training courses in computer assisted teaching/web-based learning and e-library skills to students (a) Workshop /Training course : 10 points each (b) Popularization program : 5 points each	10
Maximum Aggregate Limit	20

I.5 Examination Related Work

Indicators	Max. score
College/University end semester/Annual Examination work as per duties allotted. (Invigilation – 10 points; Evaluation of answer scripts – 5 points; Question paper setting – 5 points). (100% compliance = 20)	20
College/University examination/Evaluation responsibilities for internal/continuous assessment work as allotted (100% compliance = 10 points)	10
Examination work such as coordination, or flying squad duties etc. (maximum of 5 or 10 depending upon intensity of duty) (100% compliance = 10 points)	10
Maximum Aggregate Limit	25

CATEGORY II : CO-CURRICULAR, EXTENSION AND PROFESSIONAL DEVELOPMENT RELATED ACTIVITIES

II.1 Co-curricular, extension and field based activities Indicators

Indicators	Max. score
a. Institutional Co-curricular activities for students such as field studies/educational tours, industry – implant training and placement activity (5 points each)	10
b. Positions held/Leadership role played in organization linked with Extension Work and National Service Scheme (NSS), NCC, NSO or any other similar activity (Each activity 10 points)	10
c. Students and Staff Related Socio-cultural and Sports Programmes, Campus Publications (Departmental level 2 points each, University/College level 5 points each)	10
d. Community work such as values of National Integration, Environment democracy, socialism, Human Rights, peace, scientific temper; flood or, drought relief, small family norms etc. (5 points each)	10
Maximum Aggregate Limit	20

II.2 Contribution to Corporate Life and Management of the Institution

Indicators	Max. score
a. Contribution to Corporate life in University/ College through meetings, popular lectures, subject related events, articles in college magazine and University volumes (2 points each)	10
b. Institutional Governance responsibilities like, Dean, Director, HOD, Warden, IQAC Director/Co-coordinator, Promotor, Coordinator SSA or any other additional responsibility etc(10 points each)	10
c. Participation in committees concerned with any aspect of departmental or institutional management such as admission committee, campus development, library committee etc(5 points each)	10
d. Responsibility for, or participation in committees for Students Welfare, Counselling and Discipline (5 points each)	10
Maximum Aggregate Limit	15

II. 3 Professional Development Related Activities

Indicators/ Activities	Max. score
a. Membership in profession related committees at state and national level i) At national level : 3 points each ii) At state level : 2 points each	10
b. Participation in subject associations, conferences, seminars without paper presentation (Each activity : 2 points)	10
c. Participation in short term training courses of less than one week duration in educational technology, curriculum development, professional development, examination reforms, institutional governance (Each activity : 5 points)	10
d. Membership / participation in State / Central Bodies / Committees on Education, Research and National Development (Each activity: 5 points)	10
e. Publication of articles in newspapers, magazines or other publications (not covered in category 3); radio talks; television programmes etc.(Each activity: 1 point)	10
Maximum Aggregate Limit	15

CATEGORY-III: RESEARCH AND ACADEMIC CONTRIBUTIONS

This is to be rolled as per Appendix III Table-I, Category III of the UGC Regulations 2010. The API score for paper in refereed journal would be augmented as follows: (i) indexed journals – by 5 points; (ii) papers with impact factor between 1 and 2 by 10 points; (iii) papers with impact factor between 2 and 5 by 15 points; (iv) papers with impact factor between 5 and 10 by 25 points.

If a paper presented in Conference/Seminar is published in the form of Proceedings, the points would accrue for the publication III (a) and not under presentation III (f)(ii).

The API for joint publications will have to be calculated in the following manner: Of the total score for the relevant category of publication by the concerned teacher, the First/Principal author and the corresponding author/supervisor/mentor of the teacher would share equally 60% of the total points and the remaining 40% would be shared equally by all other authors.

**PART B : API SCORE INDICATORS/SELF-ASSESSMENTS FOR
CATEGORIES I, II AND III**

**APPLICABLE FOR ASSOCIATE PROFESSOR AND ASSISTANT
PROFESSOR ONLY**

**API SELF-ASSESSMENT PROFORMA ON PERFORMANCE-BASED APPRAISAL SYSTEM
(to be submitted by every applicant as per UGC Regulations - 2010, 2013)**

Minimum API Score Required for Direct Recruitment of Professor	Consolidated API score of 400 Points from Category III of API
Minimum API Score Required for Direct Recruitment in Associate Professor	Consolidated API Score of 300 Points from Category III of API

**CATEGORY I :
TEACHING, LEARNING AND EVALUATION RELATED ACTIVITIES**

***Explanation :** Based on the teacher's self-assessment, API scores are proposed for*

(a) Teaching related activities;

(b) Domain knowledge;

(c) Participation in examination and evaluation;

(d) Contribution to innovative teaching, new courses etc.

The minimum API score required by teachers from this category is 75. The self assessment score should be based on objectively verifiable criteria wherever possible and will be finalized by the screening/selection committee.

Sl. No	Nature of Activity	Max. admissible Score	#Self-assessment Score (to be filled by applicant)	Verified API Score (for official use)
1	Lectures, seminars, tutorials, practicals, contact hours undertaken taken as percentage of lectures allocated	50		
2	Lectures or other teaching duties in excess of the UGC norms	10		
3	Preparation and Imparting of knowledge instruction as per curriculum; syllabus enrichment by providing additional resources to students	20		
4	Use of participatory and innovative teaching learning methodologies; updating of subject content, course improvement etc.	20		
5	Examination duties (Invigilation; question paper setting, evaluation/ assessment of answer scripts) as per allotment.	25		
	Total Score	125		
	Minimum API Score Required	75		

See : Guidelines for filling up Part B”; supporting data to be entered in Part C

(Signature of the teacher)

**CATEGORY II :
CO-CURRICULAR, EXTENSION AND PROFESSIONAL
DEVELOPMENT RELATED ACTIVITIES**

Explanation: Based on the teacher's self-assessment, category II API scores are proposed for co-curricular and extension activities; and Professional development related contributions. The minimum API required by Candidate for eligibility is 15. A list of items and proposed scores is given below. It will be noticed that all Candidates can earn scores from a number of items, whereas some activities will be carried out only by one or a few Candidates. The list of activities is broad enough for the minimum API score required (15) in this category to accrue to all Candidates. As before, the self-assessment score should be based on objectively verifiable criteria and will be finalized by the screening/selection committee.

Sl. No.	Nature of Activity	Max. admissible Score	#Self-assessment Score (to be filled by applicant)	Verified API Score (for official use)
1	Student related co-curricular, extension and field based activities (such as extension work through NSS / NCC and other channels, cultural activities, subject related events, advisement and counselling)	20		
2	Contribution to Corporate life and management of the department and institution through participation in academic and administrative committees and responsibilities.	15		
3	Professional Development activities (such as participation in seminars, conferences, short term, training courses, talks, lectures, membership of associations, dissemination and general articles, not covered in Category III below)	15		
	Total Score	50		
	Minimum API Score Required	15		

See : Guidelines for filling up Part B”; supporting data to be entered in Part C

(Signature of the teacher)

**CATEGORY-III:
RESEARCH AND ACADEMIC CONTRIBUTIONS**

Explanation: Based on the candidate's self-assessment, API scores are proposed for research and academic contributions. The minimum API score required by candidate from this category is different for different levels of post. The self-assessment score will be based on verifiable criteria and will be finalized by the screening/selection committee.

Sl. No.	Contributions qualifying for API	Sciences	Languages/Arts/ Humanities/Social Sciences	API Scores			
				Max admissible	As per self-assessment	Verified API score	
III (A)	Research Papers (in Journals, Conf. Proceedings etc.)	Total number of papers in Refereed Journals = N		15/paper	$N \times 15 =$		
		*Papers in indexed journals, out of $N = N_1$		5/paper	$N_1 \times 5 =$		
		*Papers with impact factor between 1 and 2, out of $N = N_2$		10/paper	$N_2 \times 10 =$		
		*Papers with impact factor between 2 and 5, out of $N = N_3$		15/paper	$N_3 \times 15 =$		
		*Papers with impact factor between 5 and 10, out of $N = N_4$		25/paper	$N_4 \times 25 =$		
		*Papers in non-refereed, but recognized and reputable journals/periodicals, having ISBN/ISSN numbers, out of $N = N_5$		10/paper	$N_5 \times 10 =$		
		*Papers as full papers in Conference proceedings, etc. (Abstracts not to be counted) = N_6		10/paper	$N_6 \times 10 =$		
		Total of III (A)					
		API Cap for III (A) = 30% of total verified API score in Category III					

**Wherever relevant to any specific discipline, the API score for paper in refereed journal are to be augmented as follows: (i) indexed journals -- by 5 points; (ii) papers with impact factor between 1 and 2 -- by 10 points; (iii) papers with impact factor between 2 and 5 -- by 15 points; (iv) papers with impact factor between 5 and 10 -- by 25 points.*

**If a paper presented in Conference/Seminar is published in the form of Proceedings, the API score points would accrue for the publication under III (A) and not under III (E)(ii).*

**API scores for joint publications are to be calculated in the following manner : Of the total score for the relevant category of publication by the concerned teacher, the first/Principal author and the corresponding author/supervisor/mentor of the teacher would share equally 60% of the total points and the remaining 40% would be shared equally by all other authors.*

Sl. No.	Contributions qualifying for API	Sciences	Languages/Arts/ Humanities/Social Sciences	API Scores		
				Max admissible	As per self-assessment	Verified API score
III (B)	Research Publications (books, chapters in books, other than refereed journal articles)	Text or Reference Books Published by International Publishers with an established peer review system a)No. of sole author book(s) = M_1 b)No. of chapter(s) in edited book(s) = M_2	50 /sole author book; 10/Chapter in an edited book	$M_1 \times 50 =$ $M_2 \times 10 =$		
		Subjects Books by National level publishers/ State and Central Govt. Publications with ISBN/ ISSN numbers a) No. of sole author book(s) = M_3 b) No. of Chapter(s) in edited book(s) = M_4	25 /sole author; 5/Chapter in an edited book	$M_3(5) \times 25 =$ $M_4(13) \times 5 =$		
		Subject Books by other local publishers with ISBN/ ISSN numbers a)No. of sole author book(s) = M_5 b)No. of Chapter(s) in edited book(s) = M_6	15 /sole author book; 3/Chapter in edited book	$M_5(1) \times 15 =$ $M_6 \times 3 =$		
		Chapters contributed to edited knowledge based volumes published by International Publishers No. of Chapter(s) = M_7	10/Chapter	$M_7 \times 10 =$		
		Chapters in knowledge based volumes by Indian/ National level publishers with ISBN/ISSN numbers & with numbers of national & international directories No. of Chapter(s) = M_8	5/Chapter	$M_8 \times 5 =$		
		Total of III (B)				
		API Cap for III (B) = 25% of total verified API score in Category III				

III (C) RESEARCH PROJECTS (Max. Score: 20 % of the total verified API score in Category III)						
Sl. No.	APIs	Sciences	Languages/ Arts / Humanities / Social Sciences	Max. points for University teacher position		
				API Score allotted	Self appraisal Score	Verified API Score
III (C) (i)	Sponsored Projects carried out/ ongoing	Major Projects -- amount mobilized with grants :		20 / Project	$P_1(1) \times 20 =$	
		above 30 lakhs : No. of Project(s) = P_1	above 5 lakhs : No. of Project(s) = P_1			
		Major Projects -- amount mobilized with grants		15 / Project	$P_2 \times 15 =$	
		above 5 lakhs up to 30 lakhs : No. of Project(s) = P_2	Min. Rs. 3 lakhs up to Rs. 5 lakhs : No. of Project(s) = P_2			
		Minor Projects -- amount mobilized with grants		10 / Project	$P_3(3) \times 10 =$	
above Rs. 50,000 up to Rs. 5 lakhs : No. of Project(s) = P_3	above Rs. 25,000 up to Rs. 3 lakhs : No. of Project(s) = P_3					
III (C) (ii)	Consultancy Projects carried out / ongoing	Amount mobilized with		10/ every Rs.10 lakhs and Rs.2 lakhs respectively	$R \times 10 =$	
		min. of Rs.10 lakhs : No. of projects = R	min. of Rs.2 lakhs : No. of projects = R			
III (C) (iii)	Completed projects : Quality Evaluation	Completed project ; Report accepted by funding agency		20/major project	$Q_1(2) \times 20 =$	
		No. of completed & accepted Major project (s) = Q_1				
		No. of completed & accepted Minor project(s) = Q_2		10/ minor project	$Q_2(2) \times 10 =$	
III (C) (iv)	Projects Outcome / Outputs	Patent/Technology transfer/Product / Process	Major Policy document of Govt. Bodies at Central and State Level	output or patent	$O_1 \times 30 =$ $O_2 \times 50 =$	
		No. of national level output = O_1		30 /natl.level		
		No. of international level output = O_2		50/intl. level		
		Total of III (C)				
API Cap for III (C) = 20% of total verified API score in Category III						

(Signature of the teacher)

III RESEARCH GUIDANCE						
(D) Max. Score: 10 % of the total verified API score in Category III)						
Sl. No.	APIs	Sciences	Languages/ Arts / Humanities / Social Sciences	Max. points for University teacher position		
				API Score allotted	Self appraisal Score	Verified API Score
III (D) (i)	M.Phil.	Degree awarded; No. of Candidates = D ₁		3/candidate	D ₁ (2) x 3 =	
III (D) (ii)	Ph.D.	Degree awarded; No. of Candidates = D ₂		10/candidate	D ₂ (3) x 10 =	
		Thesis submitted; No. of Candidates = D ₃		7/ candidate	D ₃ x 7 =	
Total of III (D)						
API Cap for III (D) = 10% of total verified API score in Category III						

(Signature of the teacher)

III TRAINING COURSES AND CONFERENCE /SEMINAR/ WORKSHOP PAPERS						
(E) (Max. Score: 15 % of the total verified API score in Category III)						
Sl. No.	APIs	Sciences	Languages/ Arts / Humanities / Social Sciences	Max. points for University teacher position		
				API Score allotted	Self appraisal Score	Verified API Score*
III (E) (i)	Refresher courses, Methodology workshops, Training, Teaching-Learning-Evaluation Technology Programmes, Soft Skills development Programmes, Faculty Development Programmes	Not less than two weeks duration : No. of Programme(s) = T ₁		20 each	T ₁ (4) x 20 =	
		One week duration ; No. of Programme(s) = T ₂		10 each	T ₂ (1) x 10 =	
III (E) (ii)	Papers in Conferences/ Seminars/ workshops etc. (that are not included in III (A) or III (E) (i & iii))	Participation and Presentation of research papers (oral/poster) in				
		International conference : No. of Papers = C ₁		10 each	C ₁ (1) x 10 =	
		National conference : No. of Papers = C ₂		7.5 each	C ₂ (17)x7.5 =	
		Regional /State level conference : No. of Papers = C ₃		5 each	C ₃ (3) x 5 =	
III (E) (iii)	Invited lectures or presentations for conferences/ symposia	International lecture (s) and/or Presentation(s) = L ₁		10 each	L ₁ (1) x 10 =	
		National lecture (s) and/or Presentation(s) = L ₂		5 each	L ₂ X 5 =	
Total of III(E)						
API Cap for III (E) = 15% of total verified API score in Category III						

(Signature of the teacher)

IV. SUMMARY OF API SCORES

Sl. No.	Criteria	Percentage of Capping on the Cumulative Total of API Category – III (Verified API Score)	Value on the Total API Score after capping
III	Research and Academic Contributions (III)		
III(A)	Research Papers (Journals, etc.)	30%	
III(B)	Research Publications (Books etc.)	25%	
III(C)	Research Projects	20%	
III(D)	Research Guide	10%	
III(E)	Training Courses and Conf./Seminar, etc.	15%	
	Total Score under Category III only		

(Signature of the teacher)

II. Reading/ Instructional material consulted and additional knowledge resources provided to students

Sl. No.	Course/Paper	Consulted	Prescribed	Additional Resource provided
API score based on preparation and imparting of knowledge/ instruction as per curriculum & syllabus enrichment by providing additional resources to students (max score: 20)				

III. Use of Participatory and Innovative Teaching-Learning Methodologies, Updating of Subject Contents, Course Improvement etc.

Sl. No.	Short Description	API Score
Total (max Score: 20)		

**CATEGORY II :
CO-CURRICULAR, EXTENSION AND PROFESSIONAL DEVELOPMENT
RELATED ACTIVITIES**

Please mention your contribution to the following:

Sl. No.	Type of Activity		
	i) Field studies/educational tours	Average Hrs/ week	API Score
	Student -related Socio-cultural and Sports Programmes, Campus Publications (University level 5 points each)		
	Total (max score: 20)		
	ii) Contribution to Corporate Life and management of the Institution		
	Meetings, popular lectures, subject related events, articles in college magazine and University volumes		
	Institutional Governance responsibilities		
	Participation in admission committee, campus development.		
	Total (max score : 15)		
	iii) Professional Development Activities		
	Membership in profession related committees at state and national level At national level : 3 points each At state level : 2 points each		
	Participation in subject associations, conferences, seminars without paper presentation (Each activity : 2 points)		
	Membership / participation in State / Central Bodies / Committees on Education, Research and National Development (Each activity: 5 points)		
	Publication of articles in newspapers, magazines or other publications (not covered in category 3); radio talks; television programmes etc.(Each activity: 1 point)		
	Total (max score : 15)		
	Total (i+ii+iii) (max score : 50)		

(B)(i) Research Publications (Books)

Sl. No.	Title with page no.	Books, Title, Editor & Publisher	ISSN/ISBN No.	Whether peer reviewed? Impact Factor, if any	No. of co-author (s)	Whether you are the main author	API Score

(B)(ii) Books published as sole author or as editor

Sl. No.	Title with page no.	Type of Book & Authorship	Publisher & ISSN/ISBN No.	Whether peer reviewed? Impact Factor, if any	No. of co-author (s)	Whether you are the main author	API Score
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							

(C)(i) Sponsored Projects – Carried out/on-going

Sl. No.	Title	Funding Agency	Period	Amount mobilised in Rs.	API Score
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

(C) (iv) : Projects outcome/output/patent

Sl. No.	Title	Funding Agency	Period	Amount mobilised in Rs.	National/ International level output/ patent	API Score

III (D) Research Guidance

Sl. No.	Number Enrolled	Thesis Submitted	Degree awarded	Supervisor/Jt. Supervisor	API Score

III (E) Training Courses and Conference/Seminar/Workshop/Papers

Sl. No.	Programme	Duration	API Score
III (E) (i)	Refresher courses, training, teaching-learning evaluation, faculty development programmes, etc.		
1.			
2.			
3.			
4.			
5.			
6			
7			
8			
9			
10			
Sl. No.			
III (E) (ii)	Papers in Conferences/Seminars/Workshops not included in III (A) – Participation and presentation of oral/poster paper		
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

III (E) (iii) Invited Lectures/Presentations in Conferences/Symposia

Sl. No.	Title of Conference/ Seminar etc.	National	International	No. of lectures/ presentations	API Score
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

OTHER RELEVANT INFORMATION

Please give details of any other credential, significant contributions not mentioned earlier

Sl. No	Details (Mention Year, value etc. wherever relevant)
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

LIST OF ENCLOSURES: (*Please attach, copies of certificates, sanction orders, papers etc. wherever necessary*)

I certify that the information provided is correct as per records documents enclosed along with the duly filled up API *proforma*.

Signature of the teacher
Designation, Place & Date

I certify that the information provided is correct as per records available with the university and/or documents enclosed along with the duly filled API *proforma*.

Signature of HoD/School Chairperson/Principal
Place & Date

**MAHATMA GANDHI UNIVERSITY
KOTTAYAM**

**PBAS Proforma for promotion under UGC Career Advancement Scheme
For Physical Education Teachers in Colleges
(In accordance with UGC regulations 2010)**

College:

Application for promotion from:

Assistant Professor (Stage 1 to Stage 2 or Stage 2 to Stage 3),
Assistant Professor (Stage 3) to Associate Professor (Stage 4),
Associate Professor (Stage 4 to Professor/equivalent cadres Stage 5)
Professor (Stage 5 to Stage 6).

(Please indicate whichever is applicable)

Period of Assessment for promotion:	From _____ to _____
--	---------------------

1	Name (in Block Letters)	
2	Father's Name/Mother's Name	
3	Nationality	
4	Date and Place of Birth	
5	Sex	
6	Marital Status	
7	Indicate category: SC/ST/OBC /General category	
8	Date and Post of Joining service at College with UO reference PF No:	
9	Date of Last Promotion with Post/Grade promoted to	
10	Current Designation and Grade pay	
11	Which position and grade pay are you an applicant under CAS?	
12	Date of eligibility for promotion	

13	Permanent Address with PINCODE	
14	Address for Communication with PINCODE	
15	Phone numbers (Off. Res. Mob) Email	

16. Academic Qualifications:

Qualification	Subjects/ Specialization/Title	University/ Board	Year of Passing	Date of award	% of marks obtained
Masters Degree					
M.Phil*					
Ph.D.*					
D.Sc./D.Litt.*					
Other Qualifications (if any)					

**In case of M.Phil/Ph.D/ D.Sc/D.Litt., an attested copy of the degree & result notification for the same is to be attached.*

17. Record of Previous Regular Service

Note: Please indicate in a separate sheet attached, whether in previous service has to be counted:

- The essential qualifications of the post held were not lower than the qualifications prescribed by the UGC.
- The post is/was in an equivalent grade or of the pre-revised scale of pay as the post of Assistant Professor, Associate Professor or Professor as the case may be
- Whether applied through proper channel.
- Whether possess the same minimum qualifications as prescribed by the UGC for appointment to the post.
- The post was filled in accordance with the prescribed selection procedure as laid

down in the Regulations of University/State Government/Central Government/Concerned Institution, for such appointments.

- f) The previous appointment was not as guest lecture for any duration, or an ad-hoc or in a leave vacancy of less than one year duration

Details of prior service (Attach relevant experience certificate)

Sl.No.	Institution	Designation	Essential qualifications for the post at the time of appointment	Pay-Scale and Grade	Period	Reasons for Leaving

Details of Service at Present college

Sl.No.	Designation	Essential qualifications for the post at the time of appointment	Pay-Scale and Grade	Period	U.O. Number

18. Post doctoral experience within the country and abroad (please attach separate sheet, if required):

19. Period of teaching Experience:

P.G. Classes (in Years and months)

U.G. Classes (in Years and months)

20. Research Experience excluding years spent in M.Phil /Ph.D.
(in Years and months)

21. Fields of Specialization under the Subject/Discipline

(a)

(b)

22. Orientation/Refresher/Winter/Summer Courses attended *:

Nature of the course/Summer School	Place	Duration	Sponsoring Agency

(*Attach certificate copies)

23. Any other relevant information:

Declaration

I certify that the information provided is correct as per records available with the college and/or documents enclosed along with this filled in Proforma.

Name and Signature

Place: _____

Date: _____

FOR USE BY
Head of the Institution

VERIFIED AND COUNTERSIGNED

Place

Principal of the college

Date:

(Office Stamp)

PART B: ACADEMIC PERFORMANCE INDICATORS

(Please see detailed instructions of this PBAS Proforma before filling out this section)

CATEGORY: I.

TEACHING, COACHING & INFLUENCING SOCIAL COGNITIVE LEARNING RELATED ACTIVITIES

For Category I and II the forms have to be submitted for each year from 1st July 2010 onwards. The average of yearly API scores for Category I and II for the years under consideration from 1st July 2010 shall be taken as the API score for Category I and II for the purpose of CAS. In all cases for Category III only one form for the whole period under consideration for CAS promotion need be submitted.

- (i) **Teaching, coaching, training & coordinating health & recreation related activities for the students (give semester-wise details, where necessary)**

		API Score	Max score 50
(a)	Classes Taken-Average for the year (max 15 for 100% performance & Proportionate Score upto 80% performance, below which no score may be given)		
(b)	Coaching & training (max score:35)		
(c)	Managing other health & recreation related activities (max score 40)		

- (ii) **Extending service to institution, organization & community in excess to norms.**

		API Score	Max score 15
(a)	External assignments for university, state & country		
(b)	Community & institutional service besides norm		

- (iii) **Management & conduct of sporting events at college.**

		API Score	Max score 30
(a)	Conduct of International, national, interuniversity competitions		
(b)	State level competitions		
(c)	Intercollegiate/District competitions (15 per event)		
(d)	University/ state coaching camps		

- (iv) **Use of participatory & innovative teaching/ coaching methodologies & facilities**

		API Score	Max score 20
(a)	Use of ICT for teaching coaching		

(b)	Updating course, design for curriculum	
(c)	Preparation of resource materials, fresh reading materials, training manuals	
(d)	Maintenance of playfield	
(e)	Developing/ assigning/imparting remedial/correctional/bridge/counseling sessions	
(f)	Developing, imparting, and organizing soft skills, psychological skills & personality development programmes for sportsperson	
(g)	Talent identification programme development & conduct	

(v) **Examination related work**

S. No.	Type of Examination Duties	Duties Assigned	API Score	Total Score (Max. 10)
(a)	University examination			
(b)	College examination			
(c)	Other exam works			

CATEGORY: II**CO-CURRICULAR, EXTENSION, PROFESSIONAL DEVELOPMENT RELATED ACTIVITIES**

S. No.	Type of Activity	Average Hrs/week	API Score
(i)	Extension, Co-curricular & Field based activities		
	Total (Max.: 20)		
(ii)	Contribution to Corporate Life and Management of the Institution	Yearly/Semester wise responsibility	API Score
	Total (Max.: 15)		
(iii)	Professional Development Activities		API Score
	Total (Max.: 15)		
	Total Score (i + ii + iii) (Max: 25)		

CATEGORY: III. RESEARCH, PUBLICATIONS AND ACADEMIC CONTRIBUTIONS

A. Published Papers in Journals

S. No.	Details of the Publication - Authors, Title, Name of the Journal , Issue (month and year) and Page nos	ISSN/ ISBN No.	Whether peer reviewed.	International/National /Regional	Impact factor, indexed if any	API score
1						
2						
3						

B. (i) Articles/Chapters published in Books

S. No.	Details of the Publication- Authors, Title, Name of the Book, Issue (month and year) and Page nos	Editor & Publisher and other information	ISSN / ISBN No.	Whether peer reviewed .	Publisher International /National /Regional	API score
1						
2						
3						

B (ii) Full Papers published in Conference Proceedings

S. No.	Details of the Publication- Authors, Title, Page nos	Details of Conference Publication - Title of Conference, Date, Publisher	ISSN / ISBN No.	International /National /Regional	API score
1					
2					
3					

B (iii) Books published as author or as editor

S. No.	Title of the Book, Name of Editir/Author	Type of Book & Authorship, Publisher etc	ISSN / ISBN No.	International /National /Regional	API score
1					
2					
3					

C. Ongoing /Completed Research Projects and Consultancies

C. (i& ii). Ongoing /Completed projects and consultancies

S. No.	Title	Agency	Period	Principal Investigator or Co-PI	Grant/ Amount in (Rs Lakhs)	API Score

C. (iii & iv) Completed Projects/Consultancies

S. No.	Title	Agency	Period	Principal Investigator or Co-PI	Report Accepted / Patent/ Technology transferred	API Score

D. Research/Thesis/Dissertation Guidance

S.No.	Number Enrolled	Thesis Submitted	Degree awarded	API Score
M. Phil				
Ph. D				
P.G				

E. (i) Training courses, teaching-learning-evaluation technology, faculty evaluation technology, faculty development programmes attended

S. No.	Programme	Duration	Organized by	API Score

E. (ii) Papers presented in Conferences, Seminars, Workshops, Symposia

S. No.	Title of the paper Presented	Title of Conference/Seminar	Organised by	International /National /Regional/ Usty or College level	API score
1					
2					

E (iii) Invited Lectures/ Refresher/Orientation course class and Chairmanships at National or International Conference/Seminars

S. No.	Title of Lecture/Academic Session	Title of the Conference/Seminar /Event	Organized by	Class / Talk or Chair	International /National /Regional	API score
1						
2						
3						
4						
5						

OTHER RELEVANT INFORMATION

Please give details of any other significant contributions, awards etc. not mentioned earlier in this Performa.

S.No.	Details (Mention Year, Value etc., where relevant)

Declaracion

I certify that the information provided is correct as per records available with the college and/or documents enclosed along with this filled in Proforma.

Place

Date

Name and Signature of the Candidate

FOR USE BY
Head of the Institution

Specific Remarks if any:

VERIFIED AND COUNTERSIGNED

Place

Principal of the college

Date:

(Office Stamp)

IV. YEARWISE SUMMARY OF PART B: API SCORES FOR CATEGORY I AND II
 (To be filled for each academic year in the assessment Period)

College: _____

Name and Designation of Applicant : _____

Application for promotion from: _____

Period of Assessment for promotion: From _____ to _____
--

Category I: Teaching, coaching & influencing social cognitive learning related activities

Max score allowed:125

Min score required: 75

Sl No	Period/Academic year	Total Score Claimed	Total Score Awarded*

Category II: Co-curricular, Extension, Professional development related activities

Max score allowed:125

Min score required: 25

Sl No	Period/Academic year	Total Score Claimed	Total Score Awarded*

* - To be filled by the screening/selection committee

**V. SUMMARY OF PART B: ACADEMIC PERFORMANCE INDICATORS
(For Use by Screening cum Evaluation/Selection Committee)**

College: _____

Name and Designation of Applicant : _____

Application for promotion from: _____

Period of Assessment for promotion: From _____ to _____

Summary of API Scores

Category	Criteria	Last Academic Year	Total – API score for Assessment Period	Annual Av.API score for Assessment Period
I	Teaching, coaching & influencing social cognitive learning related activities			
II	Co-curricular, Extension, Professional development etc			
	Total I+II			

Category III: Research and Academic contributions for entire Assessment Period

For the period _____ to _____ Min Score required:

Sl No	Nature of Activity	Score Claimed*	Score Awarded
A	Publications in Journals		
B (i)	Publications in Books		
B (ii)	Publications in Conference Proc.		
B (iii)	Books Published		
C (i)& (ii)	Research & Consultancy-Ongoing		
C (iii)&(iv)	Research & Consultancy-Completed		
D	Research Guidance		
E (i)	Training courses, FDP -attended		
E (ii)	Conf. Papers presented only		
E (iii)	Invited talks/ session chair ay Conf.		
	Total Score		

* To be filled by the Candidate

Suggestions & Recommendations:

Name and Signatures of Members

1.

2.

3.

4.

5.

Place:

Date:

Instructions for Filling up PART B ,Category –I, II & III of the PBAS Proforma

- (i) The proforma is to be filled as per the instructions given in tables given below, and self-assessment score given. For each category, even though several avenue of activities and their API scores are given to provide choice / opportunity to the teacher, maximum limit of scores can be given or carried forward under each category / area is indicated in the Table.
- (ii) For Category-I and Category II, for a teacher eligible for CAS promotion in 2010, one year API scores 2009-10 alone will be required for assessment. In case of a teacher being considered for CAS promotion in 2011, two years average of API scores for these categories will be required for assessment and so on leading progressively for the complete assessment period.
- (iii) For Category III detailed information for the entire assessment period is to be provided. In case of promotion to Professor the publication requirement shall be met over the two previous stages.
- (iv) The self-assessment scores are subject to verification by the University / College, and by the Screening Committee cum Verification Committee as the case may be. The minimum academic performance and service requirements are based on Appendix III, Table III of UGC Regulations 2010.
- (v) The candidates should offer themselves for assessment for promotion. If they fulfill the minimum API score they can apply three months before the due date.

Category I: Teaching, coaching & influencing social cognitive learning related activities

Maximum Scores Allocated: 125

Minimum API Scores Required : 75

	Nature of Activity	Max. Score
(i)	Teaching, coaching, training & coordinating health & recreation related activities for the students	
(a)	Teaching Classes Taken-Average for the year (max 15 for 100% performance & Proportionate Score upto 80% performance, below which no score may be given)	15
(b)	Coaching & training	35
(c)	Managing other health & recreation related activities	40
	Maximum aggregate limit	50
(ii)	Extending service to institution, organization & community in excess to norms	
(a)	External assignments for university, state & country	10
(b)	Community & institutional service besides norm	20
	Maximum aggregate limit	15

(iii)	Management & Conduct of sports competition at college	
(a)	Conduct of International, national, interuniversity competitions	30
(b)	State level competitions	15
(c)	Intercollegiate/District competitions (15 per event)	15
(d)	University/ state coaching camps	5
	Maximum aggregate limit	30
(iii)	Use of participatory and innovative teaching, coaching & training methodologies; updating of subject content, facilities, etc.	
	Use of ICT for teaching coaching, web-based learning and e-library skills to students	10
	Updating course, design for curriculum	10
	Preparation of resource materials, fresh reading materials, training manuals	5
	Maintenance of playfield	5
	Developing/ assigning/imparting remedial/ correctional/bridge/counseling sessions	5
	Developing, imparting, and organizing soft skills, psychological skills & personality development programmes for sportsperson	5
	Talent identification programme development & conduct	5
	Maximum Aggregate Limit	20
(iv)	Examination Related Work	
	College/University end semester/Annual Examination work as per duties, allotted. (invigilation – 10 points per duty taken, Evaluation of answer scripts – 5 points/subject/per exam; Question paper setting-3 points/ per subject/exam. 5 points per lab/Viva exam conducted as examiner.) (100% compliance = 25 points)	10
	Maximum Aggregate Limit	10

Category II: Co-Curricular, Extension and Professional Development Related Activities.

Maximum Scores Allocated: 50

Minimum API Score Required: 15

S.No.	Nature of Activity	Max. Score
(i)	Extension and Co-curricular , Extension and Professional Development Related Activities	
	Institutional Co-curricular activities for students such as field studies/educational tours, industry-implant training, Placement etc (5 points	10

	each)	
	Positions held/Leadership role played in organization linked with Extension Work and National service Scheme (NSS), NCC, Employment Bureau or any other similar activity at University level (each activity 10 points). Similar roles at college/Department level will get 3 points.	10
	Students and Staff Related Socio Cultural and Sports Programmes, Campus publications (departmental level 2 points, Institutional level 5 points)	10
	Community work such as values of National Integration, Environment democracy, socialism, Human Rights, peace, scientific temper; flood or, drought relief, small family norms etc. (5 points)	10
	Maximum Aggregate Limit	20
(ii)	Contribution to Corporate Life and Management of the Institution	
	Contribution to Corporate life in Universities/colleges through popular lectures, subject related events, articles in college magazine and University volumes (2 point each)	10
	Institutional Governance responsibilities like Member of Syndicate/ Academic Council/Senate, Registrar, Controller of Examinations, Dean, Director IRAA/CIRM, Chief Warden , IQAC Coordinator, Principal (10 points each)	15
	Departmental level Administrative responsibilities, Head of Dept, Director of School (10 points each) Chief superintendent of exams, Chairman Passing Board/Valuation Camp, Placement Co-ordinator (5 points each) Dept. Council secretary, Member BOS, Member of faculty Admission, Library, Campus development (3 points, Member passing board- 2 points)	10
	Responsibility for, or participation in committees for Students Welfare, Counseling and Discipline (3 points each), Batch co-ordinator-2 points.	10
	Organization of Conference/Refresher/ Training as Chairman/Organizational Secretary/Treasurer: (a) International (10 points) National/regional (5 points) (b) As member of the organizing committee (1 point each)	10
	Maximum Aggregate Limit	15
(iii)	Professional Development Related Activities	
	Membership in profession related committees at state and national level a) At national level : 5 points each b) At state level : 3 points each c) At University Level : 2 Points	10
	Participation in subject associations, conferences, seminars without paper presentation (each activity : 2 points)	10
	Participation in short term training courses less than one week duration in educational technology, curriculum development, professional development, Examination reforms, Institutional governance (each activity : 5 points)	10
	Membership/participation in State/Central Bodies/Other University Bodies Committees on Education, Research and National Development (5 points each)	10
	Publication of articles in newspapers, magazines or other publications (not covered in category III); radio talks; television programmes (1 point each)	10
	Maximum Aggregate Limit	15

Note: For the above Activities wherever activities jointly conducted Principal organizer gets 70% points, Co-organizers share the remaining 30% points from total points allocable if activity performed by a single person.

CATEGORY –III: RESEARCH AND ACADEMIC CONTRIBUTIONS

Brief Explanation: Based on the teacher’s self-assessment, API Scores are proposed for research and academic contributions. The minimum API score required by teachers from this category is different for different levels of promotion. The self-assessment score will be based on verifiable criteria and will be finalized by the screening/selection committee.

Minimum Score Requirement for entire assessment Period

Assistant Professor Stage 1 to 2 :40

Assistant Professor Stage 2 to 3 : 100

Assistant Professor Stage 3 to 4, Associate Professor : 80

Associate Professor Stage 4 to stage 5, Professor : 120

Professor Stage 5 to Professor state 6 : 500

S.N.	APIs	Engineering/Agriculture/ Veterinary Science/Sciences/Medical Sciences	Faculties of Languages Arts/Humanities/Social Sciences/Library/ Physical education/Management	Max. points for University and college teacher position
(A)	Research Papers (Published in Journals)	Refereed Journals*	Refereed Journals*	15 / Publication
		Non-refereed but recognized and reputable journals and periodicals, having ISBN/ISSN numbers	Non-refereed but recognized and reputable journals and periodicals, having ISBN/ISSN numbers	10 / Publication
		Conference proceedings as full papers, etc. (Abstracts not to be included)	Conference proceedings as full papers, etc. (Abstracts not to be included)	10 / Publication
(B)	Research Publications (books, chapters in books, other than refereed journal articles)	Text or Reference Books Published by International Publishers with an established peer review system.	Text or Reference Books Published by International Publishers with an established peer review system.	50/book; 10 /chapter in an edited book
		Subjects Books by National level publishers/State and Central Govt. Publications with ISBN/ISSN numbers	Subjects Books by National level publishers/State and Central Govt. Publications with ISBN/ISSN numbers	25/Book, and 5 / chapter in edited book
		Subject Books by Other local publishers with ISBN/ISSN numbers	Subject Books by Other local publishers with ISBN/ISSN numbers	15 /Book, and 3 / chapter in edited book

		Chapters contributed to edited knowledge based volumes published by International Publisher	Chapters contributed to edited knowledge based volumes published by International Publisher	10 / Chapter
		Chapters in knowledge based Volumes by Indian/National level publishers with ISBN/ISSN numbers and with numbers of national and international directories	Chapters in knowledge based Volumes by Indian/National level publishers with ISBN/ISSN numbers and with numbers of national and international directories	5 / Chapter
C	Research Projects			
C (i)	Sponsored Projects carried out/ ongoing	a) Major Projects amount mobilized with grants above 30.0 lakhs	Major Projects amount mobilized with grants above 5.0 lakhs	20 / each Project
		b) Major Projects amount mobilized with grants above 5.0 lakhs up to 30.0 lakhs	Major Projects amount mobilized with minimum of Rs.3.00 lakhs up to Rs.5.00 lakhs	15 / each Project
		c) Minor Projects (Amount mobilized with grants above Rs. 50,000 up to Rs. 5 lakh)	Minor Projects (Amount mobilized with grants above Rs. 25,000 up to Rs. 3 lakh)	10 / each Project
		d. Proposal Prepared and won for departmental projects like SAP, Special funding Project etc	d. Proposal Prepared and won for departmental projects like SAP, Special funding Project etc	10 per each project proposal
C (ii)	Consultancy Projects carried out / ongoing	Amount mobilized with minimum of Rs.10.00 lakh	Amount mobilized with minimum of Rs.2.00 lakhs	10 points per every Rs.10.0 lakhs and Rs.2.0 lakhs, respectively

C (iii)	Completed projects :	Completed Project Report (Acceptance from funding agency)	Completed project report (Accepted by funding agency)	20 / each major project and 10 / each minor project not covered in anywhere else
C (iv)	Projects Outcome/Outputs	Patent/Technology transfer/ Product Process	Major Policy document of Govt. Bodies at Central and State level	25/ each national level output or patent. 40/each for international level output

D	Research Guidance			
D (i)	M.Phil	Degree Awarded only	Degree Awarded only	3 Points for each candidate
D (ii)	Ph.D	Degree Awarded only	Degree Awarded only	10 Points for each candidate
		Thesis submitted	Thesis submitted	7 Points for each candidate
		Ongoing Guidance of candidates(Except those submitted the thesis) subject to a maximum of 5 marks.	Ongoing Guidance of candidates(Except those submitted the thesis) subject to a maximum of 5 marks.	1 point for each candidate
D (iii)	P.G	Evaluated PG Project/Thesis subject to a maximum of 5 marks.	Evaluated PG Project/Thesis subject to a maximum of 5 marks.	1 point for each candidate
E	TRAINING COURSES AND CONFERENCE / SEMINAR / WORKSHOP PAPERS Attended (Not less than one week duration)			
E(i)	Refresher courses, Methodology workshops, Training, Teaching-Learning-Evaluation Technology Programmes, Soft skills development Programmes, Faculty Development Programmes (Max: 30 points)	(a) Not less than two weeks duration	(a) Not less than two weeks duration	20 points each
		(b) One week duration	(b) One week duration	10 points each
E (ii)	Papers in Conference/ Seminars/ workshops etc.	Participation and Presentation of research papers (oral/poster) in	Participation and Presentation of research papers (oral/poster) in	
		a) International Conference	a) International Conference	10 Points each
		b) National	b) National	7.5 Points each
		c) Regional/State level	c) Regional/State level	5 Points each
		d) Local-University/College level	d) Local-University/College level	3 Points each

E (iii)	Invited lectures or presentations for conferences/ symposia or talks in refresher courses	(a) International	(a) International	10 Points each
		(b) National Level	(b) National Level	5 Points each

Note: **1.** For Publications and paper presentations involving multiple authors, API calculations among the faculty members would be as given: The First/Principal author and the corresponding author/Supervisor/ Mentor would get 60% of the total score and the remaining 40% would be shared equally among the remaining authors. Wherever relevant to any specific discipline, the API score for paper in refereed journal would be augmented as follows: (i) indexed journals – by 5 points; (ii) papers with impact factor between 1 and 2 by 10 points; (iii) papers with impact factor between 2 and 5 by 15 points; (iv) papers with impact factor above 5 by 25 points.

2. For Projects and Consultancy involving multiple persons in Investigator role, API calculations would be as given: Principal Investigator gets 70% of the points, Co-investigators share the remaining 30% of the points.

3. If a paper presented in Conference/Seminar is published in the form of Proceedings, the points would accrue for the publication (III (A)) and not under presentation (III(E)(ii)).

Annexure:

Detailed explanation of indicators / activities for CAS for Teacher in **Physical education of Colleges**

CATEGORY I:

TEACHING COACHING & INFLUENCING SOCIAL COGNITIVE LEARNING RELATED ACTIVITIES

Brief explanation: based on the teachers self assesment api score proposed for (a) teaching, coaching related activities, (b) contribution to the health & social wellbeing of the stakeholders,(c) domain knowledge, (d) contribution to innovative teaching, new courses (e) participation in examination & evaluation etc. The minimum api score required by teachers from this category is 75. The self assessment score should be based on objectively verifiable criteria wherever possible and will be finalised by the screening / selection committee.

The main parameters of evaluation in category i is shown in table below:

SL ,NO	NATURE OF ACTIVITY	MAXIMUM SCORE
1.	Teaching, coaching, training and coordinating the health & recreation related activities for the students	50
2.	Extending service to institution, organisations & community in excess to norms	15
3.	Organizing & conduct of sports event	30
4.	Use of participatory & innovative teaching, coaching & training methodologies & facilities.	20
5.	Examination duties as per allotment	10
	Total score	125
Minimum API score required - 75		

Detailed explanation of indicators / activities of category I:

CATEGORY I: TEACHING, COACHING & INFLUENCING SOCIAL COGNITIVE LEARNING RELATED ACTIVITIES																																															
1. Teaching, coaching, training & coordinating health & recreation related activities for the students																																															
Sl.no	Nature of activity	Assigned score	Maximum score																																												
1.1	Class room teaching as per allocation per academic year. <u>Total hours taken x 15</u> Total hours allocated	15	50																																												
1.2	Coaching & training																																														
1.2.1	Conduct of coaching camp at college for various disciplines with not less than 15 days duration. 10 marks per discipline	15																																													
1.2.2	Team securing position at various levels of competition	10					<table border="1"> <thead> <tr> <th rowspan="2">COMPETITION</th> <th colspan="5">TEAM POSITION</th> </tr> <tr> <th>I</th> <th>II</th> <th>III</th> <th>IV</th> <th></th> </tr> </thead> <tbody> <tr> <td>Inter collegiate</td> <td>3</td> <td>2</td> <td>1</td> <td></td> <td></td> </tr> <tr> <td>District championship</td> <td>3</td> <td>2</td> <td>1</td> <td></td> <td></td> </tr> <tr> <td>State championship</td> <td>5</td> <td>3</td> <td>1</td> <td></td> <td></td> </tr> <tr> <td>Inter university</td> <td>7</td> <td>5</td> <td>3</td> <td>1</td> <td></td> </tr> </tbody> </table>				COMPETITION	TEAM POSITION					I	II	III	IV		Inter collegiate	3	2	1			District championship	3	2	1			State championship	5	3	1			Inter university	7	5	3	1			
COMPETITION	TEAM POSITION																																														
	I						II	III	IV																																						
Inter collegiate	3		2	1																																											
District championship	3		2	1																																											
State championship	5	3	1																																												
Inter university	7	5	3	1																																											
1.2.3	Individuals securing position at various levels of competitions	10	<table border="1"> <thead> <tr> <th rowspan="2">Competition</th> <th colspan="5">POSITION</th> </tr> <tr> <th>I</th> <th>II</th> <th>III</th> <th>IV</th> <th>Participation</th> </tr> </thead> <tbody> <tr> <td>Inter collegiate</td> <td>3</td> <td>2</td> <td>1</td> <td></td> <td></td> </tr> <tr> <td>District championship</td> <td>3</td> <td>2</td> <td>1</td> <td></td> <td></td> </tr> <tr> <td>State championship</td> <td>5</td> <td>3</td> <td>1</td> <td></td> <td></td> </tr> <tr> <td>Inter university/ National</td> <td>7</td> <td>5</td> <td>3</td> <td>2</td> <td>1</td> </tr> <tr> <td>International</td> <td>10</td> <td>7</td> <td>5</td> <td>3</td> <td>2</td> </tr> </tbody> </table>				Competition	POSITION					I	II	III	IV	Participation	Inter collegiate	3	2	1			District championship	3	2	1			State championship	5	3	1			Inter university/ National	7	5	3	2	1	International	10	7	5	3	2
Competition	POSITION																																														
	I		II	III	IV	Participation																																									
Inter collegiate	3		2	1																																											
District championship	3		2	1																																											
State championship	5		3	1																																											
Inter university/ National	7	5	3	2	1																																										
International	10	7	5	3	2																																										
1.3	Managing other health & recreation related activities																																														

1.3.1	Conduct of fitness awareness & assessment programme for college students	10																										
1.3.2	Conduct of intramural programmes. 5 points per event	10																										
1.3.3	Conduct of annual athletic meet	10																										
1.3.4	Fielding college teams in inter collegiate competitions. 3 points per team	10																										
2. Extending service to institution, organisation & community in excess to norms																												
2.1	Assignments of university/state/national/international events	10	15																									
	<table border="1"> <thead> <tr> <th>PARTICULARS</th> <th>UTY</th> <th>STATE</th> <th>NATIONAL</th> <th>INTERNATIONAL</th> </tr> </thead> <tbody> <tr> <td>Acted as team selector</td> <td>3</td> <td>3</td> <td>5</td> <td>10</td> </tr> <tr> <td>Acted as team coach/manager</td> <td>5</td> <td>3</td> <td>5</td> <td>10</td> </tr> <tr> <td>Officiating</td> <td>2</td> <td>3</td> <td>5</td> <td>10</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			PARTICULARS	UTY	STATE	NATIONAL	INTERNATIONAL	Acted as team selector	3	3	5	10	Acted as team coach/manager	5	3	5	10	Officiating	2	3	5	10					
PARTICULARS	UTY			STATE	NATIONAL	INTERNATIONAL																						
Acted as team selector	3			3	5	10																						
Acted as team coach/manager	5			3	5	10																						
Officiating	2	3	5	10																								
2.2	Community, institutional service																											
2.2.1	Coaching camp for school children during weekends, vacation of not less than 15 days duration	5																										
2.2.2	Extending service & facility for conduct of school, community sport	5																										
2.2.3	Conduct of health & fitness assessment, awareness & training for community/school	5																										
2.2.4	First aid awareness class	5																										
3. Conduct of sports event at college																												
3.1	International competitions	30	30																									
3.2	Inter university competitions	30																										
3.3	National level competitions	30																										
3.4	State level competitions	15																										
3.5	Intercollegiate competitions per event	15																										
3.6	District competitions	15																										
3.7	Host for state/university coaching camps	5																										
4. Use of participatory & innovative teaching/ coaching methodologies & facilities																												

4.1	Use of ICT for teaching, coaching	10	20
4.2	Updating of course, design of curriculum	10	
4.3	Preparation of resource materials, fresh reading materials, training manuals	5	
4.4	Maintenance of playfield	5	
4.5	Developing/ assigning/imparting remedial/ correctional/bridge/counseling sessions	5	
4.6	Developing, imparting, and organizing soft skills, psychological skills & personality development programmes for sportsperson	5	
4.7	Talent identification programme development & conduct	5	
5. Examination related works			
5.1	College/ university end semester examination- on work as per duties allotted: Invigilation -5 Evaluation of answer script - 5 Question paper setting - 5	10	10
5.2	College examination/ evaluation, responsibilities for internal, continuous assessment work as allotted (100% compliance -10pts)	10	
5.3	Exam works such as coordinator/ flying squad/external examiner (100% compliance – 10 pts)	10	



COURSE PLAN (2018-2019) ODD SEMESTER

Name of the Teacher: Dr. Aloysius Sabu N

Class: 3P

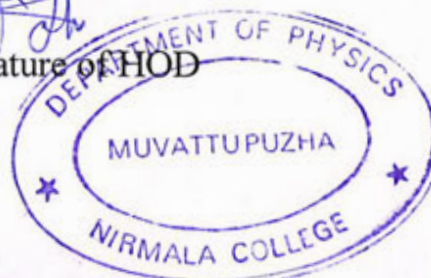
Programme	Course	No. of Modules Assigned	Total hours as per syllabus	No. of hours assigned per week	Percentage of course Completed		
					As on	No. of hours taken	Percentage of hours completed
BSc. Physics Model 1	Classical and Quantum Mechanics PH5CRT06	2	36/54	2	30.06.2018	6	10
					31.07.2018	8	30
					31.08.2018	8	60
					30.09.2018	8	80
					31.10.2018	6	100%

Class: 3PV

Programme	Course	No. of Modules Assigned	Total hours as per syllabus	No. of hours assigned per week	Percentage of course Completed		
					As on	No. of hours taken	Percentage of hours completed
BSc. Physics Model 2	Classical and Quantum Mechanics PH5CRT06	2	36/54	2	30.06.2018	6	10
					31.07.2018	8	30
					31.08.2018	8	60
					30.09.2018	8	80
					31.10.2018	6	100%

Dr. Aloysius Sabu N
Signature of the Teacher

[Signature]
Signature of HOD



Signature of Principal

COURSE PLAN (2019-2020) EVEN SEMESTER


Name of the Teacher: Dr. Aloysius Sabu N


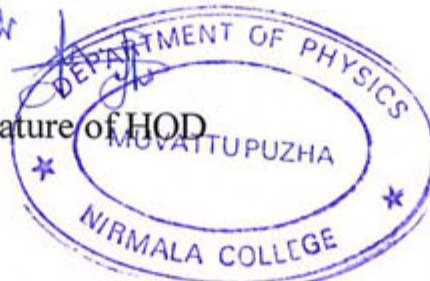
Class: 3P

Programme	Course	No. of Modules Assigned	Total hours as per syllabus	No. of hours assigned per week	Percentage of course Completed		
					As on	No. of hours taken	Percentage of hours completed
BSc. Physics Model 1	PH6CRT12: SOLID STATE PHYSICS	2	36/72	2	30.11.2019	6	10%
					31.12.2019	8	
					31.01.2020	8	
					29.02.2020	8	
					31.03.2020	6	

Class: 3PV

Programme	Course	No. of Modules Assigned	Total hours as per syllabus	No. of hours assigned per week	Percentage of course Completed		
					As on	No. of hours taken	Percentage of hours completed
BSc. Physics Model 2	PH6CRT12: SOLID STATE PHYSICS	2	36/72	2	30.11.2019	6	10%
					31.12.2019	8	
					31.01.2020	8	
					29.02.2020	8	
					31.03.2020	6	


Dr. Aloysius Sabu N
Signature of the Teacher


Signature of HOD


Signature of Principal

COURSE PLAN (2019-2020) ODD SEMESTER

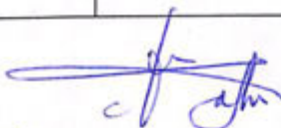
Name of the Teacher: Dr. Aloysius Sabu N

Class: 3P


Programme	Course	No. of Modules Assigned	Total hours as per syllabus	No. of hours assigned per week	Percentage of course Completed		
					As on	No. of hours taken	Percentage of hours completed
BSc. Physics Model 1	Classical and Quantum Mechanics PH5CRT06	2	36/54	2	30.06.2019	6	10
					31.07.2019	8	20
					31.08.2019	8	60
					30.09.2019	6	80
					31.10.2019	8	100

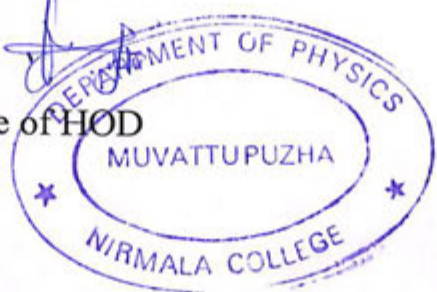
Class: 3PV

Programme	Course	No. of Modules Assigned	Total hours as per syllabus	No. of hours assigned per week	Percentage of course Completed		
					As on	No. of hours taken	Percentage of hours completed
BSc. Physics Model 2	Classical and Quantum Mechanics PH5CRT06	2	36/54	2	30.06.2019	6	10
					31.07.2019	8	20
					31.08.2019	8	60
					30.09.2019	6	80
					31.10.2019	8	100


Dr. Aloysius Sabu N

Signature of the Teacher


Signature of HOD



DEPARTMENT OF PHYSICS
MUVATTUPUZHA
NIRMALA COLLEGE

Signature of Principal

TEACHING PLAN (ODD SEMESTER) 2018-2019

Name of the Teacher:

Course: PH5CRT06 – Classical and Quantum Mechanics

Total Hours As per Syllabus: 54

Commencement of the semester: 04.06.2018

Programme: BSc. Physics Model 1

Number of Modules Assigned: 2

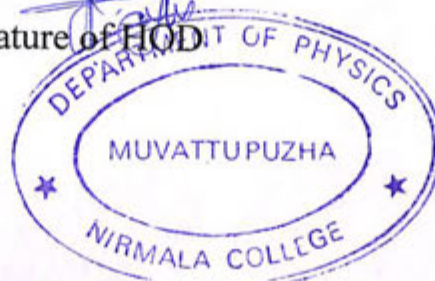
Number of Hours assigned/week: 2

Class: 3P

As On	Details of the topics to be covered	Percentage of Topics covered	Have you fully covered the topics(Yes/No)	No of Hrs Engaged	Remarks of the HOD
30.06.2018	Historical development and origin of quantum theory	10%	Yes	6	completed
31.07.2018	Historical development and origin of quantum theory...	20%	Yes	8	completed
31.08.2018	General Formalism of Quantum Mechanics	60%	Yes	8	completed
30.09.2018	Schrödinger equation and its applications	80%	Yes	6	completed
31.10.2018	Schrödinger equation and its applications... Revision and question paper discussions	100%	Yes	8	completed

Dr. Alayami Sabu N
Signature of the Teacher

[Signature]
Signature of HOD




Signature of Principal


TEACHING PLAN (EVEN SEMESTER) 2018-2019

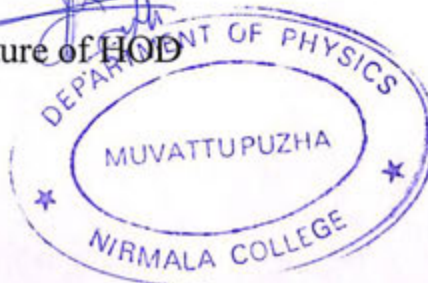
Name of the Teacher: Dr. Aloysius Sabu N
 Course: PH6CRT12- Condensed Matter Physics
 Total Hours As per Syllabus: 3
 Commencement of the semester:

Programme: BSc. Physics Model 1
 Number of Modules Assigned: 2
 Number of Hours assigned/week: 2
 Class: 3P

As On	Details of the topics to be covered	Percentage of Topics covered	Have you fully covered the topics(Yes/No)	No of Hrs Engaged	Remarks of the HOD
30.11.2018	Crystal structure Terms, simple crystal structures-sc, bcc, fcc	10%	Yes	6	completed
31.12.2018	Crystal structure.... hcp structure. X-ray Difrraction...	20%	Yes	8	completed
31.01.2019	Bonding in solids Free electron theory and elementary band theory	60%	Yes	8	completed
30.02.2019	Band theory- classification of solids based on electrical conductivity..	80%	Yes	6	completed
31.03.2019	Rivision and Question paper discussions	100%	Yes	8	completed


 Dr. Aloysius Sabu N
 Signature of the Teacher


 Signature of HOD



Signature of Principal

COURSE PLAN (2018-2019) EVEN SEMESTER

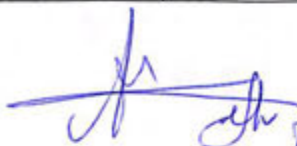
Name of the Teacher: Dr. Aloysius Sabu N

Class: 3P

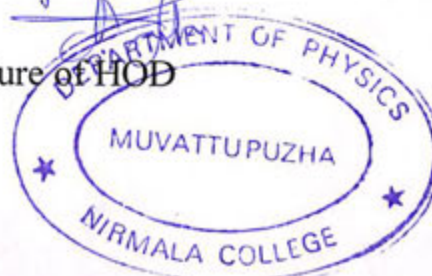
Programme	Course	No. of Modules Assigned	Total hours as per syllabus	No. of hours assigned per week	Percentage of course Completed		
					As on	No. of hours taken	Percentage of hours completed
BSc. Physics Model 1	Condensed Matter Physics	2	36/54	2	30.11.2018	6	10
					31.12.2018	8	30
					31.01.2019	8	60
					28.02.2019	8	80
					31.03.2019	6	100%

Class: 3PV

Programme	Course	No. of Modules Assigned	Total hours as per syllabus	No. of hours assigned per week	Percentage of course Completed		
					As on	No. of hours taken	Percentage of hours completed
BSc. Physics Model 2	Condensed Matter Physics	2	36/54	2	30.11.2018	6	10
					31.12.2018	8	30
					31.01.2019	8	60
					28.02.2019	8	80
					31.03.2019	6	100%


Signature of the Teacher


Signature of HOD



Signature of Principal

TEACHING PLAN (EVEN SEMESTER) 2019-2020

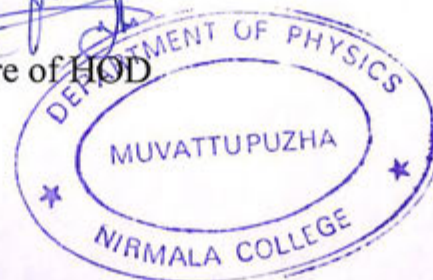
Name of the Teacher: Dr. Aloysius Sabu N
 Course: PH6CRT12- Solid State Physics
 Total Hours As per Syllabus: 72
 Commencement of the semester:

Programme: BSc. Physics Model 1
 Number of Modules Assigned: 2
 Number of Hours assigned/week: 2
 Class: 3P

As On	Details of the topics to be covered	Percentage of Topics covered	Have you fully covered the topics(Yes/No)	No of Hrs Engaged	Remarks of the HOD
30.11.2019	Crystal structure Terms, simple crystal structures-sc, bcc, fcc	10%	yes	6	completed
31.12.2019	Crystal structure . . .				
31.01.2020	Bonding in solids Free electron theory and elementary band theory				
30.02.2020	Free electron theory and elementary band theory				
31.03.2020	Rivision and Question paper discussions				

Dr. Aloysius Sabu N
 Teacher

Signature of HOD



Signature of Principal

TEACHING PLAN (ODD SEMESTER) 2019-2020

Name of the Teacher:

Course: PH5CRT06 – Classical and Quantum Mechanics

Total Hours As per Syllabus: 54

Commencement of the semester: 04.06.2019

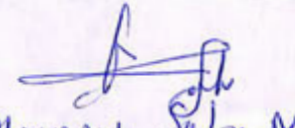
Programme: BSc. Physics Model 1


Number of Modules Assigned: 2

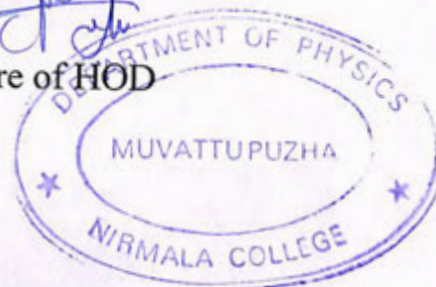
Number of Hours assigned/week: 2

Class: 3P

As On	Details of the topics to be covered	Percentage of Topics covered	Have you fully covered the topics(Yes/No)	No of Hrs Engaged	Remarks of the HOD
30.06.2019	Historical development and origin of quantum theory	10%	Yes	6	completed
31.07.2019	Historical development and origin of quantum theory...	20%	Yes	8	completed
31.08.2019	General Formalism of Quantum Mechanics	60%	Yes	8	completed
30.09.2019	Schrödinger equation and its applications	80%	Yes	6	completed
31.10.2019	Schrödinger equation and its applications... Revision and question paper discussions	100%	Yes	8	completed


Dr. Aloynus Sabu N
Signature of the Teacher


Signature of HOD



Signature of Principal





**INTERNAL QUALITY ASSURANCE CELL
NIRMALA COLLEGE, MUVATTUPUZHA**

REMEDIAL POLICY

REMEDIAL POLICY

The IQAC meeting held on 31.12.2015 resolved to formulate policy guidelines for bridge courses, remedial classes and the methodology to identify the beneficiaries. It was also resolved to frame special strategies for advanced learners. Accordingly, the proposed guidelines were submitted to the staff council for perusal and ratification. The guidelines after final approval are:

- 1) All departments are advised to conduct either post admission test or class test based on the basic concepts of each discipline.
- 2) Delineate the students as advanced, average and slow learners according to the scores of test.
Criteria (based on percentage scores) in the test:
0-49 – Slow learners
50-69 – Average
70-89 – Above average (Very good)
90 and Above – Excellent
Advanced- Top 5% among the excellent
- 3) Provide remedial classes compulsorily to all students below 50% scores and to those students with genuine interest. Firstly, familiarise the basics of each discipline according to the syllabus for bridge courses and remedial courses. Secondly, give clarifications and remedial coaching for the topics in each semester to the beneficiaries.
- 4) Those aspirants who join for disciplines other than the topics taught at the entry level (+2), are to be bridged to the mainstream by familiarising the basic concepts and theories in the discipline.
- 5) Faculty prepare and distribute self-learning materials that suit the requirements of slow learners.
- 6) Slow learners are motivated to engage in various clubs to increase their involvement in the academic activities of the department.
- 7) Group assignments and projects are given to slow learners.
- 8) The classes are ought to be arranged with a prescribed syllabus of 15 hours duration for bridge courses.
- 9) All departments are advised to keep registers separately for bridge courses, remedial courses and peer teaching.
- 10) The register shall contain:
 - The syllabus
 - List of teachers assigned
 - Students attendance with date, time and signature
 - No. of class hours engaged
 - Signature of the teacher co-ordinator
 - Counter signature of the HOD

- 11) Utilise the skills and knowledge of the advanced learners to improve the mastery and subject knowledge of the slow learners and those with genuine interest.
- 12) Assign special or extra assignments on contemporary issues to advanced learners. They should be encouraged to participate and present papers in seminars and workshops along with publishing their papers.
- 13) Besides, they are to be motivated to prepare for competitive exams like NET/JRF/JAM etc. and undertake online courses in MOOC, NPTEL and Edx platforms.
- 14) Advanced learners are to be encouraged to participate in data analysis workshops using SPSS.
- 15) They are allowed to assist the faculty members in research projects.
- 16) They are to be given cash awards, medals, merit certificates and other recognitions.
- 17) Advanced learners should be provided the opportunity to represent the college in National and State Level intercollegiate competitions
- 18) Interested aspirants are to be motivated to undergo special coaching in Nirmala Civil Service Academy, Satellite Centre of Institute of Cost Accountants of India (ICAI) and Nirmala Institute of Competitive Studies (NICS).

01.01.2016

Tongapl

Principal





**INTERNAL QUALITY ASSURANCE CELL
NIRMALA COLLEGE, MUVATTUPUZHA**

MENTORING POLICY

IQAC has established a well structured 'Three Tier Mentoring System'. At the bottom level, one faculty is allotted as mentor to a group of 30 students. In our system, mentors perform the following functions.

- i. Mentors organise class-wise meeting of mentees at the beginning of the semester.
- ii. Individual mentoring sessions are conducted twice in a semester.
- iii. Mentors monitor the academic progress of the mentees and give them counselling on personal matters.
- iv. They promote the use of e-resources in the library.
- v. They motivate the students to enrol in certificate courses and online courses offered by NPTEL and MOOC.
- vi. They also motivate them to participate in co-curricular and extracurricular activities.
- vii. They maintain a brief record of mentor-mentee discussions.
- viii. They advise the mentees to take suitable topics for their year-end projects based on SWOC analysis of mentees.
- ix. If any administrative or higher level action is required, intimate the HoD.

The role of heads of the departments is very vital in the mentoring system.

- i. HoDs meet all the mentors in the beginning of the semester and give them necessary instructions in the first department meeting itself.
- ii. Review the activities of mentors and advice them whenever the situation demands it.
- iii. Inform the parents, on issues like continuous absenteeism or behavioural changes,
- iv. Seek the intervention of respective committees, if required.
- v. Keep the IQAC Mentoring Committee informed and updated.
- vi. Identify the mentees who require financial assistance with the help of mentors.
- vii. Making available text books and other study materials free of cost to the needy mentees.

IQAC has a three member Mentoring Committee that evaluates the mentoring activity in each department. It acts as a tool to streamline and monitor the mentoring activity in various departments. On the basis of feedback from mentors and heads of departments, IQAC organises various seminars and workshops. IQAC also insists the departments to include the themes suggested by the mentors while organising the programmes. For example, a first aid room and the service of a nurse is made available to the students. Apart from this, numerous self defence training sessions have been organised with Kerala Police for female students.

Tongal

Principal



CORPORATE EDUCATIONAL AGENCY

Diocese of Kothamangalam

PERFORMANCE EVALUATION FOR THE ACADEMIC YEAR 2015- 2016
(Based on UGC regulation published in the Gazette of India, September 18, 2010)

Name of the Institution: Nirmala College Muvattupuzha
Academic Performance Indicators (API) and API Score

PERFORMANCE EVALUATION FOR THE ACADEMIC YEAR 2015 -2016

Name : ANU JOSSY JOY
 Designation : Assistant Professor (on FIP w.e.f. 02/07/2015 to 01/07/2017)
 Department : Commerce
 Date of joining : 27/09/2010
 Experience as on date : 5.9 Years
 Assessment Year : 2015 -2016
 Mobile Phone : 9495216382
 Email : annajossyjoy@gmail.com

Academic Qualifications:				Name of the Institution
Sl. No	Qualification	Month and Year	% of Marks	
			A Grade(80-85%)	SMBS, M.G. University
1.	M.Phil	March 2007	90.7(1 st Rank)	Nirmala College, Muvattupuzha
2.	M.Com.	March 2005	88.8(2 nd Rank)	"
3.	B.Com	March 2003	84.5(3 rd Rank)	"
4.	Pre Degree	March 2000	84.5	Board of Public Exams, Kerala
5.	SSLC	March 1998		UGC
6.	NET	JUNE 2006		
7.	Certified Course in Computer applications and Tally			

Research Degree:		Guide	Topic
Duration	Place of Research		
2006-2007 (M Phil) -One Year	School of Management and Business Studies, M.G.University, Kottayam	Dr. K. Sreeranganathan (Director, SMBS, M.G.University, Kottayam)	Housing finance Sector in Kerala: A comparative study of Public and Private sector banks.
Doing Ph.D from December 2013 onwards	P.G. and Research Dept. of Commerce, Nirmala College, Muvattupuzha	Dr. Gireesh Kumar G.S.(Director of Continuing Education & Associate Professor, Nirmala College, Muvattupuzha)	Job Stress and Employee Performance : A study of IT Industry in Kerala

For Office Use only						ML	Loss of Pay	Total
Calendar Year	CL	Duty Leave	On Duty	Com/Half Pay Leave				
2015								

Category I
Teaching-Learning and Evaluation

1. Semester wise percentage of classes taken (Max. Score 50)

1	2	3	4	5	6	7
Course /Paper	Branch and Semester	Mode of teaching	Hours per week allotted	No. of working days in each Semester as per academic Calendar/ semester Plan	Percentage of classes taken as per documented record	API Score Claimed
Classes taken only for one month, i.e., June 2015						
Special accounting	B. Com Regular 5 th Sem.	Lecture and Seminar	6	All working days on June		50

2. Lectures or teaching duties in excess of UGC norms (Max score 10)

Course/sem/paper:	Mode of Teaching	Days worked Semester wise	API score	API awarded
Nil				

3. Reading and Instructional material and Syllabus Enrichment by providing additional resources (Max. Score 20)

Course/sem/paper	Syllabus enrichment programmes	Readings & texts prescribed	Additional instructional material provided	API score	API awarded
III B.Com, 5 th Sem. Special accounting	Discussion of audited accounts of banks	Accounting: 1.Jain & Narang 2.S.N. Mahesari 3.K.G.C.Nair 4. S.K.R. Paul 5. Gupta & Radhaswamy	Printed notes	20	

4. Participatory and Innovative Teaching- Learning Methodologies, Updating of subject content, course improvement etc. (Maximum Score 20)

1	2	3
Parameters	Subject and Details in each Semester No. of Hours	API Claimed
Participatory and innovative teaching learning process with materials for problem based learning, case studies, group discussions, developing E-Library skills, web based assignments etc. ICT enabled teaching like power point, multimedia. simulation, software etc (Each activity 5 points.)	One case study 1 hour	5
	Presentation 1 hour	5
Total		10

5. Examination Duties Assigned and Performed (Maximum Score 25)

1	2	3	4
Type of examination duties	Duties assigned	Extent to which carried out	API Claimed
Valuation of I.P.G. and I B. Com University answer sheets (home valuation- no appointment order- only phone call)		Performed	5
	External Examiner, B. Com Viva Voce Exam May 2016	Performed	5
Total			10

Category II.
Co-Curricular, Extension and Professional Development Activities

(Maximum score: 20)		Average Hrs./ week	API Score
S. No.	Type of Activity (i) Extension, co-curricular & field based activities		
			Nil
Total Score (max score: 20)		Yearly /Semester wise responsibilities	API Score
	(ii) Contribution to corporate life & Management of the institution		5
1.	Auditor, NARP		5
Total Score (max score: 15)			

<i>(iii) Professional Development Activities</i>			
1.	NARP Member		5
2.	Nirmala Alumni Association member		5
3.	Participated in National workshop on Research Methodology & Statistical Analysis (3 days)		5
Total Score (max score: 15)			15
Total Score (i+ii+iii)(max : 20)			20

**Category III.
Research, Publication and Academic Contributions**

A. Published Papers in Journals

Sl. No.	Title with page No.	Name of the Journal	ISSN/ISB N No	Main author	peer reviewed, Impact Factor, if any	No. of Co-authors	API Score claimed
1.	Anu Jossy Joy, <i>Weather Derivatives: An emerging Trend in the Global Market</i> , PI:SQUISA, Vol. 1, Issue 1, Nov. 2015, pp 87-93.	PESQUISA Research Journal	ISSN-2455-0736	Self	Peer Reviewed Indexed Annual Journal	Nil	15

(E)(i) Training Courses, Teaching-Learning-Evaluation Technology Programs, Faculty Development Programs (not less than one week Duration)

Sl. No	Programme	Duration	Organized by	API Score
1.	National Level Knowledge Training Workshop for Researchers	One Week	Christ University Nodal Office, Thiruvananthapuram	10

(E)(ii) Papers presented in Conferences, Seminar, Workshops, Symposia

Sl. No.	Title of the paper presented	Title of conference/ Seminar	Organized by	International/ National/ State/ Regional/ College or University Level	API Score
1.	Impact of Job stress on Employee Performance in IT Sector: Formulation of Research Model	Innovative Trends in the Changing Indian Corporate Scenario	Dept. of Commerce, Nirmala College, Muvattupuzha	National level	7.5
2.	Job stress and employee Performance	Presentation for research Scholars in commerce	Dept. of Commerce, Nirmala College, Muvattupuzha	College Level	3

Future Plan for the next academic year

Curricular
Co-curricular
Research & Publications

1. To Complete of Ph. D as early as possible.
 2. To publish articles based on Review of literature on Job stress and Employee performance in IT sector in Kerala in referred journals.
 3. To conduct paper presentations on the topic
 4. To attend Research methodology workshops on Data analysis through SPSS.


LIST OF ENCLOSURES: (Please attach, copies of certificates, sanction orders, papers etc. wherever necessary)

1. FIP Order.
2. Appoint order B.Com Viva.
3. Certificate of UGC Sponsored 3 day National Workshop on Research methodology and statistical analysis conducted by RCSS.
4. Paper publication certificate.
5. Participation Certificate in One week National Level Knowledge workshop for researchers conducted by Christ University Nodal Office, Thiruvananthapuram.
6. Paper presentation certificate in the UGC sponsored 2 day National Seminar organised by Dept. of Commerce, Nirmala College, Muvattupuzha.

I certify that the information provided is correct as per records available with the university and/ or documents enclosed along with the duly filled PBAS proforma.


Signature of the applicant

Place : Muvattupuzha
Date : 08/07/2016


Countersigned by the HOD
HEAD OF THE DEPARTMENT
Research Dept. of Commerce
Nirmala College, Muvattupuzha

Remarks of the Screening/Selection Committee:-

Attached along with the Appraisal Summary
Summary sheet.

Signature of the Screening/Selection Committee Members:-

1. Rev. Dr. George Olajuram, Manager G. C.
2. Rev. Dr. George Dhanathagarambil, Secretary
3. Rev. Fr. Paul Nedumpurath, Member, Managing Board.

6



विश्वविद्यालय अनुदान आयोग
नैऋत्य प्रादेशिक कार्यालय
UNIVERSITY GRANTS COMMISSION
SOUTH WESTERN REGIONAL OFFICE
P.K. Block, Palace Road, Gandhinagar
Bangalore-560 009.
TF CODE: (Phone : (080) 2228 0380 Fax : (080) 2228 0381

FIP/12th Plan/KLMG020 TF 65

Principal
MALA COLLEGE
MUVATTUPUZHA
ERNAKULAM DISTRICT - 686 661

IS TF CODE SHOULD BE QUOTED IN ALL CORRESPONDENCE WITHOUT FAIL"

Sub:- Award of Teacher Fellowship under Faculty Development Programme during XII th Plan period.

Based on the recommendations of the Selection committee/ University, the Commission conveys approval for the award of Teacher Fellowship to MRS ANU JOSSY JOY Dept of COMMERCE, MALA COLLEGE, MUVATTUPUZHA, ERNAKULAM DISTRICT under the XIIth plan period as the details given below.

Name of the Teacher Fellow	Programme	Subject	Duration
MRS ANU JOSSY JOY	GENERAL	COMMERCE	Two year

1. The Research Center of the Teacher Fellow will be NIRMALA COLLEGE, MUVATTUPUZHA. joining in the Research Center the Teacher Fellow should submit the joining report to this office as per prescribed format (Annexure IV - FIP XI guidelines).
2. A teacher fellow will be eligible for reimbursement of actual contingency expenditure subject to a maximum of Rs.15000/- per year. The contingency grant shall be released only on receipt of the Contingency Certificate in the prescribed proforma (Annexure V, FIP XI Plan guideline) may be submitted to the SWRO, UGC.
3. The supervisor/guide of the Teacher Fellow must give a progress report in the mid of the period in which the fellowship is awarded. In case of negative report given by the Supervisor/ Guide, the awarded fellowship to the Teacher Fellow may be withdrawn by the UGC.

Contd..2.

[Signature]
PRINCIPAL
NIRMALA COLLEGE
MUVATTUPUZHA



CRITERION 6

GOVERNANCE, LEADERSHIP AND MANAGEMENT

Curriculum Feedback

1. Feedback Summary 2017

[http://nirmalcollege.ac.in/uploads/2020/01/
Feedback-Report-Summary-2017.pdf](http://nirmalcollege.ac.in/uploads/2020/01/Feedback-Report-Summary-2017.pdf)

2. Feedback 2017-18

[http://nirmalcollege.ac.in/uploads/2020/01/
Feedback-2017-2018-1.pdf](http://nirmalcollege.ac.in/uploads/2020/01/Feedback-2017-2018-1.pdf)

3. Feedback 2018-19

[http://nirmalcollege.ac.in/uploads/2020/01/
Feedback-2018-2019-1.pdf](http://nirmalcollege.ac.in/uploads/2020/01/Feedback-2018-2019-1.pdf)

FOUNDED 1953



REFORMS IN CONTINUOUS EVALUATION SYSTEM AT INSTITUTIONAL LEVEL

Sl.No	Content	Page No.
1	Appointment order of Chief Superintendent of Examination	
2	Appointment Order of Senior Assistant	
3	Photos of the examination hall and office	
4	Circular by the principal to the HoD`s to explain the importance & pattern of CIE in the classrooms by the teachers	
5	Snaps of campulse education App	
6	Details of CIE in Academic Calendar & copies of relevant pages	
7	Displaying the patterns of question papers & Answer sheets on the departmental notice boards.	
8	Discussion & Fixation of Exam dates in Council meeting - Extracts	
9	Publication of Internal exam dates in academic calendar - Extracts from academic calendar	
10	Timetable for Internal exams and duty list of teachers	
11	Timetable for Internal exams published in college Website and Educational App.	
12	Extract from TCS online about recording of attendance	
13	Verification of attendance by students from Students login portal	
14	Screenshot of TCS generated Internal Mark sheet A&B form	
15	Verification of internal marks by students from students login portal	
16	Copies of Grievances received from students on CIE and Redressal to the same	
17	Circular about conducting retest from Principal to the departments	

1. Appointment order of Chief Superintendent of Examination



MAHATMA GANDHI UNIVERSITY, KERALA

Abstract

Conduct of University Examinations of 2019 – Appointment of Chief Superintendents – Sanctioned – Orders Issued.

EA 1

No. 471/EA 1/2019/MGU

Priyadarsini Hills, Dated: 08.02.2019

Read:-

ORDER

Sanction has been accorded by the Controller of Examinations to the following Principals/ Teachers being appointed as Chief Superintendents at the Centre noted against their names for the conduct of the ensuing University Examination from 01.01.2019 to 31.12.2019.

Sl.No. Centre	Name & Designation	Centre
1.	Dr. Sr. Gigimol M.G., Principal	Alphonsa College, Arunapuram.P.O, Pala
2.	Sasidharan M.B, Associate Professor	Al-Ameen College, Edathala, Aluva
3.	Dr.Soma Sekharan B.Pilli, Principal	Al-Azhar College of Arts & Science, Thodupuzha
5.	Praseeda V., Principal	Adi Sankara Training College, Sankar Nagar, Kalady
6.	The Principal	Al-Azhar Training College, Perumpillichira.P.O, Thodupuzha
7.	Mr. James Joseph, Principal	Asian School of Architecture & Design Innovations, Vyttila, Kochi
8.	Bridgit Jeeji C.J, Principal i/c	Aquinas College, Edacochin, Cochin
9.	The Principal	Baselious College, Kottayam
10.	The Principal	Baselios Poulouse Second College, Piramadam, Ernakulam
11.	Dr.Shiny Palaty	Bharata Mata College of Commerce and Arts, Thrikkakkara, Kochi
12.	Dr.Laly Mathew, Principal	Bharata Mata College of Commerce and Arts, Choondy, Aluva
13.	Dr.Seline Abraham, Principal	Bharata Mata School of Legal Studies, Choondy, Aluva
14.	Dr.Alen Mathew, Principal	Bishop Abraham Memorial College, Thuruthicad
15.	Prof. Josephina Simon, Principal	Bishop Chulaparambil Memorial College, Kottayam
16.	Dr.Leena Mathew, Principal	Bishop Kuralacherry College for Women, Amalagiri.P.O, Kottayam
17.	Rev.Fr. Joseph N.V, Principal	Bishop Vayalil Memorial Holy Cross College, Cherpunkal, Pala
18.	Sr.Pushpalatha CMC, Principal	Carmelgiri College, Adimali, Idukki
19.	The Principal	C.E.T College of Management Science & Technology, Airapuram.P.O., Ernakulam
20.	Dr. Mathew.P.Joseph, Principal	Catholicate College, Pathanamthitta

86.	Prof. Jacob Kurian Onattu, Principal	M C Varghese College of Arts & Science, Ettumanoor, Kottayam
87.	Dr. Pushpa Marian	Mount Carmel College of Teacher Education for Women, Kottayam
88.	The Principal	Mount Zion Law College, Kadamanitta, Pathanamthitta
89.	Dr. Vilzon Koshy, Principal	Musaliar College of Arts and Science, Mylapra, Pathanamthitta
90.	Dr. C.A.Geetha, Principal	Nirmala Arts and Science College, Mulanthuruthy P.O, Ernakulam
91.	Mr.Saji Joseph, Associate Professor, Principal	Nirmala College, Muvattupuha
92.	Dr.Thomson Joseph, Assoc.Professor	Newman College, Thodupuzha
93.	The Principal	Parumala Mar Gregorios College, Valanjavattom P.O., Thiruvalla
94.	P.A Jacob, Principal	Patriarch Ignatius Zakka First Training College,Puthencruz, Ernakulam
95.	Dr. Johnson V., Principal i/c	Pavanathma College, Murickassery, Idukki
96.	Dr.K.N.Viswanathan Nair, Principal	P.R.D.S College of Arts & Science, Amara P.O., Changanacherry
97.	Mr. Feby.FAS, Principal	Presentation college of Applied Sciences, Puthenvelikkara, Ernakulam
98.	The Principal	P.G.Radhakrishnan Memmorial Sreenarayanaguru College, Asan Hills, Channanikkadu, Kottayam
99.	The Principal	Rajagiri College of Management & Applied Science, Rajagiri Vally P.O, Kakkanad, Kochi
100.	The Principal	Rajagiri College of Social Sciences, Kalamassery, Ernakulam
101.	Prof. P.K.Madanan Nair, Principal	R.Sankar Smaraka Sreenarayana College, Nedumkunnam P.O., Changanacherry
102.	The Principal	Sabari Durga College of Arts & Science, Kulathoor, Pathanathitta
103.	The Principal	Saintgits College of Applied Science, Pathamuttom.P.O., Kottayam
104.	The Principal	Sanjo College of Management and Advanced Studies, Rajakad P.O., Mullakkanam, Idukki
105.	The Principal	School of Engineering & Technology (SCMS) Paduvapuram P.O, Ernakulam
106.	Dr. G.Sashi Kumar, Principal	SCMS School of Technology &Management, Muttom, Aluva
107.	The Principal	Seth Ram Bahadur Singh Gujarati College, Mattancherry
108.	Prof. Dr. Mammen Zachariah, Principal	Shermount College of Arts & Commerce, Kanakappalam, Erumely
109.	Dr.Sr.Jeesa Grace CMC	Sneha Sadan, College of Special Education, Angamaly
110.	V.P.Gangadharan Nair, Principal	Sree Dharma Sastha College of Arts & Science, Neriamangalam, Ernakulam
111.	Dr. Padma P, Principal	Sree Sankaravidyapeedom College, Perumbavoor
112.	The Principal	S.S.M College Rajakkad, Chemmannar Road, Mukkudi P.O., Idukki

142.	The Principal	SNGIST Group of Institutions, North Paravoor
143.	The Principal	St.Paul's College, Kalamassery
144.	Dr.Shiney Baby, Principal	St.Stephens's College, Uzhavoor
145.	The Principal	S.N.D.P. Yogam Training College, Adimali
146.	The Principal	Sree Narayana Arts & Science College, Eettichuvadu, Chittar, Pathanamthitta
147.	Prof. Sanal Kumar T.Principal i/c	Sree Narayana Trusts Arts & Science College, Pambanar, Idukki
148.	The Principal	Sree Narayana College of Education, Muvattupuzha, Ernakulam
149.	The Principal	Sree Narayana Law College, Poothotta
150.	Dr. P.J.George, Principal	Sreenarayana Paramahansa College of Arts and Science, Poonjar
151.	Prof. M.S.Viswambaran	Sree Sabareesa College, Karinilam.P.O, Mundakkayam, Kottayam
152.	Fr.Johnson Mathew, Principal	St.John The Baptist's College of Special Education, Nedumkunnam, Kottayam
153.	Dr.Susamma George.P	St.John The Baptist's College of Education, Nedumkunnam
154.	The Principal	Swami Saswathikananda College, Poothotta
155.	The Principal	The Cochin College, Cochin
156.	Dr.Anita Mathai	Titus II Teachers College, SCS Campus, Thiruvalla
157.	Dr. Justin R. Nayagam,	Union Christian College, Aluva
158.	The Principal	V.N.S College of Arts & Science, Konni, Konnapapra, Pathanamthitta
159.	The Principal	Vijan Institute of Science & Technology (VISAT), Elanji, Ernakulam
160.	The Principal	Viswabrahmana College, Vechoochira, Pathanamthitta
161.	The Principal	Viswajyothi College of Engineering & Technology, Vazhakulam P.O, Muvattupuzha
162.	Prof. V.B.Jayapalan Nair, Principal	YMCA College, Aluva

JOHN A

ASSISTANT REGISTRAR XI EXAM

Copy To

- 1.Principals of all Colleges
- 2.PS to VC/PVC
- 3.PA to C.E./C.E's. Sn./CT&D Sn./EN I/II/III/V
- 4.JD,LFA
- 5.EA II/Exam. Audit I/II/III
- 6.SF/FC

Forwarded / By Order

2. Appointment Order of Senior Assistant

	NIRMALA COLLEGE MUVATTUPUZHA, ERNAKULAM (DIST) KERALA-686 661, INDIA. (Affiliated to Mahatma Gandhi University, Kottayam) Ranked on the 91 st position among the colleges in India by the NIRF Rankings 2017 and accredited by NAAC with B grade	
		30/05/2018
<h3>Appointment Order</h3>		
<p>Mr. Shaimon Joseph (Dept. of Economics) and Mr. Titu Thomas (Dept. of Physics) are appointed as the senior assistants for conducting the University examinations with effect from 01/06/2018.</p>		
		 Principal 
<hr/> <p>Ph: 0485 - 2832361 (Office) 0485 - 2836300 (Principal) 0485 - 2834689 (Bursar) Fax: 0485 - 2836300 Website: www.nirmalacollege.ac.in E-mail: nirmalacollege@gmail.com</p>		

3. Photos of Examination hall and examination office





4. Circular by the principal to the HoD`s to explain the importance & pattern of CIE in the classrooms by the teachers



NIRMALA COLLEGE

MUVATTUPUZHA, ERNAKULAM (DIST)
KERALA-686 661, INDIA.

(Affiliated to Mahatma Gandhi University, Kottayam)

Ranked on the 91st position among the colleges in India
by the NIRF Rankings 2017 and accredited by NAAC with B grade



19/07/18

To

Heads of the Departments

Sub: Regarding Continuous Internal Evaluation Procedure (CIE)

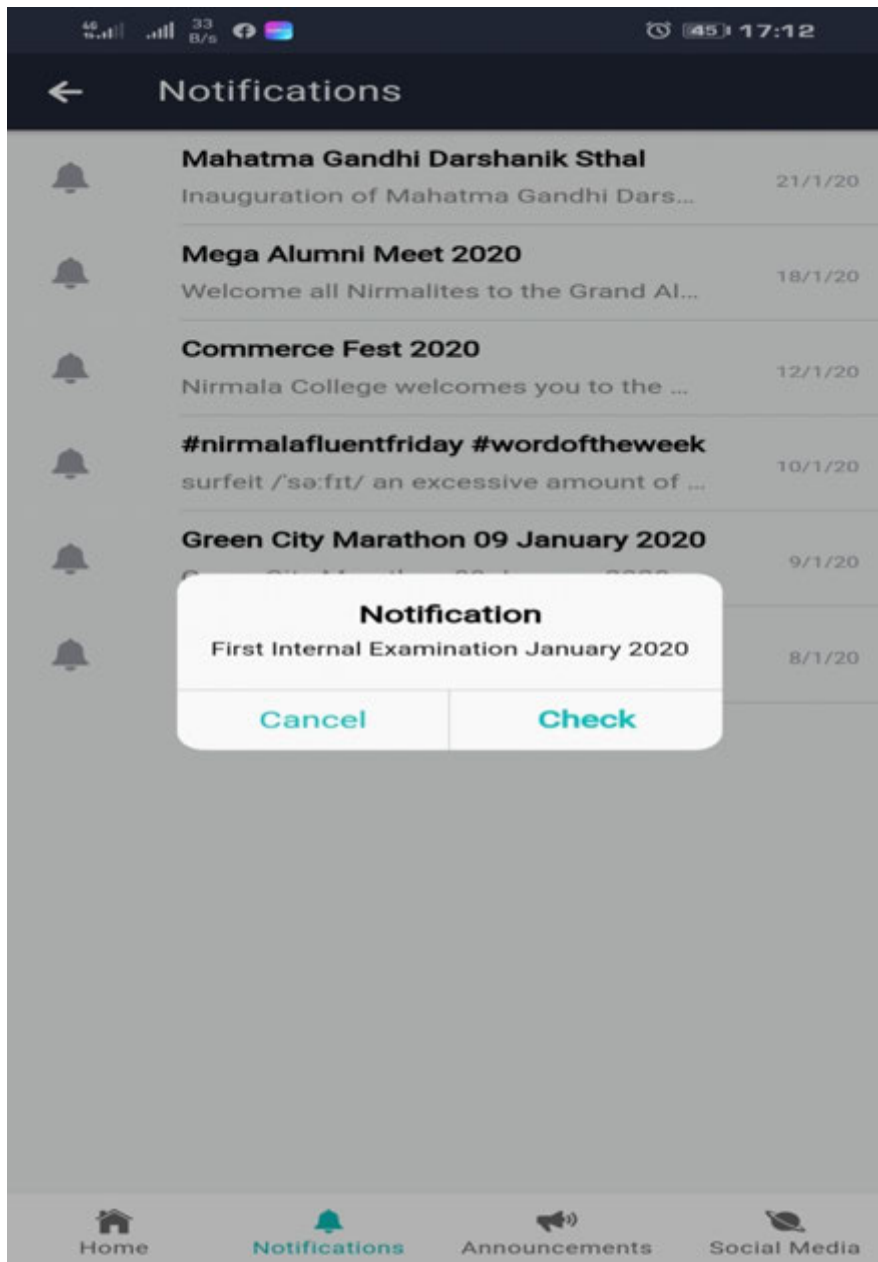
Respected Sir/Madam

As prescribed by the University, the evaluation of students is based on an examination system comprising of Continuous Internal Evaluation (CIE) and End Semester Examination (ESE). The ratio of weightage is 20% (CIE) and 80% (ESE) in the UG programmes and the same is 25% (CIE) and 75% (ESE) for P.G programmes. In the UG programme, CIE components are attendance, test papers and assignments/seminars. In the PG programme, the CIE components are attendance, test papers, assignments and seminars. There will be two internal examinations per semester. The first internal examination will be of 1 hour duration and the second one is of three hour duration conducted in the University exam pattern. The teachers should display the pattern of question papers in the department notice board at the beginning of the programme. The internal Examination is to be done in a centralized manner. After the completion of exams, the teachers should upload the marks in the TCS portal and prepare the A and B forms. Before uploading the internal marks to University portal, the B forms should be verified and signed by the students. The CIE marks of the students should be published in the respective notice board of the Department. Any Grievances regarding CIE by the students can be informed to the class tutor or HoD.

T. Jayapal
Principal



5. Snaps Campuse education App



6. Details of CIE in Academic Calendar & Copies of relevant pages

CHOICE BASED CREDIT SEMESTER SYSTEM (CBCSS) AND GRADING

The University Grants Commission (UGC) has directed all the Universities in the country to restructure undergraduate courses on 'Choice based Credit Semester and Grading pattern' in 2009-10 academic year. The M.G. University regulations are framed in accordance with UGC guidelines on restructuring undergraduate education. Accordingly, all affiliated colleges have restructured the regular non-professional undergraduate courses on the Choice Based Credit Semester System (CBCSS), a combination of internal and external evaluation with grading.

GENERAL FEATURES

1. The three year undergraduate programme will be divided into 6 semesters, each semester consisting of a minimum of 90 working days, inclusive of examinations, distributed over 18 five-day academic weeks. The duration of the odd semesters will be from June to October and even semesters from November to March.
2. The time table shall be set according to the Day order system to provide proper distribution of working days for all courses. There will be a common calendar giving schedule of admission, classes, Internal and External examinations, evaluation and publication of results.
3. The structure of the semester system will be as follows:
Common Courses: which will include compulsory courses in English and additional Languages.
Core Courses: which include methodology courses and courses on the subject of specialisation, one elective and one project which will be compulsory for all students undergoing a particular programme.

Complementary Courses: which include courses the study of which would complement the study of the subject of specialisation, which will be compulsory for all students doing a particular programme.

Open Courses: which include all courses other than courses in the area of specialisation of the student concerned, the choice which will be decided by preferences of students and availability of teachers.

4. Terminology

Credit: is a unit of academic input measured in terms of weekly contact hours assigned to a course. There could be 4 credit, 3 credit and 2 credit courses. The number of courses could vary from 30 to 38 depending on the credits assigned to different courses. At least 120 credits is needed for securing an under graduate degree in a programme.

Grace Grade: means upgraded grades awarded to courses in recognition of meritorious achievements in NCC, NSS, sports and arts.

Extra credits: are additional credits awarded to a student over and above the minimum credits required for a programme for achievements in co-curricular activities carried out outside the class hours as decided by the University.

Attendance: 75% attendance is compulsory for appearing external examinations.

Examination: There shall be both continuous Internal Evaluation and end semester External Evaluation. The ratio between Internal and External examinations is 1:3.

Evaluation: The Evaluation of both Internal and External Examinations will be carried out using direct grading system on a 5 point scale (A,B,C,D and E). Over all certification of a programme will be carried out using 7 point scale (A+, A, B+, B, C+, C and D).

5. A separate minimum of grade D for Internal and External are required for a pass for a course. For a pass in a programme, a separate minimum of grade D is required for all the courses and must score a minimum cumulated credit 120 and minimum Cumulated Grade Point Average (CGPA) of 2.00 (or an overall grade of C+) and above.
6. There will be no supplementary examinations. For reappearance/improvement, students can appear along with the next batch. Students who are not eligible for condonation of shortage of attendance should repeat the course along with the next batch.
7. A student who register his/her name for the external examination of a semester (i.e., having a minimum of grade D in the Internals for all courses and a minimum of 75% attendance.) will be eligible for promotion to the next semester.
8. The following 5 point scale is adopted for grading the answers in an examination Letter Grade Performance Grade Point Grade Range

A	Excellent	4	3.5 - 4.00
B	Very Good	3	2.5 - 3.49
C	Good	2	1.5 - 2.49
D	Average	1	0.5 - 1.49
E	Poor	0	0 - 0.49

9. The overall grade for certification will be based on CGPA with 7 point scale given below.

CGPA	3.80-4.0	3.5-3.79	3.0-3.49	2.5-2.99	2.0-2.49	1.5-1.99	1.0-1.49
Grade	A+	A	B+	B	C+	C	D

10. Grading of Attendance

<u>% of Attendance</u>	<u>Grade</u>
> 90	A
85-90	B
80-85	C
75-80	D
< 75	E

11. Publication of Internal Marks

Internal Marks will be published at the end of each semester so that students can get the anomalies rectified

12. Grievance Redress Mechanism

A three level grievance redress mechanism is envisaged to address the grievance of students.

Level 1: Department Level- Chaired by the HoD.

Level 2: College Level- Chaired by the Principal

Level 3: University Level- Chaired by the Vice Chancellor

OPEN COURSES OFFERED FOR THE V SEMESTER

<u>Department</u>	<u>Name of the Course offered</u>
English	English for Careers
Hindi	Film Studies
Malayalam	കുറിശ്ശിപ്പുഴ കഥകളി
Mathematics	Applicable Mathematics
Physics	Energy and Environmental Studies Amateur Astronomy
Chemistry	Chemistry in Everyday Life

Botany	Agribased Micro Enterprises
Zoology	Man, Nature and Sustainable Development
Economics	Foundations of Environmental Economics
Commerce	Fundamentals of Accounting
Comp. Science	Internet, Web Designing & Cyber Laws
Physical Edn.	Physical Health and Life Skills Education

RULES AND REGULATIONS

(i) GENERAL DISCIPLINE

Nirmala College is your foster mother, the campus is your home. Apart from your parents, the teachers are most concerned about you and most interested in your future. Do your best to preserve the calm academic atmosphere of the campus.

Every member of the College should carefully note the following rules and accepted traditions and try to respect them both in letter and in spirit.

1. All inmates of the College shall behave always and everywhere with respect for God and love for the country. They shall pay special attention to good manners, gentlemanly behaviour, modest dress, order and cleanliness and shall do everything to maintain the dignity of the human person and the good name of the institution. They shall respectfully follow the instructions issued by the Principal and other competent authorities, from time to time.
2. U.G Students & MCA, MHRM & MTA Students shall come to the college in Uniform on all working days except days given exemption.
3. Each class will be entrusted to a Class Teacher. Besides, students will also be divided into groups and entrusted to the care of a tutor.
4. Students shall greet teachers within the College premises, as also when they meet them in public.
5. The first bell is rung 10 minutes before the commencement of each session, the 2nd bell 5 minutes before, and the third bell at the hour for commencement. By the second bell all students will occupy their seats. At the third bell in the morning all students and members of the staff will stand up and join the College Prayer. Two bells rung at the end of morning and evening sessions. At the end of the last hour there will be National Anthem.
6. Students shall be punctual and earnest in attending classes and other academic, co-curricular and extra curricular activities.
7. Students who happen to have no classes are not to loiter about during class hours; they must be in the Library. Outside class hours and Library hours, lady students must always remain in the waiting rooms.
8. Students shall prudently avoid bad company which leads to failure in study, character and life.

7. Discussion & Fixation of Exam dates in IQAC and Council meeting -Extracts

May. Edms.

Minutes of Staff Council Meeting at 3.45 pm on 08/03/2017 in Conference Room

1. The meeting started with a silent prayer.
2. The meeting resolved to conduct the **regular classes of Second semester UG** programmes up to **22-03-2017**. Special Classes may be arranged on 09/03/2017 to 22/03/2017, from 03.30 to 04.30 pm.
3. **The second Internal Examination for the Second Semester UG Programmes may be conducted as a university Model Examination, of three hours duration on March 24, 27, 28, 29, 30 and 31. The Question Papers for the same may be submitted on or before 15/03/2017.**
4. The meeting resolved to mark the regular attendance for Second Semester UG programmes up to the last day of the second Internal Examination, ie. Up to **31/03/2017**.
5. **The second Internal Examination for the Fourth Semester PG Programmes and First Internal Examination for the second Semester PG Programmes may be conducted on March 28, 29 and 30. The Examination will be of two hours duration and conducted FN and AN on the above days. The Question Papers for the same may be submitted on or before 20/03/2017.**
6. The meeting resolved to entrust the class teachers and HOD's to forward the application of students for condonation, after proper verification to establish the genuineness of application and with necessary factual remarks.
7. **The meeting resolved to conduct the PTA meeting for the Second semester UG programmes on 16/03/2017 at 01.30 pm.**
8. The meeting resolved to seek opinion from the concerned HOD before forwarding applications of students to the University for re-admission and intercollegiate transfer.
9. Meeting also resolved to forward the application for attendance of students to the principal only in deserving cases and if informed to the department before availing leave from the class.
10. The principal entrusted the HOD's to collect and submit the PBAS to the principal for the academic year 2016 – 17, before **31/03/2017**, after documentary verification by the HOD's and counter signing the same.
11. Principal informed the council members to submit the names of at least four students from each science department, so as to select a group of fifteen students from science stream of the college, in order to represent the college in Germany, as part of cultural exchange programme.

Handwritten signature
08-03-17



Staff Council Secretary

8. Publication of Internal exam dates in academic calendar -Extracts from academic calendar

JULY 2017		
MONDAY	Tuesday	Wednesday
31 ▶ Internal Exams for III & V Sem Degree Classes		
3 ▶ St. Thomas Day Local Holiday	4	5
10 ▶ Physics Seminar on Colour & Visual Computing by Dr. Sony George, NTNU, Norway	11 ▶ Centre for Women Empowerment inauguration by Dr. J. Prameela Devi ▶ No Own Vehicle Day	12
17	18 ▶ Monthly Lecture by Dr. N.C. Induchoodan	19
24	25	26

JANUARY 2018

MONDAY	Tuesday	Wednesday
1 ▶ Opens after Christmas Holidays	2 ▶ Mannam Jayanthi	3
8 ▶ Commencement of IV & VI Sem. UG internal Exam	9 ▶ No Own Vehicle Day	10
15	16	17 ▶ Sports Fest
22	23	24
29 ▶ Commencement of II Sem. UG internal Exam	30 ▶ IV Sem. UG PTA meeting	31 ▶ VI Sem. UG PTA meeting

OCTOBER 2017

MONDAY	Tuesday	Wednesday
30	31	
2 ▶ Gandhi Jayanthi	3	4
9	10 ▶ Diamond Jubilee Memorial lecture by Dr. George Onakoor ▶ No Own Vehicle Day	11
16	17	18 ▶ Deepavali
23 ▶ Commencement of I sem, UG & III Sem P.G Model Exam.	24	25

FEBRUARY 2018

MONDAY	Tuesday	Wednesday
5	6	7
12	13 ▶ Maha Sivarathi	14
19 ▶ Commencement of IV & VI Sem.UG Model Exams	20	21 ▶ II Sem UG. PTA meeting
26	27	28 ▶ National Science Day Lecture

9. Timetable for Internal exams & Duty list of teachers

Time table

Nirmala College, Muvattupuzha

~~First~~ **Second** Internal Examination OCTOBER 26, 27, 31 & NOV 01 2016

Time Table - B. A./B. Sc./B. Com./BCA/BTTM/MSc/MTTM/MA/MHRM

26.10.2016		FN 9.45 AM to 11.45 AM		
I Sem.	B.A./B.Sc./B.Com/BCA/BTTM	Communication Skills in English	01 ✓	
III Sem M. A	English	American Literature	02 ✓	
	Hindi	Modern Poetry I: Adunik Kavitha I	03 ✓	
	Malayalam	Malayala Kavitha - Adhunikam - Randam Ghattam	04 ✓	
	Economics	International Trade : Theory and Policy	05 ✓	
M. Sc.	Mathematics	Multivariate Calculus and Integral Calculus	06 ✓	
	Statistics	Statistical Testing of Hypothesis theory	07 ✓	
	Chemistry	Structural Inorganic Chemistry	08 ✓	
	Zoology	Animal Physiology	09 ✓	
M. Com.	Finance (Reg. & SF)	Management Accounting	10 ✓	
MHRM		Global Business Environment	11 ✓	
26.10.2016		AN 1.45 PM to 3.45 PM		
I Sem.	B.A./B.Sc./C.E.	Reading Literature in English	51 ✓	
	B.Sc. Phy (Voc)	Poetry and Communicative Hindi/ ...	52 ✓	
	B.Com	Prose and applied Hindi/ ...	53 ✓	
	B.Com (Voc) <i>lcc</i>	Enterprise Resource Planning	54 ✓	
	Model III Tax <i>Kp</i>	Environmental Studies	55 ✓	
	Model III OMSP <i>lu</i>	Fundamentals of Typewriting	56 ✓	
	BCA	Mathematics	57 ✓	
	BTTM	Fundamentals of Tourism	58 ✓	
	III Sem M. A	English	Cultural Studies	59 ✓
		Hindi	Katha Sahitya I : Samakaleena Katha Sahitya Fiction II	60 ✓
	Malayalam	Malayala Bashavyakaranam	61 ✓	
	Economics	Public Economics	62 ✓	
MSc.	Mathematics	Functional Analysis	63 ✓	
	Statistics	Statistical Testing of Hypothesis	64 ✓	
	Chemistry	Organic Syntheses	65 ✓	
	Zoology <i>67 ✓ 67A ✓</i>	Cell and Molecukar Biology	66 ✓	
M. Com.	Finance (Reg. & SF)	Direct Taxes - Law and Practice <i>MA G...</i>	67 ✓	
MHRM		Manpower Sourcing	68 ✓	
MTTM		Organizational Behaviour	69 ✓	
		Business Environment	67	

Nirmala College, Muvattupuzha

First Internal Examination OCTOBER 26, 27, 31 & NOV 01 2016

Time Table - B. A./B. Sc./B. Com./BCA/BTTM/MSc/MTTM/MA/MHRM

10.2016	AN 1.45 PM to 3.45 PM		
I Sem. B.Sc.	Mathematics	Foundation of Mathematics	151 ✓
	Physics/PV	Methodology in Physics	152 ✓
	Chemistry	Methodology of Chemistry as a Discipline of Science	153 ✓
	Botany	Methodology and Perspectives of Science & An Introduction to the World of Plant Diversity	154 ✓
	Zoology	General Methodology and Perspectives in Science	155 ✓
I Sem B.A.	Economics	Methodology of Social Science with Special Reference to Economics	156 ✓
	Malayalam	മലയാളം	157 ✓
	Hindi	Development of Hindi Language	158 ✓
	Comm. English	Grammar and Conversational Skills	159 ✓
	B.Com/B.Com (Voc)	Modern Banking	160 ✓
	B.Com Voc / Model III Tax/OMSP	Modern Banking	161 ✓
	BCA	Introduction to Computers	162 ✓
	BTS	Statistics for Tourism Business	163 ✓
III Sem M. A	English	Modes of Fiction	164 ✓
	Hindi	Baratheeya Sahithya	165 ✓
	Malayalam	Drisyakalasaahithyam	166 ✓
	Economics	Economics of Environment and Social Sector	167 ✓
M. Sc.	Mathematics	No Exam	168
	Statistics	No Exam	169
	Chemistry	Spetroscopic Methods in Chemistry	170 ✓
	Zoology ✓	Immunology	171 ✓
M. Com.	Finance (Reg. & SF) 172A ✓	Corporate Governance	172 ✓
MHRM		Human Resource Development	173
MTTM		Accounting and Finance for Tourism	174 ✓

Nirmala College, Muvattupuzha
 First Internal Examination OCTOBER 26, 27, 31 & NOV 01 2016
 Time Table - B. A./B. Sc./B. Com./BCA/BTMM/MSc/MTTM/MA/MHRM

0.2016		AN 1.45 PM to 3.45 PM	
I Sem. B.Sc.	Mathematics	Basic Statistics - I	251 ✓
	Physics /PV/Chemistry	Differential Calculus and Trigonometry	252 ✓
	Botany	Animal Diversity, Non chordata	253 ✓
	Zoology	Crypto gram, Gymnosperms and Plant Pathology	254 ✓
I Sem B.A.	Malayalam	മലയാളം, നിരീക്ഷണം	255 ✓
	Hindi	Functional Hindi & Technical Terminology	256 ✓
	B.Com/B.Com (Voc)	Perspectives and Methodology of Buseiness Studies	257 ✓
	BCom Voc Model III Tax/OMSP	Perspectives and Methodology of Buseiness Studies	258 ✓
III Sem M. A	English	No Exam	
	Hindi	No Exam	
	Malayalam	No Exam	
	Economics	No Exam	
M. Sc.	Mathematics	Number Theory and Cryptograhly	259 ✓
	Statistics	No Exam	
	Chemistry	No Exam	
	Zoology	No Exam	
M. Com.	Finance (Reg. & SF)	Account Direct Tax Labour Practices No Exam	260 ✓
MHRM		Industrial Relations	261

I Sem MTTM

German

TOP SPL

262

Nirmala College, Muvattupuzha

First Internal Examination OCTOBER 26, 27, 31 & NOV 01 2016

Time Table - B. A./B. Sc./B. Com./BCA/BTTM/MSc/MTTM/MA/MHRM

0.2016	FN 9.45 AM to 11.45 AM		
I Sem. B.Sc.	Mathematics	Properties of Matter and Mechanics	201 ✓
	Physics/Botany/Zoology	Basic Theoretical and Analytical Chemistry	202 ✓
	Physics (Voc)	Electronics Application	203 ✓
	Chemistry	Properties of Matter, Mechanis and Particle Physics	204 ✓
I Sem B.A.	Economics	Social formation in Pre-modern India	205 ✓
	Malayalam	കേരള സാമൂഹിക ചരിത്രം	206 ✓
	Hindi	Journalism	207 ✓
	Comm. English	An Introduction to Sociology	208 ✓
	B.Com/B.Com (Voc)	Business Regulatory Framework	209 ✓
B.Com Voc	Model III Tax/OMSP	Business Regulatory Framework	210 ✓
	BCA	Methodology of Problem solving and programming in 'C'	211 ✓
	BTTM	Economics and Banking for Managers	212 ✓
III Sem M. A	English	Texts and Performance	213 ✓
	Hindi	Translation Studies	214 ✓
	Malayalam	Keralasamskara Padanam	215 ✓
	Economics	Monetary Theory and Policy	216 ✓
M. Sc.	Mathematics	Differential Geometry	217 ✓
	Statistics	Multivariate Analysis	218 ✓
	Chemistry	No Exam	219
	Zoology	No Exam	
M. Com.	Finance (Reg. & SF)	Business-Environment	219 ✓ Direct Tax Law approach
MHRM		Performance Management and Reward System	220

MTTM

Tourism Environment Management 221 ✓

Duty list of Teachers

Internal Exam October 27 AN 2016			
Sl. No.	Name of the Teacher	Department	Class
1	Dr. Neerada Maria Kurian	Hindi	✓ 103 ✓
2	Liji George <i>Emmanuel AS</i>	Economics <i>Commerce</i>	✓ 214 ✓
3	Mittumol Babu	Economics	✓ 215 ✓
4	Shaimon Joseph <i>Mathew S</i>	Economics <i>Chemistry</i>	✓ 217 ✓
5	Dr Annie Thomas	Malayalam	✓ 303 ✓
6	Fr Francis Michael <i>(duplication)</i>	Malayalam	305 ✓
7	Nirmala George <i>Anetamol Antony</i>	Mathematics	✓ 306 ✓
8	Liya Mary George <i>Georgy Neesal</i>	History <i>Economics</i>	✓ 308 ✓
9	Jasmine Mary P.J.	Hindi	✓ 311 ✓
10	Aby Thomas	Commerce	✓ 322 ✓
11	St. Liney Joseph <i>Saibya Cyriac</i>	Botany	✓ 323 ✓
12	Anet Thomas	Computer Science	✓ 504 ✓
13	Arun Geo Augustine	English	✓ 607 ✓
14	Seethi Vilphy <i>Poozhi Binu</i>	English <i>Computer Science</i>	✓ (704) ✓
15	Aneesh Sankar P.S. <i>Dr. Marthakutty</i>	Hindi <i>Chemistry</i>	✓ 706 ✓
16	Dr Sreeja G R	Hindi	✓ 708 ✓
17	Apsara Francis <i>Nisha Sukumaran</i>	Mathematics	✓ 902 ✓
18	Soumya T.K.	Commerce	✓ 903 ✓
19	Swathichithra K.S.	Commerce	✓ 904 ✓
20	Saritha K.S.	Commerce	✓ 905 ✓
21	Dr. Suja C	Hindi	✓ 102C ✓
22	Nisha Sukumaran <i>Poozhi S</i>	Mathematics <i>Commerce</i>	✓ LB-D ✓
23	Soni Sebastian T	Mathematics	✓ LB-E ✓
24	Jain John	Physics	✓ LB-F ✓
25	Anjaly P R.	Tourism Studies	✓ LB-G ✓
26	Diya Mathews	Tourism Studies	✓ LB-H ✓
27	Jobin Russel <i>Dr. Suleia Emmanuel</i>	Tourism Studies <i>Hindi</i>	✓ LB-I ✓
28	Dr. Sr. Tessy Joseph	Botany	R
29	Saiby Cyriac	Botany	R
30	N. Shibir Mohanan	Botany	R 323
31	Ann Maria Thomas	Chemistry	R 214
32	Dr. Marthakutty Joseph	Chemistry	R
33	Jyothish Kothanappillil	Chemistry	R 706
34	Mathews Manayani	Chemistry	R
35	Mercyamma Jacob	Chemistry	R
36	Sr. Emy Tom	Chemistry	R 103
37	Abitha M.T.	Commerce	R 902
38	Alphonsa Jose	Commerce	R 308
39	Ann Mary George	Commerce	R
40	Arunima O.G. <i>Swathi Chitra</i>	Commerce	R 903
41	Christy Mathews	Commerce	R 904
42	Dr. Johnson Varghese	Commerce	R
43	Dr. Suby Baby <i>M.G.U exam</i>	Commerce	R
44	Emmanuel A J	Commerce	R

INTERNAL EXAM- DUTY LIST-26/10/2016 FN

No	Name	Dept.	Room No.
	Philip Augustine	Chemistry	✓ 103 ✓
	Deepa Abraham	Economics	✓ 214 ✓
	Freudson P. Jose	Physics	✓ 215 ✓
	Titu Thomas	Physics	✓ 217 ✓
5	Leena Mathews	English	✓ 303 ✓
6	Dilmol Varghese	Zoology	✓ 306 ✓
7	Jisha Jacob M.A. ✓	Zoology	✓ 308 ✓
8	Dr. Johnson Varghese	Commerce	✓ 311 ✓
9	Susan Varghese	Physics	✓ 322 ✓
10	Dr. Sr. Tessa Joseph ✓	Botany	✓ 323 ✓
11	Delitia M. George	Computer Science	✓ 504 ✓
12	Dr T M Jacob	Statistics	607 ✓
13	Shini Mathew Smithy ✓	Comm - Hindi ENG.	704 ✓
14	Dr. Lissy Joseph	Malayalam	✓ 706 ✓
15	Dr. Beenamma Mathew	Malayalam	✓ 708 ✓
16	Rakhy Rajan	Commerce	✓ 902 ✓
17	Parvathy S.	Commerce	✓ 903 ✓
18	Lissy Paul	Commerce	✓ 904 ✓
19	Ann Mary George	Commerce	✓ 905 ✓
20	Mercyamma Jacob	Chemistry	✓ 102C ✓
21	Merin P. James	Physics	✓ LB-D ✓
22	Ancy John	Tourism Studies	✓ LB-E ✓
23	Anitha Issac	Tourism Studies	✓ LB-F ✓
24	Prince Samuel Joseph	English	✓ LB-G ✓
25	Anumol K. George	Mathematics	✓ LB-H ✓
26	Dr. Jerome K. Jose	English	✓ LB-I ✓
27	Jaiby Cyriac	✓ Botany	R ✓
28	N. Shibir Mohanan	✓ Botany	R ✓
29	Anns Maria Thomas	✓ Chemistry	R ✓
30	Jyothish Kothanappillil	✓ Chemistry	R ✓
31	Mathews Manayani	✓ Chemistry	R ✓
32	Aby Thomas	✓ Commerce	R ✓
33	Alphonsa Jose	✓ Commerce	R ✓
34	Arunima O.G.	Commerce	R ✓
35	Christy Mathews	Commerce	R ✓
36	Joice Jolly	Commerce	R ✓
37	Joy Mathew	Commerce	R ✓
38	Meenu Ann Joseph	Commerce	R ✓
39	Ninu Jose	Commerce	R ✓
40	Priya K. Dev	✓ Commerce	R ✓
41	Sijo Mathew	Commerce	R ✓
42	Swathichithra K.S.	✓ Commerce	R ✓
43	Anet Thomas	Computer Science	R ✓
44	Divya Rajan	Computer Science	R ✓
45	Niby Babu	Computer Science	R ✓

~~323~~ 323-322
~~302~~ 302 LB-D, E
 103-102C
~~102~~ 214-215
 LB-F, G
 308, 311
 708, 706

 902-903
~~904~~ 905
 904-905

Internal Exam October 27 AN 2016

Sl. No.	Name of the Teacher	Department	Class
1	Dr. Neerada Maria Kurian	Hindi	✓ 103 ✓
2	Liji George Emmanuel AS	Economics Commerce	✓ 214 ✓
3	Mittumol Babu	Economics	✓ 215 ✓
4	Shaimon Joseph Mathew S	Economics Chemistry	✓ 217 ✓
5	Dr Annie Thomas	Malayalam	✓ 303 ✓
6	Fr Francis Michael (duplication)	Malayalam	305 ✓
7	Nirmala George Anestamol Antony	Mathematics	✓ 306 ✓
8	Liya Mary George Georgy Nersal	History Economics	✓ 308 ✓
9	Jasmine Mary P.J.	Hindi	✓ 311 ✓
10	Aby Thomas	Commerce	✓ 322 ✓
11	St. Liney Joseph Saiby Cyriac	Botany	✓ 323 ✓
12	Anet Thomas	Computer Science	✓ 504 ✓
13	Arun Geo Augustine	English	✓ 607 ✓
14	Sruthi Vilphy Preethi Binu	English Computer Science	✓ (704) ✓
15	Ancesh Sankar P.S. Dr. Marthakutty	Hindi Chemistry	✓ 706 ✓
16	Dr Sreeja G R	Hindi	✓ 708 ✓
17	Apsara Francis Nisha Lakshmanan	Mathematics	✓ 902 ✓
18	Soumya T.K.	Commerce	✓ 903 ✓
19	Swathichithra K.S.	Commerce	✓ 904 ✓
20	Saritha K.S.	Commerce	✓ 905 ✓
21	Dr. Suja C	Hindi	✓ 102C ✓
22	Nisha Sukumaran Parvathy S.	Mathematics Commerce	✓ LB-D ✓
23	Soni Sebastian T	Mathematics	✓ LB-E ✓
24	Jain John	Physics	✓ LB-F ✓
25	Anjaly P R.	Tourism Studies	✓ LB-G ✓
26	Diya Mathews	Tourism Studies	✓ LB-H ✓
27	Jobin Russel Dr Sulic Emmanuel	Tourism Studies Hindi	✓ LB-I ✓
28	Dr. Sr. Tessa Joseph	Botany	R
29	Saiby Cyriac	Botany	R
30	N. Shibin Mohanan	Botany	R 323
31	Ann Maria Thomas	Chemistry	R 214
32	Dr. Marthakutty Joseph	Chemistry	R
33	Jyothish Kothanappillil	Chemistry	R 706
34	Mathews Manayani	Chemistry	R
35	Mercyamma Jacob	Chemistry	R
36	Sr. Emy Tom	Chemistry	R 103
37	Abitha M.T.	Commerce	R 902
38	Alphonsa Jose	Commerce	R 308
39	Ann Mary George	Commerce	R
40	Arunima O.G. Swathichithra	Commerce	R 903
41	Christy Mathews	Commerce	R 904
42	Dr. Johnson Varghese	Commerce	R
43	Dr. Suby Baby M.G.U exam.	Commerce	R
44	Emmanuel A.J	Commerce	R

11. Time table for Internal exams published in the Educational App and college Website.

4G 3G 17:38 Vol LTE1 4G+ 5%

Internal Examination
January 2020

Nirmala College, Muvattupuzha

II, IV, VI Sem Degree/ II, IV Sem PG First Internal I

Timetable – BA/BSc/BCA/BTTM/BCom/Bvoc/M A/Ph

25.01.2020

SLNo	Semester & Programme
1	II Sem BSc.Mathematics
2	II Sem BSc.Phy.
3	II Sem BSc. Phy. Voc.
4	II Sem BSc.Chemistry
5	II Sem BSc.Botany

Internal Examination January 2020



Nirmala College, Muvattupuzha

[Login](#)
[Library](#)
[360°](#)
[Media Lab](#)
[Alumni](#)

out

Academics



IQAC

SLNo	Semester & Programme	Name of the paper
1	II Sem BSc.Mathematics	Mechanics and Astrophysics
2	II Sem BSc.Phy.	Basic Organic Chemistry
3	II Sem BSc. Phy. Voc.	Power Electronics
4	II Sem BSc.Chemistry	Mechanics and Superconductivity
5	II Sem BSc.Botany	Basic Organic Chemistry
6	II Sem BSc.Zoology	Basic Organic Chemistry
7	II Sem B.A.Mahalam	...

12. Extract from TCS online recording of attendance

The screenshot shows the TCS Modules web interface. The main content area displays an 'Individual Attendance Report' for student ADWINATH RAVI, admission number E580237, roll number 3601, in the class IV Sem-BA Eco-BA Economics. The report covers the period from 01/11/2019 to 31/03/2020. The attendance is recorded as follows:

Date	1	2	3	4	5	FN	AN	Attendance	Remarks
12/11/2019	U	U	U	A	A	-	A	A	
14/11/2019	P	P	U	U	U	/	-	\	
15/11/2019	A	U	U	U	U	A	-	A	
21/11/2019	P	P	U	U	P	/	/	X	
22/11/2019	U	A	U	P	A	A	A	A	
25/11/2019	A	U	U	A	A	A	A	A	
26/11/2019	P	P	U	U	P	/	/	X	
27/11/2019	P	A	U	U	U	A	-	A	
28/11/2019	P	P	P	U	P	/	/	X	

You are signed in as YAGAL1542

Attendance Entry

url: nirmalacollege.mphlegic.com/Students/StudentsAttendanceForm.aspx

Getting Started | nirmalacollege MSU | Kullappalli - Malayala..

Nirmala College, Muvattupuzha Total Campus Solution

Module Home Student Attendance Examination Fee Performance Status Reports

Academic Management
 Programme Management
 Student Management
 Attendance
 Attendance Entry
 Student Absence Entry
 Absentee Entry
 Paperwise Entry
 Attendance Shortage Mail
 Attendance Settings
 Classwise Attendance Entry
 Student Duty Leave Entry
 Examination
 Faculty
 Examination Schedule
 Fee
 PD Accounts
 Class Room Management
 Performance Evaluation
 Security
 Time Table

Attendance Entry

Course: Com Model II Office Management & Secretarial P Semester: IV Sem-BCom Off M Date: 28/11/2019

Present Absent UnMarked Duty Leave Freeze

Adm No	Name	Roll No	M1	M2	M3	M4	M5
<input type="checkbox"/>	SK2145 ABHITHI JAYAN	4201	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	SK2087 AJITH C RAJU	4202	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	SK2158 ABARSHA MAJED	4203	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	SK2126 ADIL P JOSE	4204	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	SK2080 AG ANBEN C I	4205	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	SK2004 ALBY BENY	4206	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	SK3009 ALLEN PELOUSE	4207	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	SK2024 AMAL SAGAN	4208	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	SK2889 ANAND KRISHNAN	4209	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	SK2905 ANJ MATHEW	4211	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	SK2923 ASHRAF K S	4212	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	SK2880 BASIL MATHEW	4213	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	SK2066 BISHU S BINA	4214	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	SK2027 BISHU K BDU	4215	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	SK2922 ELDOSE MATHEW	4216	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	SK3253 GINO SOHAN	4217	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	SK3038 GOVARDHAN ANS	4218	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

You are signed in as YAGAL1542

TCS Modules

url: nirmalacollege.mphlegic.com/Reports/Currents/IndividualAttendance.aspx

Getting Started | nirmalacollege MSU | Kullappalli - Malayala..

Name: ADWINATH RAVIS From Date: 01/11/2019 To Date: 31/03/2020

Generate

Export to the selected format... Export

Nirmala College, Muvattupuzha
 INDIVIDUAL ATTENDANCE REPORT 01/11/2019 - 31/03/2020

Name: ADWINATH RAVIS
 Admission No: 868037 Roll No: 3601
 Class: IV Sem-BA Eco-BA Economics

Date	1	2	3	4	5	FN	AN	Attendance	Remarks
12/11/2019	U	U	U	A	A	-	A	A	
14/11/2019	P	P	U	U	U	/	-	1	
16/11/2019	A	U	U	U	U	A	-	A	
20/11/2019	P	P	U	U	P	/	/	X	
22/11/2019	U	A	U	P	A	A	A	A	
25/11/2019	A	U	U	A	A	A	A	A	
26/11/2019	P	P	U	U	P	/	/	X	
27/11/2019	P	A	U	U	U	A	-	A	
28/11/2019	P	P	P	U	P	/	/	Y	

Attendance Entry

Course: BSc Mathematics Semester: VI Sem-BSc Maths Date: 28/11/2019

Adm No	Name	Roll No	M1	M2	M3	M4	M5
<input type="checkbox"/>	M58512 ADARSH SASINDRAN	6001	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	M58895 AJD ANTONY	6002	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	M58502 AMAL JOSE	6003	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	M58758 ANVAY P J	6005	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	M58759 ASTHREEA JOSEPH	6007	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	M58387 ANDRA GRI	6008	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	M58524 BEENA KASHIM ADHAF	6009	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	M58603 DIVYA RAJAN	6010	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	M58576 DIVA THOMAS	6011	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	M58868 GOPHA K SHIBU	6013	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	M58587 LAKSHMI VEDYAN	6014	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	M58882 LENA VINCENT	6015	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	M58687 KOBBI MATHEW	6016	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	M58892 NIRMAL JOHNSON	6017	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	M58504 POOJA K PILLAI	6018	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	M58386 SANDRA P S	6019	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	M58633 SUNKAL M H	6020	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. Verification of attendance by students from Students login portal

Attendance Entry

Course: BCom Model I Finance & Taxation Semester: IV Sem-BCom Model I Date: 28/11/2019

Adm No	Name	Roll No	M1	M2	M3	M4	M5
<input type="checkbox"/>	K39290 AKSHAY JOSEPH	3901	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	K39496 ALEX JOHN	3902	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	K39272 ALSH SAJ J PRAGASH	3903	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	K39314 APAL GEO SCORY	3904	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	K39248 ANEESH NATH N	3905	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	K39291 ANRIN G PRATHYAM	3906	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	K39186 NARAJEZHIAN V	3908	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	K39526 JOJI M SAMUEL	3909	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	K39224 NETHEN SUDU	3910	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	K39194 NETHUNKUNAKKJ	3911	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	K39233 SABARU SASI	3912	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	K39218 ABILA PRATHAPAN	3913	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	K39176 AFNA N Y	3914	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	K39187 ADARSHVINEA MATHEW	3915	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	K39404 AKSHAYA SHYU	3916	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	K39346 ANJANA BABU	3917	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	K39310 ANITHA PIOUS	3918	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Reports

Student Details Attendance Hourly Attendance Day Wise Internal Mark Examination Faculty Examination Schedule Fee PD Accounts Class Room Management Time Table
 Performance Evolution Placement Academic Reports

Course: BA HInS Semester: I Sem-BA 15n
 Paper Name: FUNCTIONAL ASPECTS OF HINDI LANGUAGE Centre No: 30
 Status: Active Year: 2017
 Programme Name: CBCS

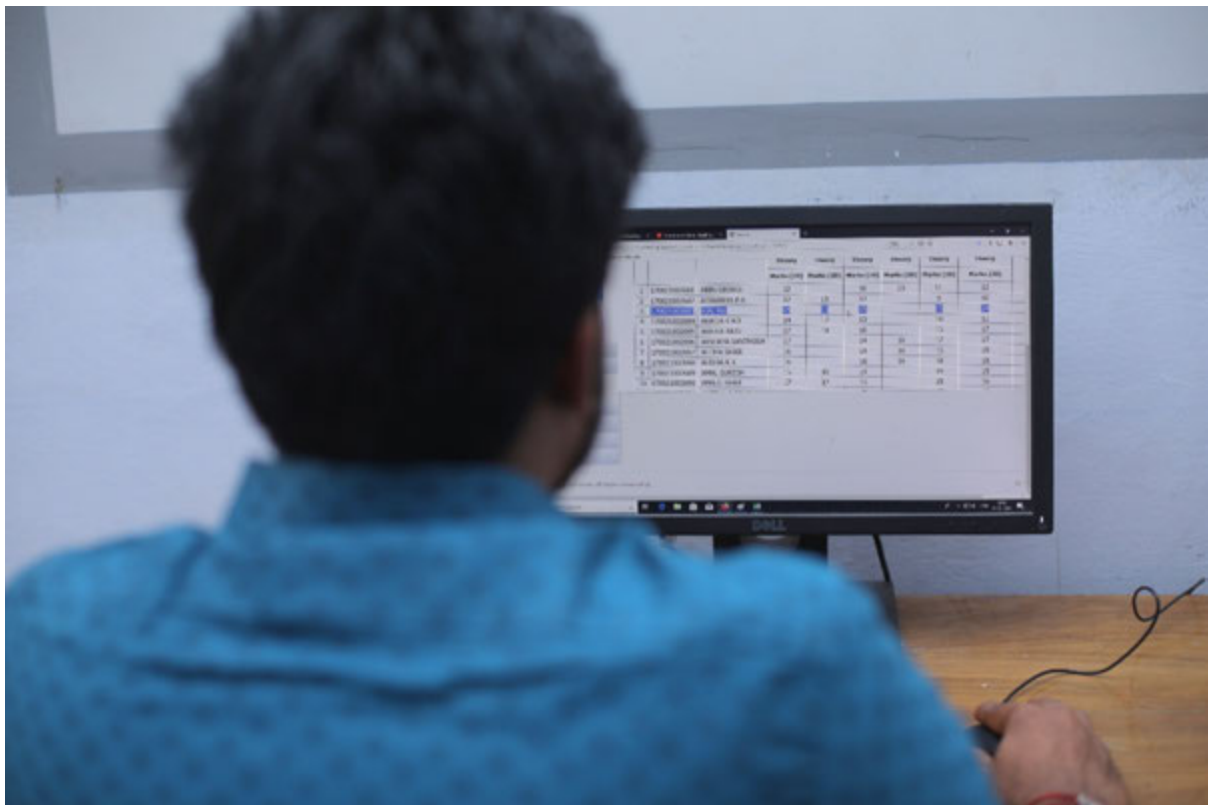
Export to the selected format Export

M G UNIVERSITY
INTERNAL ASSESSMENT(Theory) FOR U.G. PROGRAMME-CBCS(2017 ADMISSION ONWARDS)

Centre No : 30 College : Nimata College, Murumbuzha
 Semester : I Sem-BA Hn Programme : BA HInS
 Course Code : 18H1CM101 Course Title : FUNCTIONAL ASPECTS OF HINDI LANGUAGE

Sl. No.	Reg No.	Name of Candidate	Test 1	Test 2	Assignment/Seminar/Viva	Attendance		Grand Total	Remarks
			Max : 5 Marks	Max : 5 Marks	Max : 5 Marks	Days Present	% of Attendance Marks		
1	170021000901	AJIBOJEK, VALLIYATHI	0	0.21	2	32	87	4	6
2	170021000902	AISHA BEBEVA K H	2.4	3.44	5	39	100	5	16
3	170021000903	AJSHWATHYA SHAIJ	4	4.56	4	65	100	5	18
4	170021000905	AJIB C SHAIJ	4.1	4	4	61.5	92	5	17
5	170021000906	AMVITHA K C	2.6	3.66	3	68.5	99	5	18
6	170021000907	ANBESHANOCK JOHNSON	1.6	3.6	6	34	87	4	14
7	170021000910	ASHRAJ K BINU	1.5	3.63	3	30	94	5	13
8	170021000911	ASHRUA KASIKUMARI	3.7	2.87	6	42	92	6	17

14.Verification of internal marks by students from students login portal



16. Copies of Grievances received from students on CIE & Redressal to the same

From,
Teenu Shaji
Class III Z
Dept. of Zoology
10th September 2019

To,
Dr. Anil Kurian
H. O. D
Dept. of Zoology

Madam,

Subject: Permission to write a re-exam

I request you to give permission to write a re-test on the subject 'Environmental Biology and Human Rights' of IInd Internal Examination conducted on 5th September 2019, since I had to attend the funeral of my close relative. Kindly do the needed.

Yours Faithfully,

Teenu Shaji

Teenu Shaji

Permitted
Retest on Oct 23rd 2019
Anu

17. Circular about retest from Principal to the departments



28/07/2018

Those students, who were unable to write the internal exams due to any genuine reason shall give an opportunity to appear for retest, provided their application for grievance redressal is approved by the controller of examinations.

T. J. Joseph
Principal





NIRMALA COLLEGE MUVATTUPUZHA

Muvattupuzha P. O., Ernakulam Dist., Kerala - 686 661
Telephones: 0485 2832361, 2836300
e-mail: nirmalacollege@gmail.com, Website: www.nirmalacollege.ac.in

FOURTH CYCLE NAAC ACCREDITATION 2019

CRITERION 6

GOVERNANCE, LEADERSHIP AND MANAGEMENT

6.5.2 The institution reviews its teaching learning process, structures & methodologies of operations and learning outcomes at periodic intervals through IQAC set up as per norms

Comprehensive Result Analysis UG

<http://nirmalacollege.ac.in/uploads/2020/02/RESULT-ANALYSIS-UG.pdf>

Result Analysis PG

<http://nirmalacollege.ac.in/uploads/2020/02/RESULT-ANALYSIS-PG.pdf>

Submitted to



THE NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL



NIRMALA COLLEGE MUVATTUPUZHA

Muvattupuzha P. O., Ernakulam Dist., Kerala - 686 661

Telephones: 0485 2832361, 2836300

e-mail: nirmalacollege@gmail.com, Website: www.nirmalacollege.ac.in

FOURTH CYCLE NAAC ACCREDITATION 2019

CRITERION 6

GOVERNANCE, LEADERSHIP AND MANAGEMENT

6.5.1 Internal Quality Assurance Cell (IQAC) has contributed significantly for institutionalizing the quality assurance strategies and processes

**Audit Practice
Academic Administrative Audit 2014-15**

Submitted to



THE NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL

26@j

YAHOO! MAIL
INDIA Classic

Nirmala College - academic audit

7 February, 2015 12:57 PM

From: "Jacob John" <jjkattakayam@yahoo.com>

To: vnedungattu@yahoo.in

1 File (24KB)



Nirmala ...

Dear Rev Fr. Vincent Nedungattu,

If u require any clarifications, pl feel free to call me.
With warm regards and best wishes
John Kattakayam

Jacob John Kattakayam
Professor Emeritus
Dept. of Sociology, University of Kerala
Karyavattom, Trivandrum 695 581, India

(Former Director, UGC Academic Staff College & Dean, Faculty of Social Sciences University of Kerala, Former Member ICSSR, Immediate Past President of Indian Sociological Society, New Delhi)

Mob: +91-9447711122
Email: jjkattakayam@yahoo.com, jjkattakayam1@gamil.com

Resi: K - 37, Kailas Nagar, Pattom
Trivandrum 695004, India
Ph: 0471 - 2448650, 2446592



Please consider our environmental responsibility before printing

Save Paper & Save Trees

**ACADEMIC / DEPARTMENTAL AUDIT
NIRMALA COLLEGE, MUVATTUPUZHA**

MCA	
Strength	<ul style="list-style-type: none"> ➤ 60 students ➤ Online teaching method ➤ Higher percent of students opting for higher studies
Weakness	<ul style="list-style-type: none"> ➤ Lack of permanent faculty ➤ Limited exposure of teachers as seminar presentations
Opportunity	<ul style="list-style-type: none"> ➤ Collection of feed backs from students ➤ Aspiring students for higher studies
Challenges / Suggestions	<ul style="list-style-type: none"> ➤ Having permanent faculty ➤ Maintaining decreasing demand ration for the course ➤ Ensuring placement of students at an average level ➤ Details of refresher / orientation course attended by the faculties may be furnished
BOTANY	
Strength	<ul style="list-style-type: none"> ➤ Participation in science congress ➤ Annual science exhibitions ➤ Maximum exposure to the students through invited lectures and seminars ➤ Furnished details about campus flora, botanical garden and herbal garden ➤ Good success rate and pass percentage
Weakness	<ul style="list-style-type: none"> ➤ Majority of faculty do not have Ph.D ➤ Lack major projects ➤ Publication is done only by a few faculty ➤ No details about diversification of teaching method adopted
Opportunity	<ul style="list-style-type: none"> ➤ Certificate course ➤ Increasing demand for the subject ➤ Feedback from students and parents ➤ Students' progression to higher studies
Challenges / Suggestions	<ul style="list-style-type: none"> ➤ Faculty improvement ➤ Increasing publication of all faculty members ➤ Combating dropout rate ➤ Obtaining major research projects ➤ Collaborative efforts ➤ Details of refresher / orientation course attended by the faculties may be furnished

CHEMISTRY

Strength	<ul style="list-style-type: none"> ➤ Research center ➤ Tutorial system ➤ Remedial coaching ➤ ICT enabled teaching ➤ Funded research projects
Weakness	<ul style="list-style-type: none"> ➤ Faculty publication ➤ Collaborative research efforts ➤ Lack output of research scholars
Opportunity	<ul style="list-style-type: none"> ➤ Highly qualified faculty ➤ Invited lectures and paper presentations by experts in the field. ➤ Exposure of faculties at international level
Challenges / Suggestions	<ul style="list-style-type: none"> ➤ Maintaining student progression and success ratio ➤ Student placement ➤ Details of refresher / orientation course attended by the faculties may be furnished

COMMERCE

Strength	<ul style="list-style-type: none"> ➤ Conducting of add-on-courses & certificate programme. ➤ Increasing demand ratio of programmes – B.Com & M.Com. ➤ Tutorial system, remedial coaching
Weakness	<ul style="list-style-type: none"> ➤ A few faculties hold Ph.D
Opportunity	<ul style="list-style-type: none"> ➤ Recognized research centre ➤ Handful number of research scholars ➤ Consultancy services by faculties ➤ Department library
Challenges / Suggestions	<ul style="list-style-type: none"> ➤ Increasing publication of faculty members and research scholars ➤ Publication details of the research scholars in the department is not given ➤ Fund generated by the department through consultancies may be indicated to analyse the level of advantage of the consultancy works. ➤ Details of refresher / orientation course attended by the faculties may be furnished

COMMUNICATIVE ENGLISH

Strength	<ul style="list-style-type: none"> ➤ Innovative step towards having campus radio ➤ Training in short film & documentary making ➤ Having monthly newsletter
Weakness	<ul style="list-style-type: none"> ➤ Nor projects or collaborative efforts by the department ➤ No faculty member has Ph.D
Opportunity	<ul style="list-style-type: none"> ➤ Campus radio – “campus beat”

	<ul style="list-style-type: none"> ➤ Internship may increase more students to choose this subject
Challenges / Suggestions	<ul style="list-style-type: none"> ➤ Give faculty details on: <ul style="list-style-type: none"> ○ paper presentations ○ book & article publication ○ seminars organized ○ as resource person ➤ Report of the department ignore many of the aspects in its profile, pls include atleast vital information. ➤ Details of refresher / orientation course attended by the faculties may be furnished

ECONOMICS

Strength	<ul style="list-style-type: none"> ➤ All faculties having major/minor projects. ➤ Stable demand ratio of the course ➤ Remedial coaching for slow learners
Weakness	<ul style="list-style-type: none"> ➤ Only one has Ph.D as the highest qualification among the 11 faculties. ➤ Lacking field exposure to students like visiting doing internship industrial units & corporate units.
Opportunity	<ul style="list-style-type: none"> ➤ Research facilities in the department
Challenges / Suggestions	<ul style="list-style-type: none"> ➤ Conducting seminars / workshops regularly ➤ Need to increase in the number of faculty publications ➤ Found no details of the seminars / workshops organized during the last 2 years. ➤ IQAC may be implemented in the department. ➤ Details of refresher / orientation course attended by the faculties may be furnished.

ENGLISH

Strength	<ul style="list-style-type: none"> ➤ Increasing demand ration of the subject ➤ Remedial coaching ➤ Various students oriented programmes to improve their employability
Weakness	<ul style="list-style-type: none"> ➤ Limited Ph.D among faculty members ➤ Seminar / workshop organisations are less in number ➤ No research guide in the department ➤ No details of the language lab ➤ Absence of minor/major research projects
Opportunity	<ul style="list-style-type: none"> ➤ Number of faculty members
Challenges / Suggestions	<ul style="list-style-type: none"> ➤ More details of the language lab need to be furnished ➤ Teachers may be encouraged to avail research projects & extension activities

MALAYALAM

Strength	<ul style="list-style-type: none">➤ Good faculty strength➤ Feed back system (form students & parents)➤ Encouragement to students' publication➤ Research projects by faculty members.➤ Collaborative efforts
Weakness	<ul style="list-style-type: none">➤ Senior faculties have no Ph.D➤ Teachers may be encouraged to publish & take major projects
Opportunity	<ul style="list-style-type: none">➤ Faculty & students' publication➤ ICT enabled teaching and resources
Challenges / Suggestions	<ul style="list-style-type: none">➤ Increasing the pass percentage in PG level➤ Equip student in competing NET exam.➤ Maintaining the high placement ratio➤ Give details of droop out rate➤ Need to encourage community level extension activities of the students

MATHEMATICS

Strength	<ul style="list-style-type: none">➤ Higher students success ratio➤ Remedial coaching➤ Feedback mechanism
Weakness	<ul style="list-style-type: none">➤ No faculty members possess Ph.D
Opportunity	<ul style="list-style-type: none">➤ Alumni association➤ Consultancy services➤ Higher placement record
Challenges / Suggestions	<ul style="list-style-type: none">➤ Decreasing number of students getting admitted.➤ Use of advanced teaching aids➤ Faculties may be encouraged to undertake projects.➤ Income generated through consultancy services may be furnished

MCA

Strength	<ul style="list-style-type: none">➤ Have abundant number of books in the departmental library➤ International journals – 12➤ Seminars organized➤ Seminars attended by faculties.➤ Greater contribution by the department to make the campus techno-friendly
Weakness	<ul style="list-style-type: none">➤ No faulty member possesses Ph.D➤ Lack of major / minor research projects
Opportunity	<ul style="list-style-type: none">➤ Industrial visits➤ Consultancy services➤ Higher success ratio of students

Challenges / Suggestions	<ul style="list-style-type: none"> ➤ Faculty publications need to be increased ➤ Value of money generated through consultancy services may be audited; should be briefed in the report.
---------------------------------	---

PHYSICAL EDUCATION

Strength	<ul style="list-style-type: none"> ➤ Alumni members as international players ➤ Faculties serve as resource persons, experts etc
Weakness	<ul style="list-style-type: none"> ➤ Absence of women physical education trainer
Opportunity	<ul style="list-style-type: none"> ➤ Avail financial aid from central government for better training. ➤ Hosting & participation in major events ➤ Research aptitude exerted by the faculties.
Challenges / Suggestions	<ul style="list-style-type: none"> ➤ Innovative programme with long term objectives ➤ Diversified importance to different games.

PHYSICS

Strength	<ul style="list-style-type: none"> ➤ Community extension activities ➤ Approved research guides
Weakness	<ul style="list-style-type: none"> ➤ Having no MSc programme and research centre ➤ Less research projects undertaken
Opportunity	<ul style="list-style-type: none"> ➤ Handful of publications by faculty members. ➤ Extension research & activities. ➤ Good infrastructure & learning resources
Challenges / Suggestions	<ul style="list-style-type: none"> ➤ Faculty research / Ph.D ➤ Introducing an M.Sc programme ➤ M.Sc may be introduced ➤ Publication is limited to a few faculty

HINDI

Strength	<ul style="list-style-type: none"> ➤ High profile of the faculty members (7 Ph.Ds) ➤ Feedback system ➤ High student success rate both in UG & PG
Weakness	<ul style="list-style-type: none"> ➤ No details about faculty profile
Opportunity	<ul style="list-style-type: none"> ➤ Approved research centres
Challenges / Suggestions	<ul style="list-style-type: none"> ➤ Faculty participation in national seminars ➤ No ongoing research projects by faculties

STATISTICS

Strength	<ul style="list-style-type: none"> ➤ M.Sc programmes & training in statistical package to students ➤ Seminar & workshop organization by the department ➤ Good number of international publication by faculty members
Weakness	<ul style="list-style-type: none"> ➤ Lack of research projects
Opportunity	<ul style="list-style-type: none"> ➤ Recognized research centre

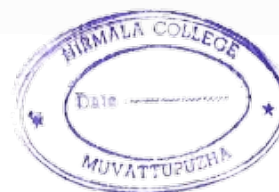
	<ul style="list-style-type: none"> ➤ Membership in professional bodies ➤ Placements of students
Challenges / Suggestions	<ul style="list-style-type: none"> ➤ Increasing placements ➤ Consultancy and collaborative efforts may be given more emphasis.

ZOOLOGY

Strength	<ul style="list-style-type: none"> ➤ Having both B.Sc & M.Sc programme ➤ Higher intake from rural area & are mostly girls ➤ Tutorial system & special attention to advanced learners
Weakness	<ul style="list-style-type: none"> ➤ No major projects undertaken yet ➤ Limited publications by faculty members
Opportunity	<ul style="list-style-type: none"> ➤ Certificate course ➤ Regular invited talks ➤ Post admission test to know the strength ➤ Feedback from students, alumni & parents
Challenges / Suggestions	<ul style="list-style-type: none"> ➤ Faculty wise research projects should be given ➤ Money generated through consultancy works may be furnished ➤ Teachers may be encouraged to avail projects

(Handwritten Signature)

PRINCIPAL
NIRMALA COLLEGE
MUVATTUPUZHA





NIRMALA COLLEGE MUVATTUPUZHA

Muvattupuzha P. O., Ernakulam Dist., Kerala - 686 661

Telephones: 0485 2832361, 2836300

e-mail: nirmalacollege@gmail.com, Website: www.nirmalacollege.ac.in

FOURTH CYCLE NAAC ACCREDITATION 2019

CRITERION 6

GOVERNANCE, LEADERSHIP AND MANAGEMENT

6.5.1 Internal Quality Assurance Cell (IQAC) has contributed significantly for institutionalizing the quality assurance strategies and processes

**Audit Practice
Academic Administrative Audit 2017-18**

Submitted to



THE NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL

Report of the Academic Auditing held at Nirmala College Muvattupuzha on 06 and 10 November 2017 by the Management constituted committee consisting of Rev. Msgr. (Dr.) Cherian Kanjirakombil (Chairman), Rev. Dr. George Thanathuparambil (Secretary) and Rev. Dr. Gilson John CMI (NAAC Peer Team Member).

GENERAL OBSERVATIONS

The committee is pleased to register its happiness over the strenuous efforts taken by all teachers under the leadership of the IQAC co-ordinator in arranging facts and figures in a meticulous manner. The presentations, with a few exceptions, were superb. Hospitality and general ambience was good. Still, it is better to keep the following points in mind while presenting yourselves before the real NAAC peer team.

1. Remember that the team is always time conscious. The PPT presentation should not exceed seven minutes. The presentation should be arranged in such a way that the strength of the department is communicated to the team in the first minute itself. The slides should be legible, clear and unambiguous with very minimum words. At the end, the team should get an impression that more things are left unsaid.
2. An interactive environment should prevail in the room. The team should get a feel that all teachers are involved in the process in one way or the other.
3. Criterion wise presentation is advisable. Only the strong points in each criterion need to be enumerated. While presenting the points, the thrust areas of the accreditation process should be kept in mind.
4. Avoid reading the slides verbatim. Translate the slides in your own language with very limited words.
5. Avoid negative comments about the situation prevailing in the institution, even if they are factual. You can convert an inadequacy as a proposition.
6. Don't offer lame excuses for your failures or inadequacies. Instead, convey your determination to improve the situation.
7. Campus- community partnership is a thrust area of NAAC. Therefore, any activity which can claim a linkage with the neighbourhood should not go unnoticed.
8. Grievance redressal mechanism should be put in place at the department level. Keep a record of action taken report on each complaint received.
9. Collaborations with other establishments/ institutions should be given due projection. Keep an account of income generated and the purpose for which the money has been utilised.
10. Every teacher is expected to keep record of activities done in the Personal diary in a serious and systematic manner.

11. Each department is required to make a SWOC (strength, weakness, opportunities, challenges) analysis
12. Avoid spelling mistakes on the slides
13. It is better to conclude the presentation with a future plan.

CRITERIA WISE OBSERVATIONS

I. Curricular Aspects

1. The focus can be on what extra you are giving to the students. Therefore, the add-on programmes, certificate courses, skill training, spoken English/ Hindi classes, value education etc. which are given outside the prescribed University syllabus can be projected. All departments cansay how they are motivating the students to make use of the facilities in the Language Lab, Computer Lab and Library.

II. Teaching, Learning and Evaluation

1. The programme specific outcome and course outcome have to be delineated. A mechanism be put in place to examine the attainment levels in terms of knowledge, skill, attitude, and values of students. In case the attainment level is found to be short of expectation, explain what remedial measures are initiated.
2. Highlight measures like remedial classes, bridge courses and personal counselling imparted to the benefit of disadvantaged learners, with proper documentary evidences.
3. Convince the team that the department has the practice of preparing teaching plan and academic calendar.
4. Establish the facts that the students are accessing e-learning platforms like MOOC, e-Patashala, Google class room etc; with documentary support.
5. Prove that the departments are providing incentives to advanced learners in terms of scholarships, mentoring, career guidance, academic counselling etc. with sufficient evidences.
6. Establish that we are practicing innovative methods like problem based learning, case studies, field trips, group discussions, e-learning, web based assignments etc. in tune with the technological advancements taking place in the larger world.
7. Also, show that we are providing ICT enabled education with the help of multimedia, simulation, power point etc.
8. Convince the team that our pedagogy is more student centric rather than teacher centric. Therefore, we have to project that we have a vibrant student life on the campus full with activities like competitions, debates and programmes.
9. Substantiate that we have an excellent feedback mechanism through which we consult all stake holders like students, parents, alumni, employers and academic peers

on our teaching learning process to improve the quality of our services. Documentary proof is essential.

10. Prove that we have a transparent evaluation system and grievance redressal mechanism to address the complaints of students on the quality of evaluation.
11. Prove that we are arranging so many external academic lectures for the benefit of students. You can list out the prominent scholars who have interacted with your students.
12. Establish that your academic results are far better than the University average for each programme.
13. Substantiate that meritorious students are seeking admission in your department and there is only very limited dropout rate.

III. Research Innovation and Extension

1. All publications of teachers, irrespective of the period of publication, can be displayed; because it adds to the quality of our teachers. But only the publications of 2013-2017 period be included in the SSR or PPT.
2. Published seminar proceedings also can be included.
3. Convince that the college management is giving sufficient incentives and encouragement to research and extension activities, such as financial support to organise seminars and lectures, duty leave for attending seminars, registration fee for seminars/ conferences and promotion to do Ph.D. and Research projects.
4. Financial resources mobilised out of research projects and extension activities should be highlighted.
5. Number of Ph.Ds awarded from research departments should be highlighted.
6. Orientation and training given to students on developing research aptitude like project works, field visits, nature camps, exposure visits to research institutions motivation to attend seminars and workshops also could be highlighted.

IV. Infrastructure and Learning Resources

1. Claim that you have state of the art facilities for ICT enabled education with adequate number of electronic gadgets like computers, LCD Projectors etc and they are optimally used by the student community.
2. The Number of books and journals related to your subject available in the library can be given attention to.
3. The practice of maintaining departmental libraries may be done away with. All books should be kept in the central library, extending access to all teachers and students, irrespective of their subject of study.

4. The physical infrastructure in the class rooms and laboratories like fans, television screens, LCD Projectors, Lab equipment can also be explained.
5. The wi-fi facility, if available, in the Labs and library will add to our credentials.
6. The students should be encouraged to access e-resources like INFLIBNET.

V. Student Support and Progression

1. Prestigious scholarships like INSPIRE, Prathibha, Suvarna Jubilee, Single Girl Child etc. should be highlighted along with other scholarship/ grants awarded.
2. Convince that you have a mechanism to prompt the students to apply for scholarships and grants.
3. Coaching classes for NET/ JRF and competitive examinations, career counselling and placement drives can be highlighted.
4. Efforts to motivate students in activities like NSS, NCC, Debates, Sports and Cultural events can be given due weightage.
5. The number of outgoing students proceeded to higher studies and jobs can be projected.
6. The profile of the prominent alumni will strengthen your argument that the department has a good progression rate.
7. You can take credits for the achievements of your students in NSS, NCC, sports, arts etc, as well.
8. Mechanisms for poor aid, remedial coaching, mentoring, grievance redressal, tutorial, counselling also should be delineated

VI. Governance, Leadership and Management

1. Project that democracy exists in your decision making process at the department level. Details of staff meeting, academic plan, work distribution, time table preparation should be explained.
2. Establish that you are getting sufficient support from the management for your academic and infrastructural development.
3. Annual financial plan and future plan also should be prepared.
4. Alumni contribution in any form is to be projected as a welcome trend.

VII. Best Practices

1. Departmental practices like manuscript magazines, feedback mechanism, online submission of assignments, add on courses, plastic shredding, mushroom farming, NET coaching, charity fund, book banks, maintenance of botanical/ spice/ butterfly gardens can be included.

2. The Commerce and Economics departments can keep a notice board outside their staff rooms indicating the currency exchange rates and stock indices with daily updates.
3. The English departments can arrange debates in English, screening of English films, facilities for listening BBC news etc.
4. Peer teaching can be introduced in all departments as a best practice.
5. Computer Science departments can take up computer literacy programmes for the local people in the neighbourhood.

CONCLUSION

The attempt, in this academic auditing, was just to assess the inherent strength and weaknesses of each department. The team, therefore, gave a patient attention to what is in store for you. Obviously, we did not get time to verify the files/ documents presented before us. We intend to constitute another team for verifying and validating the available data. Probably, we will have another mock visit in the next semester.

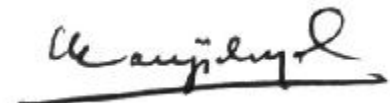
We are impressed with the performance of individual departments/ units and the college as a whole. But, still there is room for improvement. We hope, in the days to come, all segments of the college will work united and tirelessly towards the ultimate goal of maintaining desirable standards in the educational services of the institution.



Dr. Gilson John CMI
External Member



Fr. Dr. George Thanathuparambil
Secretary



Mgr. Dr. Cherian Kanjirakompil
Chairman



NIRMALA COLLEGE

MUVATTUPUZHA

ACADEMIC AND ADMINISTRATIVE AUDIT 2018-19

[Dates: October 5 & 6, 2018]

Audit Team

SL. NO	NAME	DESIGNATION
1	Dr. Ignacimuthu S J	Former Vice Chancellor, University of Madras
2	Dr. Suresh Mathew	Professor, School of Chemical Sciences, MG University
3	Dr. Jacob John Kattakayam	Former Director, Academic Staff College, Trivandrum

General Observations

1. Departments have to modify their department profile to include the certificate courses and value added courses offered. The departmental best practices can also be included.
2. In addition to the result analysis of the IQAC, departments have to do in depth course wise result analysis by comparing the results with university averages.
3. The minutes book of some departments do not reflect the activities undertaken by them. Department minutes book should include agenda, resolutions and action taken reports.
4. The activities of the departments should be displayed in the website.
5. A hand book of POs, PSOs and COs shall be prepared department wise.
6. The profiles of faculty should be given in the website.
7. Departmental academic plans should be given on the department notice boards.
8. Departments should prepare a three-year strategic plan.
9. There should be separate file for student progression and placements.
10. The department advisory committee should review the attainment of course outcomes.
11. The syllabus for remedial and bridge courses should be updated.

Significant Achievements

1. Digitalisation of Teaching and Learning Process
2. MHRD approved Institutional Innovation Council
3. Implementation of Green Protocol for the college
4. Swachhta Ranking Team visit 2018 and 2019(Only 3 colleges included from the state)
5. Institutional subscription to Plagiarism software
6. New research centre in English Department.
7. Teachers ventured into e-learning and digital content creation.

I. Curriculum Aspects

- a. UGC sponsored B.Voc Programme in Logistic Management started
- b. Four new employability focussed certificate courses are introduced.
- c. 294 students got enrolled in newly introduced certificate courses. This number can be further increased.
- d. The number of job oriented certificate courses shall be increased.
- e. There should be more field based inquiry in the curriculum delivery.
- f. Though the college offers a value education course to the entire students, proper documentation of the same is not done.
- g. The online mechanism adopted for 360^o feedback is good.
- h. More FDPs shall be organised for newly introduced courses.

II. Teaching, Learning and Evaluation

- a. The demand ratio for the programmes is very high and it shows the brand equity of the institution.
- b. The action taken report of result analysis should be maintained by the departments.
- c. The institution has a mentoring and remedial policy in place.

- d. The syllabus of remedial teaching should include the basics the subject.
- e. The improvements through remedial coaching can be filed by departments.
- f. The institution employs new methods of evaluation such as online quiz, book review, etc.
- g. PAT should be implemented at UG level also.
- h. IQAC should take appropriate steps to improve the pass percentage above 90%.
- i. The teachers use MOODLE and Google Classroom platforms for effective teaching.
- j. An online question bank is made available to the students.

III. Research, Innovations and Extensions

- a. The college received funds amounting to nearly 6 lakhs during the academic year.
- b. 14 PhDs have been produced by the research centres.
- c. Postgraduate department of English got elevated as research department.
- d. 48 new publications in UGC listed journals.
- e. Institution subscription to plagiarism software.
- f. Students projects should have plagiarism free certificate.
- g. The performance of the college on extension activities is outstanding.
- h. Better documentation is needed for internship projects and MoUs.
- i. The College has been sanctioned a whopping sum of Rs.2 crore under the RashtriyaUchatarShikshaabhiyan (RUSA).
- j. The Union Government has selected the college for the Unnat Bharat Abhiyan (UBA), by which the college is entrusted to carry out community services in five neighbouring villages. The grant is to the tune of Rs.50000 for each village per year.

IV. Infrastructure and Learning Resources

- a. The administrative office of the college is now shifted to state-of-the art building newly constructed.
- b. The campus has now got two beautiful gateways for restricting the trespassers.
- c. Extension new block
- d. Opened the Mini Theatre on the campus
- e. Seminar halls, class rooms, LCD projectors are newly added.
- f. New library software KOHA introduced.
- g. Digital library facility and e-learning centre added.
- h. The class rooms should be 100% ICT supported.
- i. There should be provision for lift.
- j. There should be Central server facility in the college.
- k. 1600 new books and 9 new journals are added to the central library.
- l. Bandwidth upgraded to 200 mbps.
- m. The college has spent more than Rs. 2 crores for academic and physical facilities during 2018-19.

V. Student Support and Progression

- a. 196 students got placement.
- b. The college should conduct more in house placement drives.
- c. The college should showcase prominent alumni list.
- d. Departments should highlight winners in NET/JRF examinations.
- e. There should be a register for placement and student progression department wise.
- f. There should be a list of e-grant awardees in the department.
- g. The NSS unit of Nirmala College is bestowed with Best NSS Unit award for its achievements in 2017-2018.
- h. Students should be encouraged to participate in seminars and conferences.
- i. The college should increase the student progression to above 40%.

VI. Governance, Leadership and Management

- a. Strategic plan for 2019-20 should be prepared in tune with the RAF.
- b. The comments made by the students should be brought into the managing board.
- c. There should be remedial measures on the feedback on curriculum and institutional performance and the same should be communicated to the students.
- d. The participation in peer evaluation shall be increased.
- e. The coverage of e-governance shall be enhanced.
- f. Computer literacy of the non-teaching staff can be improved.

VII. Institutional Values and Best Practices

- a. The college has many best practices. The college has institutionalised Nirmala Hastahm and Digi-Campus initiatives.
- b. The college is distinctive in college greenery, oxygen park, swachh campus initiatives, etc.
- c. The departmental best practices should be highlighted in their presentations.

Conclusion

Though NAAC has not suggested any criteria for AAA audit, we have taken NAAC criteria in the RAF for this academic auditing. From the rigorous evaluation, we understand that the performance of the college is impressive in all aspects. The areas where the college needs improvement are indicated in the general observations. Currently the college conducts academic audit every two year. It should be done every year.

SL. NO	NAME	DESIGNATION	SIGNATURE
1	Dr. Ignacimuthu S J	Former Vice Chancellor, University of Madras	
2	Dr. Suresh Mathew	Professor, School of Chemical Sciences, MG University	
3	Dr. Jacob John Kattakayam	Former Director, Academic Staff College, Trivandrum	



Academic Administrative Audit 06 October 2018



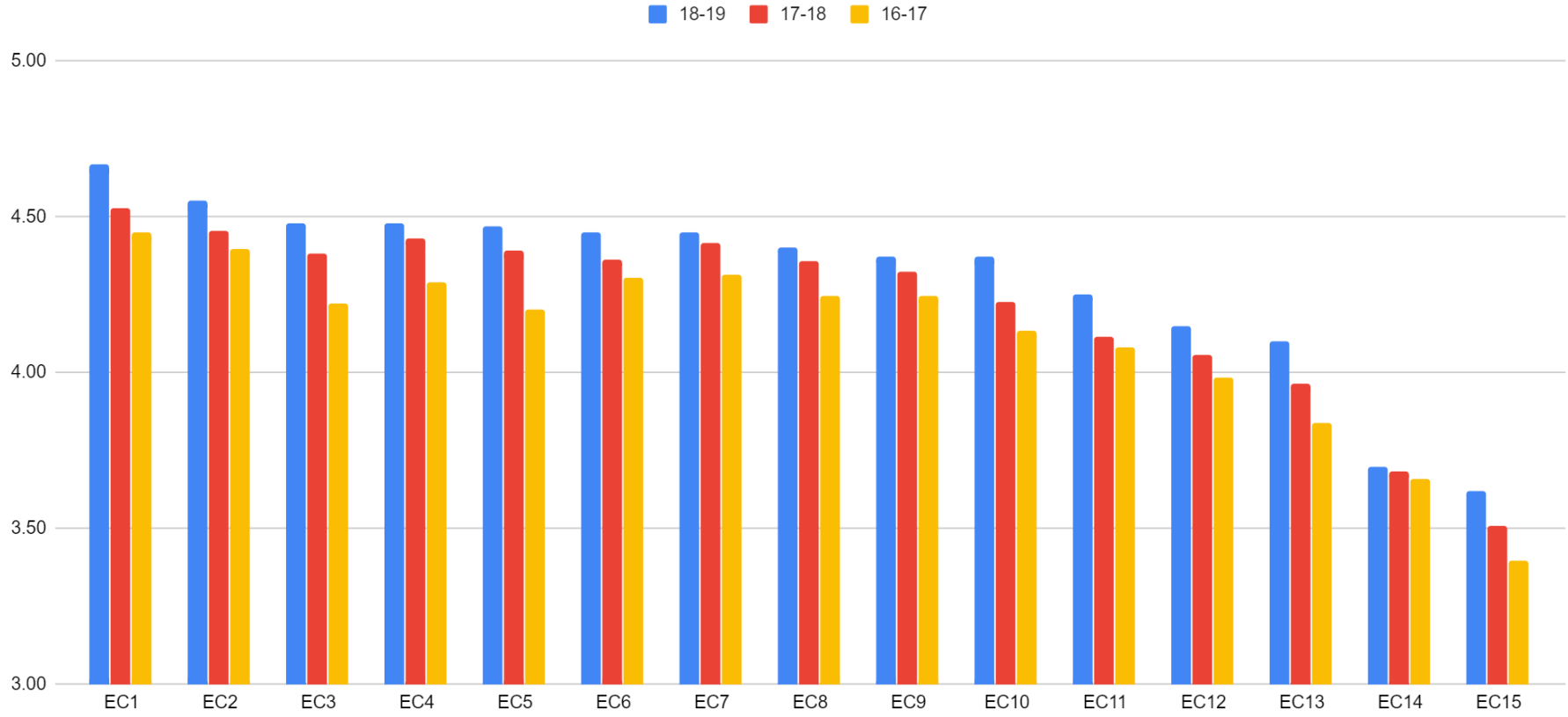
Academic Administrative Audit 06 October 2018



Peer Evaluation 2016-19

Peer Evaluation Results	Year			
	Code	2018-19	2017-18	2016-17
The teacher is friendly with his/her colleagues and co-operative in all the activities of the Department	EC1	4.67	4.50	4.47
Keeps an attitude of fairness, courtesy and respect	EC2	4.55	4.45	4.33
Completes the evaluation of answer books in a timely manner	EC3	4.48	4.41	4.39
The teacher is keen in inculcating moral values among students	EC4	4.48	4.36	4.22
Recognizes and responds appropriately when an individual student is having social and/or emotional difficulties which interfere with learning and/or participation in class	EC5	4.47	4.46	4.32
The teacher is a good tutor and motivator	EC6	4.45	4.40	4.38
The teacher is concerned with the progression and success of the student	EC7	4.45	4.33	4.23
Keeps punctuality	EC8	4.40	4.37	4.33
Makes fair evaluation of the student	EC9	4.37	4.20	4.06
Updates the subjects as per changing curriculum]	EC10	4.37	4.32	4.26
Keeps abreast of current developments in the topics covered	EC11	4.25	4.13	4.03
Makes time available for interaction with the students outside the class room	EC12	4.15	4.13	4.09
Active in participating in curricular, co-curricular and extracurricular activities of the college	EC13	4.10	4.06	3.89
Participates / organizes Seminars / Symposia / Workshops at state / National / International level	EC14	3.70	3.59	3.58
Has enough contribution in research / consultancy	EC15	3.62	3.51	3.47

Peer Evaluation Results



Peer Evaluation Overall Score :



Peer Evaluation Analysis 2016-19

IQAC introduced Peer Evaluation as an effective method to evaluate and to offer corrective measures to the faculty members based on their performance. This online evaluation process was introduced by the IQAC in the academic year 2016-2017. The evaluation is based on fifteen criteria which analyse/evaluate the academic performance, research activities, individual qualities, participation in curricular and co-curricular extra-curricular activities, participation in/ Organising of Seminars, Symposia, workshops at State/ National/International level etc. Considerable improvement in the performance of the teachers has been noticed in the consecutive years as a result of this system of evaluation and the corrective measures suggested. IQAC has identified Research and Consultancy as the areas which need improvement. IQAC has taken serious steps to encourage the faculty members to do active research. Teachers are motivated to submit research proposals to various agencies and to avail funds for research. The Research Promotion Council of the college, under the guidance of the IQAC monitors this process. Teachers are also encouraged to publish research articles in recognised journals, present research papers in national and international seminars, conferences, workshops etc., to do major and minor research projects etc. Students are also encouraged to avail scholarships for research.

IQAC Coordinator



Principal

PRINCIPAL
NIRMALA COLLEGE
MUVATTUPUZHA



Green Auditing

Nirmala College, Muvattupuzha



CMJ Eco Associates

Forum for Ecological Analyses

2016-2017

Executive Summary

Green audit is **defined** as an official examination of the effects a college has on the environment. It helps to improve the existing practices with the aim of reducing the adverse effects of these on the environment concerned. Several institutions have applied various view points to preserve the environment within the campus such as promotion of energy savings, recycling of waste, water use reduction, water harvesting etc. Green audit visualizes the documentation of all such activities taking stock of the infrastructure of the college, their academic and managerial policies and future plans. A green auditor will study an organisation's environmental effects in a systematic and documented manner and will produce an environmental audit report. A clean and healthy environment aids effective learning and provides a conducive learning environment.

Green audit can be a useful tool for a college to determine how and where they are using the most energy or water or resources; the college can then consider how to implement changes and make savings. It can also be used to determine the type and volume of waste which can be used for a recycling project or to improve waste minimization plan. It can create health consciousness and promote environmental awareness, values and ethics. It provides staff and

students better understanding of green impact on campus. Green auditing promotes financial savings through reduction of resource use. It gives an opportunity for the development of ownership, personal and social responsibility for the students and teachers. Thus it is imperative that the college evaluate its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more relevant.

In Nirmala College, Muvattupuzha the audit process involved initial interviews with management to clarify policies, activities, records and the co-operation of staff and students in the implementation of mitigation measures. Staff and students were given training how to collect the data for the green audit process. This was followed by staff and student interviews, collection of data through the questionnaire based survey, review of records, observation of practices and observable outcomes. In addition, the approach ensured that the management and staff are active participants in the green auditing process in the college.

The baseline data prepared for the Nirmala College, Muvattupuzha will be a useful tool for campus greening, resource management, planning of future projects, and a document for implementation of sustainable development of the college. Existing data will allow

the college to compare its programs and operations with those of peer institutions, identify areas in need of improvement, and prioritize the implementation of future projects. The green audit reports assist in the process of attaining an eco friendly approach to the sustainable development of the college. Hope that the results presented in the green auditing report will serve as a guide for educating the college community on the existing environment related practices and resource usage at the college as well as spawn new activities and innovative practices. We expect that the management will be committed to implement the green audit recommendations.

We are happy to submit this green audit report to the authorities of Nirmala College, Muvattupuzha.

22nd May, 2017

Dr. C.M. Joy
Honorary Secretary
CMJ Eco Associates
Forum for Ecological Analyses
Arafa Nagar, CUSAT P.O., Kochi-22
9447391905 jcheenikkal@gmail.com

CONTENTS

Executive Summary

Chapters

Page No

1. Introduction	1
1.1 Vision and Mission	
1.2 Objectives of the College	
1.3 Total Campus Area & College Building Spread Area	
1.4 Campus Infrastructure	
2. Pre-Audit Stage	9
2.1 Management's Commitment	
2.2 Scope and Goals of Green Auditing	
2.3 Benefits of Green Auditing	
2.4 Target Areas of Green Auditing	
2.5 Methodology of Green Auditing	
2.6 Survey Forms	
3. Audit Stage	25
3.1 Students and Staff Involved in Green Auditing	
3.2 Student Clubs and Forums Involved	
3.3 Comments on Site Tour	
3.4 Review of Documents and Records	
3.5 Review of Policies	
3.6 Interviews	
3.7 Site Inspection	
4. Post Audit Stage	31
4.1 Key Findings and Observations	
4.2 Evaluation of Audit Findings	
4.3 Consolidation of Audit Findings	
4.4 Preparation of Action Plan	
4.5 Environmental Education	
4.6 Conclusion and List of Recommendations	
5. Exit meeting	78
Acknowledgements	
Photographs	80

Chapter 1

Introduction

Nirmala College, Muvattupuzha established in 1953 and is now 64 years old. The college is a centre of higher learning in Ernakulam district with 16 undergraduate programs, 14 post-graduate programs, six research programs, and certificate & diploma programs. The college has played a pivotal role in the socio-economic development of the high ranges and the suburban areas of Muvattupuzha town. The forefathers of the college had envisioned the delivery of quality education wedded with spiritual values to the emerging young population of the region.

The college has 74 regular faculty members in various disciplines of whom 32 are Ph.D. holders. In addition the college has 68 teachers on ad-hoc basis. About 56% of the faculties are women. The total number of non-teaching staff comes to 52. The college has a total student strength of 2710 of which 64% are girls. Though the college is aided by the state government it also receives occasional funding from University Grants Commission (UGC), Department of Science and Technology (DST), Department of Bio-technology (DBT) and Kerala State Council for Science, Technology and Environment (KSCSTE). All

Science departments are DST-FIST supported. The Department of Biotechnology, Govt. of India has accorded the 'Star College' status to the college for three years (2017-2020). Under the scheme, the departments of Botany, Chemistry, Physics and Zoology get a one-time grant of Rs.5 lakh each and annual recurring grant of Rs.2 lakh each for three years. Several major and minor research projects are being carried out by the faculty. Some of the teachers have publications in accredited national and international journals with a high degree of impact factor and h-index. The college regularly undertakes consultancy works for the Rubber Board and the Coconut Board.

The College has a web-enabled Digital Library with over 65000 titles in various disciplines. The college is linked with the UGC sponsored INFLIBNET, enabling on-line access to over 2500 national and international research journals. The college is regularly publishing a bi-annual journal called "Science and Society" with ISSN number from 2003 onwards. The college regularly conducts 13 memorial or endowment lectures on an annual basis. It also organizes five inter-disciplinary national seminars and over 20 invited talks by experts every year, on an average.

The college is credited with the running of a Civil Service Academy on its campus. It provides effective coaching to the civil service aspirants on a regular basis. The integral development of student personality is taken care of by various clubs and units like National Service Scheme, National Cadet Corps, Debating Club, Quiz Club, Catholic Students Movement, Entrepreneurship Development Club, Human Rights Club, Anti-Narcotic Club, Road Safety Club etc.

The students have been consistently contributing to the ethos of the college through their outstanding performance in the University Youth Festivals,

Sports, Games and intellectual pursuits. They maintain high standards in University examinations with occasional ranks and distinctions.

The college gives due importance to the wholesome development of the human personality. In this perspective, we have facilities for computer training, yoga practicing, body building and spiritual renewal. The practice of reaching out to the entire college community through the public address system and educating on topics of common interest on a daily basis for five minutes through the programmes of 'Zero Hour' and 'Nirmala Radio' is a great opportunity for students to learn something beyond their prescribed syllabus. The recreational facilities like department day celebrations, inter-departmental competitions, Onam and Christmas celebrations and Food festival are the means of unearthing the best talents hidden in each student.

In addition, the college offers special training to advanced learners through the platforms of Walk With the Scholar and 'Nirmala Stars'. At the same time, the interests of slow learners are taken care of by the programmes like Scholar Support programme, Remedial Coaching, Peer teaching and Additional Skill Acquisition programme. UGC-NET coaching facility is given to the post-graduate students. The career guidance and placement cell is very active and has been successful in securing maximum campus placements for our students. The Parent Teacher Association and Alumni Association are also very active with many innovative programmes.

On infra-structural front, the college has state of the art facilities. It has five air conditioned conference halls, four auditoriums, six seminar halls, five computer labs, three smart class rooms, one language lab, nearly 250 computers with peripherals, six photocopying machines, 22 DLP Projectors and so on. Two Ladies' Hostels, Boys Hostel, Sports Hostel, Cafeteria, Post-office, Bank, Two ATM Counters, Kiosks, Staff Co-operative Society, Electronic workshop,

Gymnasium, Yoga Centre, Chapel, Counseling Centre, Book Stall and Stationery Shop are other facilities on the campus.

The college administration is assisted and advised by the Governing Body, IQAC, College Council, PTA, Alumni Association, and the College Union in its march ahead.

The emerging system of higher education demands increased importance to skill development in order to make our students more employable by acquiring necessary analytical and soft skills. Aptitude tests, group discussions, interviews, personality tests etc. have become essential components of any education system. Hence, students are encouraged to join clubs/associations for co-curricular activities and take maximum advantage of the facilities available. Let us develop a new culture of innovation and hard work with a firm desire and determination for achieving our goals. We have to be punctual and systematic, humble, sincere and honest. Let us nurture deep rooted values and faith in God along with an uncompromising search for truth, knowledge and excellence in all our endeavours.

The college community is preparing itself for the fourth cycle of accreditation by the NAAC. The IQAC of the college is in the field, grooming the ground for the next cycle of accreditation ever since the third accreditation of the college in 2013. Its focus is on ushering in a positive and qualitative change in the delivery of academic services in the college. The qualitative changes seen on the campus now are the result of concerted and dedicated efforts of the management, staff and students of this institution.

1.1 VISION AND MISSION

Institutional Vision

Academic excellence with integrity of character

Mission

Our mission is the integral development of personality based on Christian ideals. Though instituted primarily to satisfy the educational needs of the Christian community, its portals are ever open to all and it strives to cater to the needs of everyone, irrespective of caste and creed.

1.2 Objectives of the College

Nirmala College is committed to accomplish the following aims:

- Enable students to pursue knowledge with an insatiable thirst, discipline them to harness their energy for creative purposes, make them physically and mentally fit and competent for a career and equip them to be self supportive in life.
- Foster feelings of love, compassion and tolerance towards all and enable them to fight against all social evils. Encourage healthy interaction so that they place the common good of a larger community above their personal interests.
- Induce patriotic fervor and an unflinching pride in the national heritage and inculcate qualities of enlightened leadership, so that they become responsible citizens and good leaders of tomorrow.
- Encourage art, music, dramatics and other forms of creativity inherent in students, make them honour the dignity of labour and encourage service activities and extension programmes.
- Promote healthy staff student relationship and instill in them love and respect towards their parents, elders, people of authority and everyone worthy of respect. To sum up, the College looks forward to educate citizens who love God and serve humanity. The institution endeavours to help the youth to grow up competent, responsible and mature individuals with strength of character, moral uprightness and courage of conviction, imbued with qualities of the head and the heart.

1.3 Total Campus Area & College Building Spread Area

Campus area	214483.05 M²
Built up area	31164.89 M²

List of Places from Where Students Commute

Thodupuzha, Muvattupuzha, Pandappilly, Arakuzha, perumbavoor, kuravilangadu, Ernakulam, Kattapana, Kozhikode, angamaly, kalady, Malapuram, Moolamattom etc.

NAAC Grading in Assessments

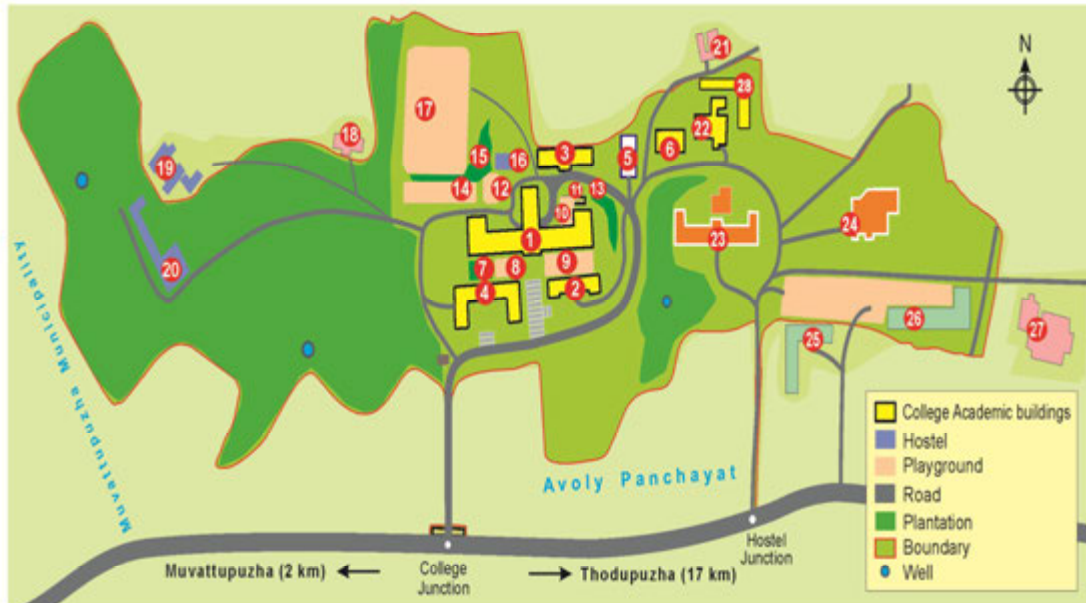
Sl. No.	Cycle	Grade	CGP A	Year of Accreditation	Validity Period
1	1 st Cycle		3*	1999	7 th Feb 2007
2	2 nd Cycle	B ⁺⁺	82.7	2007	31 st Mar 2012
3	3 rd Cycle	B	2.85	2013	22 nd March 2018

1.4 Campus Infrastructure

- ❖ Main Block
- ❖ P.G Block
- ❖ Diamond Jubilee Block
- ❖ MCA Block
- ❖ Golden Jubilee Block
- ❖ New Block
- ❖ Utility block
- ❖ Alphonsa Hostel

- ❖ St Joseph Hostel
- ❖ Assisi Hostel
- ❖ Little flower Hostel
- ❖ Jeevajyothi boy's hostel
- ❖ Auditoriums
- ❖ Sports wing
- ❖ Outdoor stadium
- ❖ Canteen
- ❖ Audio Visual Hall
- ❖ IGNOU
- ❖ Kiosk
- ❖ CSM
- ❖ Language lab
- ❖ Placement Cell
- ❖ Rest rooms
- ❖ Digital Library
- ❖ Seminar halls
- ❖ Gym
- ❖ Research labs
- ❖ Computer labs
- ❖ Multipurpose synthetic courts
- ❖ Basketball court
- ❖ Football court

NIRMALA COLLEGE MUVATTUPUZHA CAMPUS LAYOUT



- | | | | |
|--|------------------------|----------------------------------|--|
| 1. Nirmala College main block | 7. Botanical Garden | 14. Handball Court | 21. Amala Bhavan – Study House |
| 2. Silver Jubilee Memorial PG block | 8. Tennis Court | 15. Salim Ali Park | 22. Nirmala Institute of Competitive Study |
| 3. Golden Jubilee Memorial Library & Research Centre | 9. Open air Auditorium | 16. Sports Hostel | 23. Jeevjayothi Gents Hostel |
| 4. Nirmala College of Pharmacy | 10. Basketball Court | 17. Football Stadium | 24. Nirmala Centre for Educational, Spiritual and Theological Training (NESTT) |
| 5. Nirmala Matha Church | 11. Utility block | 18. Assissi Bhavan– Study House | 25. Nirmala Junior Public School |
| 6. MCA Block | 12. Volleyball Court | 19. St. Joseph's Ladies' Hostel | 26. Nirmala Public & Sr. Sec. School |
| | 13. Herbal Garden | 20. Little Flower Ladies' Hostel | 27. Nirmala -Sp. B.Ed., M.Ed College |
| | | | 28. Diamond Jubilee Block |
| | | | 29. Spice Garden |

Chapter 2

Pre-Audit Stage

The green audit practically involves energy conservation, use of renewable resources, rain water harvesting, efforts of carbon sequestration methods, planting trees, waste management including hazardous and e-waste. This requires data collection and efforts for clarification of environmental policies. Green auditing includes systematic identification, recording and analysis of components related to sustainable development of an educational institution to preserve for future generations. The process has three important stages such as pre audit stage, audit stage and post audit stage.

In Nirmala college, Muvattupuzha a training programme was conducted for students and staff to help them collect data during the audit processes. Pre-audit meeting held in the college also provided an opportunity to reinforce the scope and objectives of the audit, and discussions were held on the practicalities associated with the audit. This meeting is an important prerequisite for the green audit as it is the first opportunity to meet the auditee and deal with any concerns. It was held at Nirmala College, Muvattupuzha on 29th November,

2016. The meeting was an opportunity to gather information that the audit team can study before arriving at the site. The audit protocol and audit plan was handed over at this meeting and discussed in advance of the audit itself.

In Nirmala College, Muvattupuzha pre-audit meeting was conducted successfully and necessary documents were collected directly from the college before the initiation of the audit processes. Actual planning of audit processes were discussed in the pre-audit meeting. Audit team was also selected in this meeting with the help of staff and the college management. The audit team worked together under the leadership of the lead auditor to ensure completion within the brief period and scope of the audit.

2.1 Management's Commitment

The Management of the college has shown the commitment towards the green auditing during the pre-audit meeting. They were ready to encourage all green activities. It was decided to promote all activities that are environment friendly such as awareness programs on environment, campus farming, planting more trees in the campus etc. after the green auditing. The management of the college was willing to formulate policies based on green auditing report.

2.2 Scope and Goals of Green Auditing

A clean and healthy environment aids effective learning and provides a conducive learning environment. There are various efforts around the world to address environmental education issues. Green Audit is the most efficient and ecological way to manage environmental problems. It is a kind of professional care which is the responsibility of each individual who are the part of economical, financial, social and environmental processes. It is necessary to

conduct green audit in college campus because students become aware of the green audit, its advantages to save the planet and they become good citizen of our country. Thus Green audit becomes necessary at the college level.

A very simple indigenized system has been devised to monitor the environmental performance of Nirmala College, Muvattupuzha . It comes with a series of questions to be answered on a regular basis. This innovative scheme is user friendly and totally voluntary. The aim of this is to help the institution to set environmental examples for the community, and to educate the young learners.

2 .3 Benefits of the Green Auditing

- ✓ Empower the organizations to frame a better environmental performance
- ✓ More efficient resource management
- ✓ Benchmarking for environmental protection initiatives
- ✓ To provide basis for improved sustainability
- ✓ To create a green campus
- ✓ To enable waste management through reduction of waste generation, solid- waste and water recycling
- ✓ To create plastic free campus and evolve health consciousness among the stakeholders
- ✓ Recognize the cost saving methods through waste minimizing and managing
- ✓ Point out the prevailing and forthcoming complications
- ✓ Authenticate conformity with the implemented laws
- ✓ Enhance the alertness for environmental guidelines and duties
- ✓ Impart environmental education through systematic environmental management approach and improving environmental standards

- ✓ Financial savings through a reduction in resource use
- ✓ Development of ownership, personal and social responsibility for the College and its environment
- ✓ Enhancement of college profile
- ✓ Developing an environmental ethic and value systems in youngsters.
- ✓ Green auditing should become a valuable tool in the management and monitoring of environmental and sustainable development programs of the college.

2.4 Target Areas of Green Auditing

Green audit forms part of a resource management process. Although they are individual events, the real value of green audits is the fact that they are carried out, at defined intervals, and their results can illustrate improvement or change over time. Eco-campus concept mainly focuses on the efficient use of energy and water; minimize waste generation or pollution and also economic efficiency. All these indicators are assessed in process of "Green Auditing of educational institute". Eco-campus focuses on the reduction of contribution to emissions, procure a cost effective and secure supply of energy, encourage and enhance energy use conservation, promotes personal action, reduce the institute's energy and water consumption, reduce wastes to landfill, and integrate environmental considerations into all contracts and services considered to have significant environmental impacts. Target areas included in this green auditing are water, energy, waste, green campus and carbon footprint.

➤ Auditing for Water Management

Water auditing is a method of quantifying water flows and quality in simple or complex systems, with a view to reducing water usage and often saving money on otherwise unnecessary water use. Water is life; virtually everything we do or

use each day involves water. Yet, we do not give it the importance that is due to it. India will soon be a water-stressed country and we all need to work towards our water security. There is an increasing awareness around the globe of the centrality of water to our lives. This awareness crosses political and social boundaries. In many places people have difficult access to drinking water. Often it is polluted. We need use water wisely to ensure that drinkable water is available for all, now and in the future. Water auditing is a mechanism for conserving water, which will grow in significance in the future as demand for water increases. . It is conducted for the evaluation of facilities of raw water intake and determining the facilities for water treatment and reuse. The concerned auditor investigates the relevant method that can be adopted and implemented to balance the demand and supply of water. It is therefore essential that any environmentally responsible institution examine its water use practices.

➤ **Auditing for Energy Management**

An energy audit is an inspection, survey and analysis of energy flows for energy conservation in a building, institution, process or system to reduce the amount of energy input into the system without negatively affecting the output. It shows where the power consumption is more in the given system. It can also be called as controlling of the power usage to avoid losses and maximize efficiency. Energy management (audit) approach is understanding energy costs, bench marking, energy performance, matching energy use to requirement, maximizing system efficiencies, optimizing the input energy requirements, and fuel and energy substitution. Energy cannot be seen, but we know it is there because we can sense its effects in the forms of heat, light and power. This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliances, and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment. An old incandescent bulb uses approximately 60W to 100W while

an energy efficient light emitting diode (LED) uses only less than 10 W. Energy auditing deals with the conservation and methods to reduce its consumption related to environmental degradation.

➤ **Auditing for Waste Management**

A waste audit is a methodically thought out process which can be used to determine the amount and types of waste that are generated by an organization. Information from these audits can help the organization to determine how we can reduce the amount of waste that an institution generates. In most work places, cardboard, paper, plastics, metals and food constitute the majority of what goes in the garbage. Pollution from waste is aesthetically unpleasant and results in large amount of litter in our communities which can cause health problems. Plastic bags and discarded ropes and strings can be very dangerous to birds and other animals. Solid waste can be divided into two categories: general waste and hazardous waste. General wastes include what is usually thrown away in homes and schools such as garbage, paper, tins and glass bottles. Hazardous waste is waste that is likely to be a threat to health or the environment like cleaning chemicals and petrol. Unscientific landfills may contain harmful contaminants that leach into soil and water supplies, and produce greenhouse gases contributing to global climate change. The auditor diagnoses the prevailing waste disposal policies and suggests the best way to combat the problems.

➤ **Auditing for Green Campus Management**

Green Campus is an environment which improves energy efficiency, conserving resources and enhancing environmental quality by educating for sustainability and creating healthy, living and learning environments. Green Campus rewards long term commitment to continuous environmental improvement from the campus community. Green colleges make a point to

account for sustainable living when designing and operating their buildings. Many of their facilities incorporate natural lighting, improve air quality, and reduce energy and water use. Trees play an important ecological role within the urban environment, as well as support improved public health and provide aesthetic benefits to cities. Planting trees without consideration for their species, location, and maintenance will not result in all of their wished-for benefits. It is essential to plan where the trees are planted and to plan their ongoing maintenance in order to maximize future benefits and to ensure long-term tree survival and growth. Trees in a college yard improve air quality and can reduce temperatures with their cool shade. They are a small environmental investment that will pay dividends for decades to come. In one year, a single mature tree will absorb up to 48 pounds of carbon dioxide from the atmosphere, and release it as oxygen. So while you are busy studying and working on earning those good grades, all the trees on campus are also working hard to make the air cleaner for us. Trees on our campus impact our mental health as well; studies have shown that trees greatly reduce stress, which a huge deal is considering that many students are under some amount of stress.

➤ **Auditing for Carbon Footprint**

Microcosms of the world at large, college campuses are great test beds for environmental change, and many students are working hard to get their administrations to take positive action. The initiatives that are emerging are models for the larger society, and the students pushing for them will be taking these lessons with them, too, as they enter the work force after graduation. Foremost on the minds of green-leaning students today is global warming, and many are joining hands to persuade their colleges to update policies and streamline operations so that their campuses can become part of the solution. Commutation of stakeholders has an impact on the environment through the emission of greenhouse gases into the atmosphere consequent to burning of

fossil fuels (such as petrol). The most common greenhouse gases are carbon dioxide, water vapour, methane, nitrous oxide and ozone. Of all the greenhouse gases, carbon dioxide is the most prominent greenhouse gas, comprising 402 ppm of the Earth's atmosphere. The release of carbon dioxide gas into the Earth's atmosphere through human activities is commonly known as carbon emissions. The question is what should be done to reduce carbon emissions. Often the challenge lies in choosing just the right approach that will contribute most to the objective. Naturally, the results of these interventions also have to be monitored and assessed.

Many colleges want to reduce their carbon dioxide (CO₂) emissions. But that's not so easy, given that a range of factors determine carbon emissions, including mobility, waste, and energy consumption. So, gaining insight into CO₂ emissions is extremely important.

An important aspect of doing an audit is to be able to measure your impact so that we can determine better ways to manage the impact. In addition to the water, waste, energy and biodiversity audits we can also determine what our carbon footprint is, based on the amount of carbon emissions created. One aspect is to consider the distance and method traveled between home and college every day. It undertakes the measure of bulk of carbon dioxide equivalents exhaled by the organization through which the carbon accounting is done. It is necessary to know how much the organization is contributing towards sustainable development.

2.5 Methodology of Green Auditing

The purpose of the audit was to ensure that the practices followed in the campus are in accordance with the Green Policy adopted by the institution. The criteria, methods and recommendations used in the audit were based on the identified risks. The methodology includes: preparation and filling up of

questionnaire, physical inspection of the campus, observation and review of the documents, interviewing responsible persons and data analysis, measurements and recommendations. The methodology adopted for this audit was a three step process comprising of:

1. Data Collection – In data collection phase, exhaustive data collection was performed using different tools such as observation, survey communicating with responsible persons and measurements. Data collection was done from the primary sources.

Following steps were taken for data collection:

- The team visited each department, centres, Library, canteen, gardens, campus etc.
- Data on the general information was collected by observation and interview.
- The power consumption of appliances was recorded by taking an average value in some cases.
- Plants were identified using standard taxonomic books.
- Waste generated was measured directly at the source of production.

2. Data Analysis - Detailed analysis of data collected include: computation of energy consumption, analysis of latest electricity bill of the campus, understanding the tariff plan provided by the Kerala State Electricity Board (KSEB). Data related to water usage were also analyzed using appropriate methodology.

3. Recommendation – On the basis of results of data analysis and observations, some steps for reducing power and water consumption were recommended. Proper treatment methods for waste were also suggested. The above target areas particular to the college was evaluated through questionnaire circulated among the students for data collection.

Five categories of questionnaires were distributed. The formats of these are given below.

2.6 Survey Forms

I

Green Auditing Nirmala College, Muvattupuzha Auditing for Water Management

1. List uses of water in your college.
2. What are the sources of water in your college?
3. How many wells are there in your college?
4. No. of motors used for pumping water from each well?
5. What is the total horse power of each motor?
6. What is the depth of each well?
7. What is the present depth of water in each well?
8. How does your college store water?
9. Quantity of water stored in your overhead water tank? (in liters)
10. Quantity of water pumped every day? (in liters)
11. If there is water wastage, specify why.
12. How can the wastage be prevented / stopped?
13. Locate the point of entry of water and point of exit of waste water in your College.
14. Where does waste water come from?
15. Where does the waste water go?
16. What are the uses of waste water in your college?
17. What happens to the water used in your labs? Whether it gets mixed with ground water?
18. Is there any treatment for the lab water?
19. Whether green chemistry methods are practiced in your labs?
20. Write down four ways that could reduce the amount of water used in your college.
21. Record water use from the college water meter for six months.
22. Bimonthly water charges paid to water connections if any
23. No. of water coolers. Amount of water used per day? (in liters)
24. No. of water taps. Amount of water used per day?
25. No. of bath rooms in staff rooms, common, hostels.
amount of water used per day?
26. No. of toilet, urinals. Amount of water used per day?
27. No. of water taps in the canteen. Amount of water used per day?
28. Amount of water used per day for garden use.
29. No. of water taps in laboratories. Amount of water used per day in each lab?

- 30 Total use of water in each hostel?
- 31 At the end of the period, compile a table to show how many litres of water have been used in the college for each purpose
- 32 Is there any water used for agricultural purposes?
- 33 Does your college harvest rain water?
- 34 If yes, how many rain water harvesting units are there?
- 35 How many of the taps are leaky? Amount of water lost per day?
- 36 Are there signs reminding people to turn off the water? Yes / No
- 37 Is there any waterless toilets? _____
- 38 How many water fountains are there? _____
- 39 How many water fountains are leaky? _____
- 40 Is drip irrigation used to water plants outside? YES/NO
- 41 How often is the garden watered?
- 42 Quantity of water used to watering the ground?
- 43 Quantity of water used for bus cleaning? (liters per day)
- 44 Amount of water for other uses? (items not mentioned above)
- 45 Area of the college land without tree/building canopy.
- 46 Is there any water management plan in the college?
- 47 Are there any water saving techniques followed in your college?
What are they?
- 48 Please share Some IDEA for how your college could save more water.

II

**Green Auditing @ Nirmala College, Muvattupuzha
Auditing for Energy Management**

1. List ways that you use energy in your college. (Electricity, electric stove, kettle, microwave, LPG, firewood, Petrol, diesel and others).
2. Electricity bill amount for the last year
3. Amount paid for LPG cylinders for last one year
4. Weight of firewood used per month and amount of money spent? Also mention the amount spent for petrol/diesel/ others for generators?
5. Are there any energy saving methods employed in your college? If yes, please specify. If no, suggest some.
6. How much money does your college spend on energy such as electricity, gas, firewood, etc. in a month. (Record monthly for the year 2016).
7. How many CFL bulbs has your college installed? Mention use (Hours used/day for how many days in a month)
8. Energy used by each bulb per month? (for example- 60 watt bulb x 4hours x number of bulbs = kwh).
9. How many LED bulbs are used in your college? Mention the use (Hours used/day for how many days in a month)
10. Energy used by each bulb per month? (kwh).

11. How many incandescent (tungsten) bulbs have your college installed? Mention use (Hours used/day for how many days in a month)
12. Energy used by each bulb per month? (kwh).
13. How many fans are installed in your college? Mention use (Hours used/day for how many days in a month)
14. Energy used by each fan per month? (kwh)
15. How many air conditioners are installed in your college? Mention use (Hours used/day, for how many days in a month)
16. Energy used by each air conditioner per month? (kwh).
17. How many electrical equipments including weighing balance are installed your college? Mention the use (Hours used/day for how many days in a month)
18. Energy used by each electrical equipment per month? (kwh).
19. How many computers are there in your college? Mention the use (Hours used/day for how many days in a month)
20. Energy used by each computer per month? (kwh)
21. How many photocopiers are installed by your college? Mention use (Hours used/day for how many days in a month).
22. How many cooling apparatus are in installed in your college? Mention use (Hours used/day for how many days in a month)
23. Energy used by each cooling apparatus per month? (kwh) Mention use (Hours used/day for how many days in a month)
24. Energy used by each photocopier per month? (kwh) Mention the use (Hours used/day for how many days in a month) how many inverters your college installed? Mention use (Hours used/day for how many days in a month)
25. Energy used by each inverter per month? (kwh)
26. How many electrical equipment are used in different labs of your college? Mention the use (Hours used/day for how many days in a month)
27. Energy used by each equipment per month? (kwh)
28. How many heaters are used in the canteen of your college? Mention the use (Hours used/day for how many days in a month)
29. Energy used by each heater per month? (kwh)
30. No of street lights in your college?
31. Energy used by each street light per month? (kwh)
32. No of TV in your college and hostels?
33. Energy used by each TV per month? (kwh)
34. Any other item that uses energy (Please write the energy used per month) Mention the use (Hours used/day for how many days in a month)
35. Are any alternative energy sources/nonconventional energy sources employed / installed in your college? (photovoltaic cells for solar energy, windmill, energy efficient stoves, etc.,) Specify.
36. Do you run "switch off" drills at college?
37. Are your computers and other equipment put on power-saving mode?

38. Does your machinery (TV, AC, Computer, weighing balance, printers, etc.) run on standby mode most of the time? If yes, how many hours?
39. What are the energy conservation methods adapted by your college?
40. How many boards displayed for saving energy awareness?
41. How much ash is collected after burning fire wood per day in the canteen?
42. Write a note on the methods/practices/adaptations by which you can reduce the energy use in your college campus in future.

Calculation of energy for electrical appliances

Appliance	Power	Usage per	Number of	Average	Average
Incandescent	60 watt				
CFL	18 W				
Microwave	1000W				
Stove	3000W				
Kettle	2500W				

III

**Green Auditing @ Nirmala College, Muvattupuzha
Auditing for Waste Management**

- What is the total strength of students, teachers and Non teaching staff in your College?

No. of Students	No. of Teachers	No. Non teaching staff
Gents		
Ladies		
Total		

Which of the following are available in your College? Give area occupied and number

Garden area	Garbage dump (number)
Play ground area	Laboratory
Kitchen	Canteen
Toilets (number)	Car/scooter shed area
Number of class rooms	Office rooms
	Others (specify)

- Which of the following are found near your college?
Mark the level of disturbance it creates for the college in a scale of 1 to 9.
Municipal dump yard, Garbage heap, Public convenience, Sewer line,
Stagnant water, Open drainage, Industry – (Mention the type)
Bus / Railway station, Market / Shopping complex / Public halls

WASTE

Does your college generate any waste?
If so, what are they? How much quantity? Number or weight
E-waste, Hazardous waste (toxic), Solid waste, Dry leaves, Canteen waste,

Nirmala College, Muvattupuzha

Liquid waste, Glass, Unused equipment, Medical waste if any, Napkins, Others (Specify)

- Is there any waste treatment system in the college?
- Is there any treatment for toilet/urinal/sanitary napkin waste?

1 What is the approximate quantity of waste generated per day? (in Kilograms)

Office

Approx	Bio degradable	Non-Bio degradable	Hazardous	Others
< 1 kg.				
2 - 10 kg.				
> 10 kg.				

Laboratories

Approx	Bio degradable	Non-Bio degradable	Hazardous	Others
< 1 kg.				
2 - 10 kg.				
> 10 kg.				

Canteen/kitchen

Approx	Bio degradable	Non-Bio degradable	Hazardous	Others
< 1 kg.				
2 - 10 kg.				
> 10 kg.				

- 2 Why waste is a problem?
- 3 Whether waste is polluting ground/surface water? How?
- 4 Whether waste is polluting the air of the college? How?
- 5 How is the waste generated in the college managed? Methods
 1 Composting, 2. Recycling, 3. Reusing, 4. Others (specify)
- 6 How many separate boxes do you think you would need to put into a classroom to start a waste segregation and recycling campaign?
 What should be the use for each box? (Develop a colour code with reasons)
- 7 Do you use recycled paper in College?
- 8 Is there any waste wealth program practiced in the college?
- 9 How would you spread the message of recycling to others in the community? Have you taken any initiatives? If yes, please specify.
- 10 Can you achieve zero garbage in your college? (Reduce ,Recycle, Reuse, Refuse) If yes, how?

IV

**Green Auditing @ Nirmala College, Muvattupuzha
Auditing For Green Campus Management**

1. Is there a garden in your college? Area?
2. Do students spend time in the garden?
3. List the plants in the garden, with approx. numbers of each species.
4. Suggest plants for your campus. (Trees, vegetables, herbs, etc.)
5. List the species planted by the students, with numbers.
6. Whether you have displayed scientific names of the trees in the campus?
7. Is there any plantations in your campus? If yes specify area and type of plantation.
8. Is there any vegetable garden in your college? If yes how much area?
9. Is there any medicinal garden in your college? If yes how much area?
10. What are the vegetables cultivated in your vegetable garden?
(Mention the quantity of harvest in each season)
11. How much water is used in the vegetable garden and other gardens?
(Mention the source and quantity of water used).
12. Who is in charge of gardens in your college?
13. Are you using any type of recycled water in your garden?
14. List the name and quantity of pesticides and fertilizers used in your gardens?
15. Whether you are doing organic farming in your college? How?
16. Do you have any composting pit in your college? If yes What are you doing with the compost generated?
17. What do you doing with the vegetables harvested? Do you have any student market?
18. Is there any botanical garden in your campus? If yes give the details of campus flora.
19. Give the number and names of the medicinal plants in your college campus.
20. Any threatened plant species planted/conserved?
21. Is there a nature club in your college? If yes what are their activities?
22. Is there any arboretum in your college? If yes details of the trees planted.
23. Is there any fruit yielding plants in your college? If yes details of the trees planted.
24. Is there any groves in your college? If yes details of the trees planted.
25. Is there any irrigation system in your college?
26. What is the type of vegetation in the surrounding area of the college?
27. What are the nature awareness programmes conducted in the campus?(2016-17)
28. What is the involvement of students in the green cover maintenance?
29. What is the total area of the campus under tree cover?under tree canopy?
30. Share your IDEAS for further improvement of green cover.

V

**Green Auditing @ Nirmala College, Muvattupuzha
Auditing for Carbon Footprint**

1. What is the total strength of students and teachers in your College?
No. of Students No. of Teachers No. of Non teaching staff
Gents
Ladies
Total
2. Total Number of vehicles used by the stakeholders of the college. (per day)
3. No. of cycles used
4. No. of two wheelers used (average distance travelled and quantity of fuel and amount used per day)
5. No. of cars used (average distance travelled and quantity of fuel and amount used per day)
6. No. persons using common (public) transportation (average distance travelled and quantity of fuel and amount used per day)
7. No. of persons using college conveyance by the students, non teaching staff and teachers (average distance travelled and quantity of fuel and amount used per day)
8. Number of parent-teacher meetings in an year? Parents turned up (approx.)
9. Number of visitors with vehicles per day?
10. Number of generators used per day (hours). Give the amount of fuel used per day.
11. Number of LPG cylinders used in the canteen (Give the amount of fuel used per day and amount spent).
12. Quantity of kerosene used in the canteen/labs (Give the amount of fuel used per day and amount spent).
13. Amount of taxi/auto charges paid and the amount of fuel used per month for the transportation of vegetables and other materials to canteen.
14. Amount of taxi/auto charges paid per month for the transportation of office goods to the college.
15. Average amount of taxi/auto charges paid per month by the stakeholders of the college.
16. Use of any other fossil fuels in the college (Give the amount of fuel used per day and amount spent).
17. Suggest the methods to reduce the quantity of use of fuel used by the stakeholders/students/teachers/non teaching staff of the college.

Chapter 3

Audit Stage

In Nirmala College, Muvattupuzha green auditing was done with the help of CMJ eco-associates involving different student groups and staff. A training programme was organized to orient the staff and students to collect the data for green auditing. The green audit began with the teams walking around examining all the different facilities of the college, identifying the different types of appliances and utilities (lights, taps, toilets, fridges, etc.), as well as measuring the usage per item (Watts indicated on the appliance or measuring water from a tap) and identifying the relevant consumption patterns (such as how often an appliance is used) and their impacts. The staff and learners were interviewed to get details of usage, frequency or general characteristics of certain appliances. Data collection was done in the sectors such as Energy, Waste, Greening, Carbon footprint and Water use. College records and documents were verified several times to clarify the data received through survey and discussions. The whole process was completed within five months from 2016 November to March, 2017.

3.1 Students and Staff Involved in Green Auditing

General Co-Ordinator

Dr. T. M Joseph, Principal

Main Conveners: -_Fr. Francis Kannadan, Dr. Johny Scaria,
Dr T. M . Jacob

1. Water Management

Faculty In Charge : Biju Peter, Mathews K. Manayani

Students		
SI No	Name	Department
1	Sachin Sebastian	Chemistry
2	Denson Dominic	Chemistry
3	Nalin Kumar CV	Chemistry
4	Thomaskutty MV	Chemistry
5	Jithin P	Chemistry
6	Roshny Roy	Chemistry
7	Minu Mary Francis	Chemistry
8	Kavitha J	Chemistry
9	Delna Elizabeth	Chemistry
10	Aniet Tomy	Chemistry
11	Nimmy Aliyas	Chemistry
12	Sijna Moideen	Chemistry
13	Aswathy Nair	Chemistry
14	Alisha Ann Mary	Chemistry
15	Nalina Roy	Chemistry
16	Athira MS	Chemistry
17	AshnaChacko	Chemistry
18	Jacob Sunny	Chemistry

2. Green Campus Management

Faculty In Charge: Dr. Sr. Tessy Joseph, Ms. Jaiby Cyriac, Ms. Reshmy T.R, Ms. Jisha George

Students		
SI No	Name	Department
1	Akash Shine Thomas	Botany
2	AnjanaSubash	Botany
3	Juby Baby	Botany
4	Kousalya C.	Botany
5	Aparna Saji	Botany
6	Sreeya Sajan	Botany
7	Syalini Sivan	Botany
8	Thushara Ramakrishnan	Botany
9	Mathew Thomas	Botany
10	Mohamed Fayiz	Botany
11	Sreejith George	Botany
12	Vignesh P.B.	Botany
13	AnjanaSen	Botany

Nirmala College, Muvattupuzha

14	Aleena Joy	Botany
15	Aneesha Subair	Botany
16	Aswathy Appukuttan	Botany
17	Fathima Muhammed	Botany
18	Ashna Sunny	Botany
19	Doonia Johnson	Botany
20	Hilda Jose	Botany

3. Carbon Footprint

Faculty In Charge: - Ambily Elizabeth (Dept of Zoology)
Titu Thomas (Dept of Physics)

Students

SI No	Name	Department
1	Oormila Antony	Zoology
2	Rosemary Joseph	Zoology
3	Leema Rose Mathew	Zoology
4	Agnes T Sebastian	Zoology
5	Aruna Mathew	Zoology
6	Baby krishna P K	Zoology
7	Anjana K Ajayan	Zoology
8	Merin Francis	Zoology
9	Greeshma Shaji	Zoology
10	Abhirami C Nair	Zoology
11	Nidhin P Ravi	Physics
12	Amalraj K	Physics
13	Mahesh M	Physics
14	Sidharth Manmadhan	Physics
15	Anusree S Nair	Physics
16	Kiran J Danny	Physics
17	Akhil K K	Physics
18	Sravan N Suresh	Physics
19	Sabreen S Basheer	Physics
20	Aparna Raj C	Physics
21	Annmary N S	Physics
22	Karthika Murali	Physics
23	Dona Tomy	Physics
24	Alanda Prince	Physics
25	Aleena Benny	Physics
26	Nidhin P Ravi	Physics

4. Waste Management

Faculty In Charge: Dr. Nibu Thomson, Ms. Seema Joseph
Mr. Shaimon Joseph

Students

SI No	Name	Department
1	Basilmon M Baby	Mathematics
2	Chikku Ramanan	Mathematics

Nirmala College, Muvattupuzha

3	DeepaShaji	Mathematics
4	Rose MaryJaic	Mathematics
5	Abhijith Ravi	Mathematics
6	AnjoJenus	Mathematics
7	Sarath A S	Mathematics
8	Carolin Therese	Mathematics
9	Sreelakshmi K S	Zoology
10	Nibin Sumedha	Zoology
11	MariyaSaju	Zoology
12	Aparna Suresh	Economics
13	Alby Thomas	Economics
14	Santhya G	Bcom
15	Akhila Joseph	BA English
16	Amrutha C S	BA Hindi
17	Aparna Ashok	BA Malayalam
18	Gokul Prasad	Bcom Tax
19	Anantha krishnan	Bcom Tax
20	Ayoob C A	Physics
21	Georgin Sabu	Physics Vocational
22	Sandeep T A	BCA

5. Energy Management

Faculty In Charge: Dr.George James T, Philip Augustine, Dr.Shibin Mohan N, Dr.vinod K.V, Dr.Neerada Maria Kurian,Jasmine Mary P.J, Aby Thomas, Jobin Jose, Arun Geo Augustine

Students

SI No	Name	Department
1	Jerin Thankachan	BSc Physics Model I
2	Nevin Abraham	BSc Physics Model I
3	Aiswarya Nair	BSc Physics Model I
4	Aleena Dominic	BSc Physics Model I
5	Aleena Jose	BSc Physics Model I
6	Ambili George	BSc Physics Model I
7	Anjaly P S	BSc Physics Model I
8	Aparna Baby	BSc Physics Model I
9	Aveena Abee	BSc Physics Model I
10	Ayana Ayyappan	BSc Physics Model I
11	Jijitha Rajan	BSc Physics Model I
12	Sandhra Sebastian	BSc Physics Model I
13	Thulasi Kv	BSc Physics Model I
14	Ajmal Anwar	BSc Physics Model I
15	Akhil Jose	BSc Physics Model I
16	Akhil P S	BSc Physics Model I
17	Anandu Chandran	BSc Physics Model I
18	Emmanuel K	BSc Physics Model I
19	Jerin M Joy	BSc Physics Model I

20	Shibin Thomas	BSc Physics Model I
21	Stephan Jose	BSc Physics Model I
22	Tijin Kurian	BSc Physics Model I
23	Aiswarya V	BSc Physics Model I
24	Anaswara Sabu	BSc Physics Model I
25	Anjaly Sunny	BSc Physics Model I
26	Anjaly Vijayan	BSc Physics Model I
27	Chithra Aloysius	BSc Physics Model I
28	Lorain Thomas	BSc Physics Model I
29	Sebin John	BSc Physics Model I

3.2 Student Clubs and Forums Involved

Nature Club, Tourism Club, Women's Cell, Career Guidance and Placement Cell, Film and Dramatic club, Oratory club Mentoring Cell, Music Club, Folklore club, ED Club, Varnasala, Encon Club, N.S.S, N.C.C, Quiz club, CSM and Department level Associations.

3.3 Comments on Site Tour

Site inspection was done along with students and staff. Audit team visited laboratories, libraries, class rooms, botanical garden, college campus, agricultural fields, medicinal plant garden, spices garden, solar power generation fields, play grounds etc. Questionnaires were answered during the site tour. Students and staff took much interest in the data collection process. It was an environmental awareness program for the students who participated in the green auditing. It was quite interesting and fascinating. The experience of green auditing was totally a new experience for most of the students. They have shared their expectations about a green campus and gave suggestions for the audit recommendations. Data collected in different intervals were consolidated later.

3.4 Review of Documents and Records

Data verification was done with office records. Documents such as admission registers, registers of electricity and water charge remittance, furniture register, laboratory equipment registers, purchase register, and audited statements of the college were examined for data collection and verifications. College

calendars, college magazines, annual report of the college and NAAC self-assessment reports, UGC report etc. were also verified as part of data collection.

3.4 Review of Policies

Discussions were made with the college management regarding their policies on environmental management. Reviews of existing policies were also done. Future plans of the college and basis for new policies to be adopted were also discussed. The management would formulate a revised environment /green policy for the college in the light of green auditing. The purpose of the green audit was to ensure that the practices followed in the campus are to be in accordance with the green Policy adopted by the institution.

3.5 Interviews

In order to collect information for green auditing different audit groups interviewed office staff, Principal, teaching and non-teaching staff, students, parents and other stakeholders of the college. Discussions were also held with the PTA office bearers to clarify doubts regarding certain aspects.

3.6 Site inspection

College and its premises were visited and analyzed by the audit-teams several times to gather information. Campus trees were counted and identified. Vegetable garden, banana garden, play grounds, canteen, library, office rooms and parking grounds were also visited to collect data. Number and type of vehicles used by the stakeholders were counted and fuel consumption for each vehicle was verified with the user. Number of LPG cylinders used in labs, canteen and hostel kitchen were also counted. Leakage of a few water taps were noticed during the site inspection. Energy wastage and misuses were also noted.

Chapter 4

Post Audit Stage

The base of any green audit is that its findings are supported by documents and verifiable information. The audit process seeks, on a sampled basis, to track past actions, activities, events, and procedures to ensure that they are carried out according to systems requirements and in the correct manner. Although green audits are carried out using policies, procedures, documented systems and objectives as a test, there is always an element of subjectivity in an audit. The essence of any green audit is to find out how well the environmental organisation, environmental management and environmental equipment are performing. Each of the three components is crucial in ensuring that the organisation's environmental performance meets the goals set in its green policy.

4.1 Key Findings and Observations

a) Water

- ❖ Main water uses in the campus
 - Drinking purpose.
 - Toilets and Wash areas (including hostel and canteen).
 - Labs.
 - Gardening and agriculture.

- Construction purpose.
- Cooking purpose in hostels and canteen.
- ❖ No water treatment system in place.
- ❖ Water cooler with drinking water filtration is installed (9 numbers).
- ❖ Number of urinals and toilets – 194
- ❖ Number of waterless urinals - Nil
- ❖ Number of bathrooms – 21
- ❖ Number of water taps – 659 (21 taps are leaky)
- ❖ Water taps in laboratories - 59
- ❖ Number of wells – 1 tube well and 5 open wells
- ❖ Number of ponds - 1
- ❖ Water pumps – 5 (7.5 hp x 2, 10 hp, 5 hp x 2)
- ❖ Depth of each well

Little flower hostel	-	28ft
Main pond near L.F hostel	-	18.5 ft
Small pond near L.F hostel	-	8.5 ft
Jeevajyothi hostel (2-ponds)	-	9 ft (each)
- ❖ Quantity of water pumped – 95000 liters/day
- ❖ Total water in the overhead tanks – 151364 L
- ❖ Water charges paid – No water charges(No municipal water supply, Using water from own well)
- ❖ Number of water tanks for water storage -20

Capacity of overhead water tanks

• Main block Water tank	-	32906 L
• PG block water tank	-	6480 L
• In front of main office (2)	-	6000 L
• On the top of the golden jubilee block (2 tanks)	-	6000 L
• In front of sports hostel	-	1000 L
• Little flower hostel	-	18700 L
• Little flower hostel (2 synthetic tanks)	-	10000 L
• In front of canteen	-	6440 L
• MCA block (3 tanks)		6000 L
• Diamond jubilee Block(2 tanks)-		41838 L
• Jeevajyothi Hostel(2 tanks)	-	16000 L
Total overhead water tank capacity		151364 L

Reasons for water wastage

- Leakages from taps
- Over use of water
- Overflow of water from overhead tanks

Overall utilization of water in the College

Sections	Water Use/day
Toilets and urinals	19400 Ltr
Hostel	33300 Ltr
Bathrooms	11000 Ltr
Canteen	5,000 Ltr
Garden	5000 Ltr
Laboratories	12,300 Ltr
Drinking	1000 Ltr
Leakage	727 Ltr
Construction work	5000 Ltr
Total	92727 Ltr

Suggestions of the college to save water

- Rain water harvesting systems should be implemented.
- Posters could be placed at the wash areas as well as toilets to make the students aware about the value of water resources.
- The water over flowing from the tank should be collected and reused for gardening or any other purposes.
- Automated sensors can be installed in order to prevent the over flow of water from tanks.
- Awareness campaigns can be held in the campus for the students to save water.
- Automated taps could be used so that usage of water can be reduced.
- Awareness campaigns can be conducted among students.
- Periodical maintenance of water taps should be done in order to prevent the leakage of water through taps.

b) Energy

- ❖ Electricity charges Rs.100000/month
- ❖ Number of Gas cylinders used per month – 60
- ❖ Cost of Gas cylinders used Rs. 39000/month
- ❖ Weight of firewood used – 1210 Kg/month
- ❖ Cost of firewood - 9600/month (1210 kg)
- ❖ Number of Generators – 5 (12-15 L Diesel/day)
- ❖ Power generated by the Generator - 3852
- ❖ Cost of generator fuel – Rs.750/day
- ❖ Total cost of energy – Rs. 171100/month
- ❖ Total number of CFL bulbs – 432
- ❖ Number of LED lights – 118
- ❖ Incandescent bulbs – 39
- ❖ Number of fans – 814
- ❖ Number of Air conditioners - 25
- ❖ Number of Tube lights – 656
- ❖ Total Electrical Equipments – 217
- ❖ Number of Computers and laptops – 347
- ❖ Number of Photocopiers – 6
- ❖ Number of inverters – 60
- ❖ Number of heaters used – 30
- ❖ Number of water pumps – 5
- ❖ Power used – 2941 kWh
- ❖ Number of Televisions – 21
- ❖ Total electric power used – **17856.97**kWh/month
- ❖ Energy generation by solar panels – 25 KV Solar cells- 3000 kWh/month

POWER SOURCE		Total Power Consumption	
SOLAR	3000	Inverter	591.63
KSEB	11000	Eelctrical Equipments	14324.34
GENERATOR	3952	Water Pump	2941.00
Total	17952		17856.97

Energy usage in the college

ENERGY USAGE OF CFL BULBS IN THE COLLEGE

Department/Room	APPLIANCES (A)	POWER IN WATT(B)	NO OF APPLIANCES (C)	Average Usage/day (D)	ENERGY USAGE/MONTH(kwh)
MCA	CFL	15	36	3.33	53.946
MCA (AUDITORIUM/SEMINAR HALL)	CFL	15	26	1.26	14.742
MAIN AUDITORIUM/SEMINAR/AUDIO VISION HALL/	CFL	15	49	0.66	14.553
COMPUTER LAB	CFL	15	25	1.26	14.175
PRINCIPAL OFFICE	CFL	15	5	3.33	7.4925
VIP/SUIT ROOM	CFL	15	3	0.66	0.891
WAITING ROOM	CFL	15	1	3.33	1.4985
CHEMISTRY	CFL	15	3	3.33	4.4955
CAMPUS	CFL	15	19	3.33	28.4715
IGNOU	CFL	15	1	2.12	0.954
PLACEMENT CELL	CFL	15	1	3.33	1.4985
DINING AREA	CFL	20	2	1.26	1.512
WASH ROOM	CFL	15	4	3.33	5.994
BCA	CFL	15	1	3.33	1.4985
STATISTICS	CFL	15	3	3.33	4.4955
HINDI	CFL	15	1	3.33	1.4985
CHAPPEL /YOGA CENTRE	CFL	20	2	0.66	0.792
COMMERCE	CFL	15	13	2.16	12.636
BOTANY	CFL	15	1	3.33	1.4985
LIBRARY/ PHOTOSTAT	CFL	15	22	3.33	32.967
CANTEEN	CFL	20	1	3.33	1.998
GYM	CFL	15	1	3.12	1.404
LADIES HOSTEL	CFL	15	68	3.12	95.472
BOYS HOSTEL	CFL	15	128	3.33	191.808
MAIN AUDITORIUM	CFL	100	4	2.26	27.12
CONFERENCE HALL	CFL	20	12	2.16	15.552
TOTAL ENERGY USAGE IN MONTH(kWh)					538.9635

ENERGY USAGE OF LED BULBS IN COLLEGE

Department/Room	APPLIANCES (A)	POWER IN WATT(B)	NO OF APPLIANCES (C)	Average Usage / day (D)	ENERGY USAGE /MONTH(kwh)
AUDITORIUM (DJ BLOCK)	LED	9	46	0.33	4.0986
CANTEEN	LED	9	2	1.26	0.6804
COMMERCE(SF)	LED	9	1	1.26	0.3402
GYM	LED	9	3	0.66	0.5346

Nirmala College, Muvattupuzha

LADIES HOSTEL	LED	9	36	1.16	11.275
LADIES HOSTEL	LED	15	3	1.26	1.701
MAIN AUDITORIUM	LED	50	1	0.16	0.24
MCA BLOCK	LED	9	4	2.26	2.4408
MHRM	LED	9	2	2.26	1.2204
TOURISM	LED	9	6	2.6	4.212
CAMPUS	LED	9	14	2.26	8.5428
TOTAL ENERGY USAGE IN MONTH(kWh)					35.286

ENERGY USAGE OF INCANDESCENT BULBS IN COLLEGE

Department/Room	APPLIANCE (A)	POWER	NO OF	Avera	ENERG
AUDIO VISION HALL	INCADESCENT BULB	40	1	0.66	0.792
BCA	INCADESCENT BULB	40	1	1.26	1.512
CAMPUS	INCADESCENT BULB	40	3	2.16	7.776
COMM.ENG	INCADESCENT BULB	40	2	3.33	7.992
COMMERCE	INCADESCENT BULB	40	1	3.33	3.996
COMMERCE(SF)	INCADESCENT BULB	40	1	3.33	3.996
GIRLS TOILET	INCADESCENT BULB	40	2	3.33	7.992
GYM	INCADESCENT BULB	40	1	1.26	1.512
HINDI	INCADESCENT BULB	40	2	3.33	7.992
LADIES HOSTEL	INCADESCENT BULB	40	1	2.26	2.712
LIBRARY GROUND FLOOR	INCADESCENT BULB	40	1	2.16	2.592
MAIN AUDITORIUM	INCADESCENT BULB	40	2	0.33	0.792
MALAYALAM	INCADESCENT BULB	40	1	2.26	2.712
REST ROOM AND WASH	INCADESCENT BULB	40	5	2.26	13.56
WASHROOM (BOYS)	INCADESCENT BULB	40	5	2.36	14.16
BCA	ZERO BULB	10	1	1.66	0.498
AUDITORIUM (DJ BLOCK)	HALOGEN BULB	750	2	0.12	5.4
PHYSICS	TABLE LAMP	25	5	2.66	9.975
BASKET BALL COURT	HALOGEN BULB	750	2	0.12	5.4
TOTAL ENERGY USAGE IN MONTH(kWh)					101.36

ENERGY USAGE OF FANS IN COLLEGE

Department/Room	APPLIANCES (A)	POWER IN WATT(B)	NO OF APPLIANCE S (C)	Avera ge Usage / day (D)	ENERG Y USAGE /MONT H(kwh)
AUDIO VISION HALL	WALL FAN	55	13	0.66	14.157
AUDITORIUM (DJ BLOCK)	FAN	55	35	0.33	19.057
BCA	FAN	55	13	1.26	27.027
BOTANY	FAN	55	18	1.26	37.422
CANTEEN	FAN	55	13	0.66	14.157
CHAPPEL	FAN	55	6	0.13	1.287
CHEMISTRY	FAN (EXHAUST)	160	4	2.26	43.392
	FAN/TABLE FAN	53	17	1.56	42.166
COMM ENGLISH SF	FAN	55	15	2.26	55.935

Nirmala College, Muvattupuzha

COMMERCE	FAN	55	21	2.19	75.883
COMMERCE(SF)	FAN /	55	46	1.33	100.94
COMPUTER LAB	FAN	55	20	1.33	43.89
	FAN (EXHAUST)	140	5	1.29	27.09
CONFERENCE HALL	FAN	55	3	0.16	0.792
DIGITAL LIBRARY	FAN	55	8	1.12	14.784
DINING AREA	FAN	55	2	0.66	2.178
ECONOMICS	FAN/TABLE FAN	55	16	1.26	33.264
ENGLISH	FAN	55	8	1.26	16.632
FOLKLORE MUSEUM	FAN	55	1	0.16	0.264
GYM	FAN	55	1	0.66	1.089
HINDI	FAN	55	11	1.26	22.869
HOSTEL (BOYS)	FAN	55	110	2.12	384.78
HOSTEL (LADIES)	FAN	55	109	2.12	381.28
IGNOU	FAN	55	1	2.16	3.564
IQAC	FAN	55	1	0.99	1.6335
KIOSK	TABLE FAN	55	1	1.26	2.079
LADIES HOSTEL	TABLE FAN	55	1	1.25	2.0625
LIBRARY	FAN	55	30	2.26	111.87
MAIN AUDITORIUM	WALL FAN	55	23	0.33	12.523
MALAYALAM	FAN	55	14	1.24	28.644
MANAGER	FAN	55	2	1.24	4.092
MATHEMATICS	FAN	55	12	1.16	22.968
MCA	FAN	55	67	2.22	245.42
MCA (AUDITORIUM)	FAN	55	12	0.33	6.534
MCA (SEMINAR HALL)	FAN	55	4	0.33	2.178
MHRM	FAN	55	7	3.33	38.461
PHYSICS	FAN	55	36	3.33	197.80
PLACEMENT CELL	FAN	55	2	3.33	10.989
PRINCIPAL/VICE	FAN	55	11	7.2	130.68
PUNNAKOTTIL HALL	FAN	55	6	0.3	2.97
SEMINAR HALL	FAN	55	21	2	69.3
STATISTICS	FAN	55	9	3.33	49.450
STORE AND EXAM ROOM	FAN	55	2	0.66	2.178
TOURISM MANAGEMENT	FAN	55	28	3.33	153.84
VIP/GUEST ROOM	FAN	55	4	0.16	1.056
WASH ROOM (BOYS)	FAN (EXHAUST)	160	2	3.33	31.968
WASH ROOM (GIRLS)	FAN	55	4	3.33	21.978
ZOOLOGY	FAN	55	19	3.33	104.39
	TOTAL ENERGY USAGE IN MONTH(kWh)				2618.9
ENERGY USAGE OF AIR CONDITIONERS IN COLLEGE					
Department/Room	APPLIANCES (A)	POWER	NO OF	Avera	ENERG
AUDIO VISION HALL	A/C (CENTRALISED)	10000	1	2	600
BCA	AC	1000	5	2.26	339
COMMERCE	AC	1000	3	0	0

Nirmala College, Muvattupuzha

CONFERENCE HALL	A/C (CENTRALISED)	3000	1	0.16	14.4
MCA OFFICE	AC	1000	3	2.26	203.4
MCA PARLOUR	AC	1000	2	0.16	9.6
HOSTEL (BOYS) OFFICE	AC	1000	1	1	30
COMPUTER LAB	A/C (CENTRALISED)	1000	2	0.99	59.4
MCA (AUDITORIUM)	A/C (CENTRALISED)	6000	2	0.33	118.8
MCA (SEMINAR HALL)	A/C (CENTRALISED)	2000	1	0.33	19.8
SEMINAR HALL	AC	1000	4	0.16	19.2
TOTAL ENERGY USAGE IN MONTH(kWh)					1413.6

ENERGY USAGE OF TUBE LIGHTS IN COLLEGE

Department/Room	APPLIANCES (A)	POWER	NO	OF	Avera	ENERG
AUDIO VISION AND	TUBE	40	7		0.66	5.544
AUDITORIUM	TUBE	40	21		0.66	16.632
BCA	TUBE	40	56		0.66	44.352
BOTANY	TUBE	40	16		0.66	12.672
HOSTEL (BOYS)	TUBE	40	23		0.66	18.216
CAMPUS	TUBE	40	31		0.66	24.552
CANTEEN	TUBE	40	18		0.66	14.256
CHAPPEL	TUBE	40	5		0.88	5.28
CHEMISTRY	TUBE	40	59		0.88	62.304
COMM ENGLISH SF	TUBE	40	7		0.88	7.392
COMMERCE	TUBE	40	49		0.88	51.744
COMPUTER LAB	TUBE	40	17		0.88	17.952
DINING AREA AND EXAM	TUBE	40	6		0.66	4.752
ECONOMICS	TUBE	40	14		0.66	11.088
ENGLISH	TUBE	40	5		0.66	3.96
HINDI	TUBE	40	4		0.66	3.168
IQAC	TUBE	40	1		0.66	0.792
KIOSK	TUBE	40	1		0.12	0.144
HOSTEL(LADIES)	TUBE	40	51		2.12	129.74
LIBRARY	TUBE	40	39		0.66	30.888
MALAYALAM	TUBE	40	14		0.66	11.088
MANAGER AND SUIT ROOM	TUBE	40	5		0.66	3.96
MATHEMATICS	TUBE	40	9		0.89	9.612
MCA	TUBE	40	40		0.66	31.68
MCA	TUBE	40	11		0.89	11.748
MHRM	TUBE	40	3		0.89	3.204
PHYSICS	TUBE	40	41		0.89	43.788
PRINCIPAL/ VICE	TUBE	40	17		2.26	46.104
PUNNAKOTTIL/SEMINAR	TUBE	40	22		0.86	22.704
STATISTICS	TUBE	40	11		0.89	11.748
TOURISM	TUBE	40	18		0.66	14.256
WASH ROOM (BOYS AND	TUBE	40	5		2.26	13.56
ZOOLOGY	TUBE	40	30		1.12	40.32
TOTAL ENERGY USAGE IN MONTH(kWh)						729.20

Nirmala College, Muvattupuzha

ENERGY USAGE OF COMMPUTERS IN THE COLLEGE						
Department/Room	APPLIANCES (A)	POWER	NO	OF	Avera	ENERG
BCA	COMPUTER WITH	180		76	2.06	845.42
	CPU	120		7	2.06	51.912
	LAPTOP	180		4	2.06	44.496
COMPUTER LAB	COMPUTER WITH	180		66	2.06	734.18
BOTANY	COMPUTER WITH	180		3	2.06	33.372
	LAP TOP	150		1	2.06	9.27
BOYS HOSTEL	COMPUTER WITH	150		2	1.5	13.5
BURSAR	COMPUTER WITH	180		1	2.06	11.124
CHEMISTRY	COMPUTER WITH	180		7	2.06	77.868
COMMERCE	COMPUTER WITH	180		6	1.16	37.584
	LAPTOP	150		1	2.06	9.27
COMMERCE(SF)	CPU	120		1	2.06	7.416
CONFERENCE HALL	COMPUTER WITH	180		8	2.06	88.992
DIGITAL LIBRARY	COMPUTER WITH	180		18	2.06	200.23
ECONOMICS	COMPUTER WITH	250		2	2.06	30.9
	LAPTOP	12		1	2.06	0.7416
ENGLISH	LAPTOP	12		1	2.06	0.7416
HINDI	COMPUTER WITH	150		4	2.06	37.08
	LAPTOP	12		1	2.06	0.7416
IGNOU	COMPUTER WITH	180		1	2.06	11.124
IQAC	COMPUTER WITH	180		1	2.06	11.124
LIBRARY FIRST FLOOR	COMPUTER WITH	180		7	2.06	77.868
MATHEMATICS	COMPUTER WITH	180		2	2.06	22.248
MCA COMPUTER LAB	COMPUTER WITH	180		77	2.06	856.54
MCA OFFICE	COMPUTER WITH	180		4	1.16	25.056
MHRM	COMPUTER WITH	180		3	1.16	18.792
PHYSICS	COMPUTER WITH	180		8	1.14	49.248
	LAPTOP	12		2	1.89	1.3608
PRINCIPAL/VICE	COMPUTER WITH	180		19	1.26	129.27
SEMINAR HALL	COMPUTER WITH	180		2	1.16	12.528
STATISTICS	COMPUTER WITH	180		9	1.16	56.376
ZOOLOGY	LAPTOP	12		2	1.16	0.8352
TOTAL ENERGY USAGE IN						3507.2

ENERGY USAGE OF PHOTOCOPIER IN COLLEGE						
Department/Room	APPLIANCES (A)	POWER	NO	OF	Avera	ENERG
EXAM ROOM	PHOTOSTAT	1200		1	0.66	23.76
IQAC	PHOTOSTAT	1200		1	0.66	23.76
OFFICE	PHOTOSTAT	1200		1	0.66	23.76
OFFICE ANNEX	PHOTOSTAT	1200		1	0.66	23.76
PHOTOSTAT ROOM	PHOTOSTAT	1200		1	0.66	23.76
VICE PRINCIPAL OFFICE	PHOTOSTAT	1200		1	0.66	23.76
TOTAL ENERGY USAGE IN						142.56

Nirmala College, Muvattupuzha

ENERGY USAGE OF INVERTERS IN COLLEGE

Department/Room	APPLIANCES (A)	POWER	NO	OF	Avera	ENERG
BCA	INVERTER/UPS	1000		6	0.26	46.8
BOTANY	INVERTER/UPS	1000		1	0.26	7.8
BURSAR	INVERTER/UPS	1000		1	0.26	7.8
COMMERCE	INVERTER/UPS	1000		1	0.26	7.8
COMMERCE(SF)	INVERTER/UPS	1000		1	0.26	7.8
COMPUTER LAB	INVERTER/UPS	850		1	0.26	6.63
	INVERTER/UPS	1000		1	0.26	7.8
DINING AREA	INVERTER/UPS	1000		1	0.26	7.8
LADIES HOSTEL	INVERTER/UPS	1000		1	0.26	7.8
	INVERTER/UPS	1000		1	0.26	7.8
OFFICE ANNEX	INVERTER/UPS	1000		1	0.26	7.8
PRINCIPAL OFFICE	INVERTER/UPS	1000		1	0.26	7.8
VICE PRINCIPAL OFFICE	INVERTER/UPS	1000		1	0.26	7.8
ZOOLOGY	INVERTER/UPS	3000		1	0.26	23.4
BOYS HOSTEL	INVERTER/UPS	2000		2	0.26	31.2
BOYS TOILET	INVERTER/UPS	1000		1	0.26	7.8
LIBRARY GROUND FLOOR	INVERTER/UPS	1000		3	0.26	23.4
DIGITAL LIBRARY	INVERTER/UPS	2000		1	0.26	15.6
	INVERTER/UPS	3000		2	0.26	46.8
	INVERTER/UPS	1000		3	0.26	23.4
ECONOMICS	INVERTER/UPS	2000		1	0.26	15.6
MCA	INVERTER/UPS	1000		1	0.26	7.8
MCA BLOCK	INVERTER/UPS	5000		1	0.26	39
PHYSICS	INVERTER/UPS	3000		1	0.26	23.4
STATISTICS	INVERTER/UPS	1000		1	0.26	7.8
	INVERTER/UPS	1000		1	0.26	7.8
BCA	INVERTER/UPS	1000		20	0.26	156
HINDI	INVERTER/UPS	1000		1	0.26	7.8
STATISTICS	INVERTER/UPS	1000		2	0.26	15.6
	TOTAL ENERGY USAGE IN MONTH(kWh)					591.63

ENERGY USAGE OF HEATERS IN COLLEGE

Department/Room	APPLIANCES (A)	POWER	NO	OF	Avera	ENERG
BOTANY	HOT AIR OVEN	1000		1	0.33	9.9
	AUTO CLAVE	600		1	0.66	11.88
BOYS HOSTEL	HEATER	1000		3	1	90
	IRON BOX	750		3	1	67.5
CHEMISTRY	DISTILLED WATER	1000		1	0.33	9.9
	DRYER	500		1	0.33	4.95
	HEATING MANTLE	1000		1	0.33	9.9
	HOT AIR OVEN	1200		2	0.33	23.76
	OVEN	750		1	0.16	3.6
CHEMISTRY RESEARCH	HEATING MANTLE	200		1	0.33	1.98

Nirmala College, Muvattupuzha

LAB	INCUBATOR	250	1	0.66	4.95
DINING AREA	INDUCTION COOKER	1800	1	0.16	8.64
GROUND FLOOR	COFFEE MAKER	750	1	0.16	3.6
KIOSK	TEA MAKER	1000	1	0.16	4.8
LADIES HOSTEL	INDUCTION COOKER	1600	1	0.16	7.68
	OVEN	2000	1	0.33	19.8
PHYSICS	DISTILLED WATER	250	1	0.66	4.95
	HOT AIR OVEN	750	1	0.3	6.75
	INCUBATOR	200	1	0.66	3.96
	MUFFLE FURNACE	3000	1	0.16	14.4
ZOOLOGY	DISTILLED WATER	1000	1	0.16	4.8
	WAX BATH	1200	1	0.13	4.68
	AUTO CLAVE	1500	1	0.16	7.2
	INCUBATOR	1000	2	0.11	6.6
TOTAL ENERGY USAGE IN MONTH(kWh)					336.18

ENERGY USAGE OF TELEVISIONS IN COLLEGE

Department/Room	APPLIANCES (A)	POWER	NO	OF	Avera	ENERG
BCA	LED/LCD T V	55	2		0.66	2.178
BOTANY	LED/LCD T V	55	2		0.66	2.178
BOYS HOSTEL	CRT TV	150	1		0.66	2.97
	LED/LCD T V	55	2		0.33	1.089
BURSAR	LED/LCD T V	55	1		0.11	0.1815
COMMERCE	LED/LCD T V	55	1		0.33	0.5445
CORRIDOR	LED/LCD T V	55	1		0.16	0.264
ECONOMICS	LED/LCD T V	55	1		0.16	0.264
ENGLISH	LED/LCD T V	55	1		0.16	0.264
GYM	LED/LCD T V	55	1		0.33	0.5445
LADIES HOSTEL	LED/LCD T V	50	1		0.33	0.495
LIBRARY FIRST FLOOR	LED/LCD T V	60	1		0.33	0.594
	CRT TV	60	1		0.16	0.288
MAIN AUDITORIUM	LED/LCD T V	60	1		0.18	0.324
MCA OFFICE	LED/LCD T V	70	1		0.18	0.378
PRINCIPAL OFFICE	LED/LCD T V	60	2		0.16	0.576
VIP ROOM	LED/LCD T V	60	1		0.11	0.198
TOTAL ENERGY USAGE IN MONTH(kWh)						13.330

ENERGY USAGE OF AMPLIFIERS AND CCTV DVR IN COLLEGE

Department/Room	APPLIANCES (A)	POWER	NO	OF	Avera	ENERG
AUDIO VISION HALL	AMPLIFIER	250	1		0.16	1.2
AUDITORIUM (DJ BLOCK)	AMPLIFIER	1000	2		0.1	6
BURSAR	DVR + CCTV camera	250	1		24	180
COMMERCE(SF)	AMPLIFIERS	1000	1		0.16	4.8
LADIES HOSTEL	AMPLIFIER	250	1		0.16	1.2
MAIN AUDITORIUM	POWER AMPLIFIER	1500	1		0.51	22.95
	AMPLIFIER	1000	1		0.66	19.8
	TUNING SYSTEM	60	1		0.57	1.026

Nirmala College, Muvattupuzha

MCA	AMPLIFIER	1500	2	0.66	59.4	
MCA (AUDITORIUM)	AMPLIFIER	2000	2	0.55	66	
PUNNAKOTTIL HALL	AMPLIFIER	500	1	0.22	3.3	
SEMINAR HALL	AMPLIFIER	200	2	0.25	3	
TOTAL ENERGY USAGE IN MONTH(kWh)					368.67	
ENERGY USAGE OF OTHER ELECTRICAL EQUIPMENTS IN COLLEGE						
Department/Room	APPLIANCES (A)	POWER	NO	OF	Avera	ENERG
AUDIO VISION HALL	LCD PROJECTOR	250	2		0.15	2.25
AUDITORIUM (DJ BLOCK)	PROJECTOR	250	1		0.15	1.125
BCA	24 PORT SWTICH	220	1		1.66	10.956
	MODEM	20	1		1.66	0.996
	MODEM	20	1		1.65	0.99
	PRINTER	50	3		1.66	7.47
	PROJECTOR	250	1		1.5	11.25
	STABILISER	40	3		3.33	11.988
BOTANY	CENTRIFUGE	250	1		0.16	1.2
	ELECTRONIC	50	1		0.1	0.15
	FRIDGE	250	1		5	37.5
	FRIDGE	250	1		3.33	24.975
	LAMINAR CHAMBER	300	1		0.15	1.35
	PRINTER	50	2		0.16	0.48
	SAUXHLET	1500	1		0.25	11.25
	SCANNER	50	1		0.16	0.24
BOYS HOSTEL	FRIDGE	180	3		22	356.4
	PRINTER	25	1		0.16	0.12
	WASHING MACHINE	50	1		0.25	0.375
BURSAR	PRINTER	700	1		0.16	3.36
CANTEEN	FREEZER	600	2		24	864
	GRINDER	1200	1		0.28	10.08
	MIXER GRINDER	900	1		0.14	3.78
CHEMISTRY	CENTRIFUGE	60	2		0.14	0.504
	CENTRIFUGE	180	1		0.33	1.782
	COLORIMETER	150	1		0.15	0.675
	CONDUCTIVITY	140	3		0.11	1.386
	FRIDGE	180	1		22	118.8
	LAMINAR FLOW	500	1		0.1	1.5
	PH METER	140	1		0.12	0.504
	PRINTER	750	1		0.22	4.95
	PRINTER	750	3		0.12	8.1
	PROJECTOR	250	1		0.26	1.95
	ROTARY PUMP	740	1		0.13	2.886
	SCANNER	60	1		0.16	0.288
	WEIGHING MACHINE	20	3		0.16	0.288
	WEIGHING MACHINE	20	2		0.16	0.192
	WEIGHING MACHINE	20	2		0.16	0.192

Nirmala College, Muvattupuzha

CHEMISTRY RESEARCH LAB	FRIDGE	180	1	22	118.8
	MAGNETIC STIRRER	600	2	0.16	5.76
	MELTING POINT	150	1	0.16	0.72
	ROTARY	120	1	0.33	1.188
	TEMPRATURE	750	1	0.33	7.425
	UV CABINET	400	1	0.16	1.92
	UV DISINFECTION	400	1	0.16	1.92
	WAVE REFLECTOR	96	1	0.16	0.4608
COMM.ENG	PRINTER	750	1	0.11	2.475
COMMERCE	MODEM	20	1	3.33	1.998
	PRINTER	50	2	0.16	0.48
	PROJECTOR	250	1	0.66	4.95
COMMERCE(SF)	MODEM	20	1	3.33	1.998
	PRINTER	50	1	0.66	0.99
	PROJECTOR	250	1	1.33	9.975
COMPUTER LAB	PRINTER	20	6	0.33	1.188
CONFERENCE HALL	PURIFIER	500	1	3.33	49.95
CORRIDOR	COOLER	450	2	3.33	89.91
	COOLER	1000	1	3.33	99.9
	COOLER	600	1	3.33	59.94
	LAMP	60	2	0.66	2.376
DIGITAL LIBRARY	PRINTER/SCANNER	50	1	0.1	0.15
	PROJECTOR	270	1	0.14	1.134
	SWITCH -24 PORT	240	2	3.33	47.952
DINING AREA	FRIDGE	150	1	22	99
ECONOMICS	printer	750	1	1.6	36
	STABILIZER	50	1	3.33	4.995
	WIFI ROUTER	10	17	3.33	16.983
ENGLISH	PRINTER	50	1	0.33	0.495
	SCANNER	50	1	0.33	0.495
FIRST FLOOR	WATER COOLER	150	2	3.33	29.97
	MODEM	20	1	3.33	1.998
GROUND FLOOR	PRINTER	20	2	0.33	0.396
	PRINTER	50	2	0.33	0.99
HINDI	FRIDGE	750	1	22	495
KIOSK	FREEZER	150	1	22	99
LADIES HOSTEL	FRIDGE/ DEEP	300	1	22	198
LIBRARY FIRST FLOOR	BARCODE SCANNER	25	1	0.1	0.075
	PRINTER	5	2	9	2.7
MAIN AUDITORIUM	DISCO LAMP	850	1	0.33	8.415
MATHEMATICS	MODEM	1000	6	3.33	599.4
	PRINTER	20	1	0.33	0.198
MCA	PROJECTOR	50	1	0.33	0.495
	SCANNER	250	1	0.33	2.475
	PRINTER	50	1	0.36	0.54

Nirmala College, Muvattupuzha

MCA (AUDITORIUM)	PRINTER	750	2	2.26	101.7
MCA BLOCK	PROJECTOR	250	3	1.56	35.1
MCA OFFICE	PROJECTOR	250	5	2.26	84.75
MCA VIP ROOM	PRINTER	400	1	0.66	7.92
MHRM	PRINTER	750	2	1.16	52.2
OFFICE	PRINTER	250	1	0.68	5.1
OFFICE ANNEX	PRINTER	750	3	1.66	112.05
PHYSICS	CRO	750	1	0.66	14.85
	CRO	50	4	2.41	14.46
	ELIMINATOR	4	4	3.33	1.5984
	FRIDGE	180	1	0.66	3.564
	FUME CUPBOARD	750	1	3.66	82.35
	MAGNETIC STIRRER	200	1	0.66	3.96
	MERCURY VAPOUR	400	1	0.66	7.92
	MERCURY VAPOUR	100	2	1.26	7.56
	mirror galvanometer	100	2	1.26	7.56
	printer	750	1	0.66	14.85
	SCANNER	750	2	1.26	56.7
	SIGNAL GENERATOR	75	1	0.66	1.485
	SODIUM VAPOUR	50	4	2.26	13.56
	SODIUM VAPOUR	150	1	0.66	2.97
	UV	150	1	0.66	2.97
WEIGHING MACHINE	170	1	0.56	2.856	
PRINCIPAL OFFICE	DVD	10	1	0.56	0.168
	FAX MACHINE	10	1	0.56	0.168
	PRINTER		1	0.66	0
PUNNAKOTTIL HALL	PROJECTOR	2	1	0.1	0.006
	WATER COOLER	300	1	0.1	0.9
SECOND FLOOR	MODEM		1	0.76	0
SEMINAR HALL	PROJECTOR	5	1	0.76	0.114
	PROJECTOR	250	1	0.76	5.7
STATISTICS	16 PORT SWITCH	250	1	0.76	5.7
	8 PORT SWITCH	40	1	0.76	0.912
	MODEM	40	1	0.56	0.672
VICE PRINCIPAL OFFICE	ID CARD PRINTER	400	1	0.76	9.12
	SCANNER	750	1	0.76	17.1
VIP ROOM	PURIFIER	60	1	0.56	1.008
	WASHING MACHINE	500	1	0.56	8.4
ZOOLOGY	CENTRIFUGE	2000	1	0.57	34.2
	CENTRIFUGE	250	1	0.56	4.2
	CENTRIFUGE	250	1	0.55	4.125
	CONDUCTIVITY	250	1	0.76	5.7
	CXL MONO	250	1	0.76	5.7
	COLORIMETER	20	1	0.56	0.336
	COLORIMETER	50	3	1.66	7.47

Nirmala College, Muvattupuzha

	PH METER	10	1	0.56	0.168
	ELECTROPHORESIS	50	1	0.56	0.84
	FRIDGE	200	2	1.66	19.92
	LAMINAR FLOW	750	1	1.62	36.45
	printer	250	1	1.66	12.45
	projector	400	1	1.66	19.92
	rotary shaker	250	1	1.66	12.45
	SCANNING MINISPEC	60	1	1.66	2.988
	SCANNER	50	1	1.66	2.49
	THERMOSTAT	750	1	1.66	37.35
	TRANSILLUMINATOR	140	1	1.66	6.972
TOTAL ENERGY USAGE IN MONTH(kWh)					4519.0

Electricity saving methods adopted in the college

- ✓ Turn off electrical equipments when not in use
- ✓ Use energy efficient light-emitting diode (LED) bulbs instead of incandescent and CFL bulbs
- ✓ Maintain appliances and replace old appliances.
- ✓ Use computers and electronic equipments in power saving mode.
- ✓ Solar energy generation at a level of 100 kWh per day.

Waste Generation

- ❖ Total Stakeholders – 2903
- ❖ Class rooms – 83
- ❖ Staff rooms - 18
- ❖ Office rooms – 10
- ❖ Laboratories – 12
- ❖ Kitchen - 4
- ❖ E-wastes- computers, electrical and electronic parts – Disposal by selling
- ❖ Plastic waste- disposal by selling
- ❖ Solid wastes – Damaged furniture, paper waste, paper plates, food wastes – disposal by selling
- ❖ Chemical wastes – Laboratory waste – No treatment
- ❖ Waste water – washing, urinals, bathrooms in soak pits

- ❖ Glass waste – Broken glass wares from the labs to municipal waste collection centers.
- ❖ Earning from selling of waste – Rs. 10000/year
- ❖ Napkin incinerators -3

Quantity of waste generated:-

- ❖ Biodegradable – 8.5 kg/day (office and class rooms)
- ❖ Non biodegradable –2 kg/day “ “
- ❖ Biodegradable – 2 kg/day (labs)
- ❖ Non-biodegradable – ½ kg/day (labs)
- ❖ Hazardous waste –110 gm/day (labs)
- ❖ E-waste collected – 128.2 Kg/year
- ❖ Unused equipments (Collected during the audit period)– 328 Kg
- ❖ Glass waste – 42 Kg/year
- ❖ Dry leaves – 84 Kg/day
- ❖ Napkins (number) – 205/day (burning by incinerators)

Canteen waste

- ❖ Biodegradable college canteen – 21 kg/day
- ❖ Non biodegradable – 2 kg/day

Waste treatment systems in place

Plastic shredding unit

Initiation of vermicomposting

Initiation of Bio gas plant

Canteen waste is used in piggery

Composting

Office and Class rooms

Approx	Bio degradable	Non-Bio	Hazardous	Others
< 1 kg.				
2-10 Kg	8.5kg/day	2kg/day	-	-

Laboratories

Approx	Bio degradable	Non-Bio	Hazardous	Others
< 1 kg.		500gm	110g/day	
2-10 Kg	2kg/day			

Canteen/kitchen

Approx	Bio degradable	Non-Bio	Hazardous	Others
< 1 kg.				
2-10 Kg		2kg/day		
	21kg/day			

Suggestion to Reduce Waste

- a). Reduce the use of paper cups and plastic coated plates in canteen by introducing steel cups and plates
- b) Implementing biogas plants in canteen

c) Green Campus

- Botanical Garden : 7 cent
- Herbal Garden : 25 cent
- Spices Garden : 20cent
- Biodiversity Garden(Santhisthal) : 10cent
- Medicinal Garden : 5 cent
- Vegetable garden : 50 cent
- Mushroom House :0.5 cent

Total number of plant species identified – 462

Tree cover of the campus - 96517.37 m²

Free space in the campus – 82268.94 m²

Garden area inside the college – 4532.48 m² (1.175 Acres)

Total campus area – 214483.68 m² (53 Acres)

CAMPUS FLORA

Sl.No	Name of plants	No. of plants
1	<i>Abelmoschus esculentus</i>	50
2	<i>Acacia mangium</i>	10
3	<i>Acacia pycnanth</i>	5
4	<i>Acalypha wilkesiana</i>	5
5	<i>Achras sapota</i>	3

Nirmala College, Muvattupuzha

6	<i>Acorus calamus</i>	2
7	<i>Adenantha pavonica</i>	5
8	<i>Adhatoda vasica</i>	5
9	<i>Agave sp.</i>	5
10	<i>Aglaonema sp.</i>	10
11	<i>Agrostistachys indica</i>	1
12	<i>Ailanthus excelsa</i>	5
13	<i>Albizia chinensis</i>	5
14	<i>Aleurites moluccana</i>	2
15	<i>Allamanda cathartica</i>	55
16	<i>Aloe vera</i>	5
17	<i>Alpinia galanga</i>	5
18	<i>Alpinia nutan</i>	5
19	<i>Alstonia scholaris</i>	3
20	<i>Alternanthera brasiliana</i>	40
21	<i>Amorphophallus paeoniifolius</i>	10
22	<i>Anacardium occidentale</i>	5
23	<i>Ananas comosus (Pineapple)</i>	100
24	<i>Annona muricata</i>	1
25	<i>Anthocephalus cadamba</i>	2
26	<i>Anthurium species</i>	20
27	<i>Antidesma acidum</i>	3
28	<i>Antigonon leptopus</i>	2
29	<i>Aphanamixis polystachya</i>	1
30	<i>Aporosa lindleyana</i>	1
31	<i>Arachis pintoii</i>	500
32	<i>Aralia sp.</i>	10
33	<i>Areca catechu</i>	46
34	<i>Areca palma</i>	10
35	<i>Aristolochia indica</i>	5
36	<i>Artabotrys hexapetalus</i>	1
37	<i>Artabotrys odoratissimus</i>	1
38	<i>Artocarpus heterophyllus</i>	30
39	<i>Artocarpus hirsuta</i>	125
40	<i>Artocarpus integrifolia</i>	10
41	<i>Asparagus racemosus</i>	2
42	<i>Azadirachta indica</i>	2
43	<i>Bacopa monieri</i>	50
44	<i>Balliospermum montanum</i>	2
45	<i>Bambusa glaucophylla</i>	2
46	<i>Bambusa sp.</i>	2
47	<i>Bauhinia variegata</i>	2
48	<i>Bauhinia acuminata</i>	2

Nirmala College, Muvattupuzha

49	<i>Bauhinia tomentosa</i>	1
50	<i>Begonia sp.</i>	10
51	<i>Bignonia sp.</i>	2
52	<i>Blumea mollis</i>	10
53	<i>Bombax malabaricum</i>	
54	<i>Bougainvillea sp.</i>	50
55	<i>Brassica oleracea</i>	25
56	<i>Bridelia retusa</i>	2
57	<i>Brunfelsia calycinae</i>	1
58	<i>Cactus sp.</i>	2
59	<i>Caesalpinia coronaria- divi-divi</i>	2
60	<i>Caesalpinia pulcherrima</i>	3
61	<i>Calliandra rheedii</i>	2
62	<i>Callistemon lanceolatus</i>	1
63	<i>Calophyllum inophyllum- Punna</i>	1
64	<i>Cananga odorata</i>	2
65	<i>Canarium strictum</i>	1
66	<i>Canna indica</i>	15
67	<i>Capsicum annum</i>	10
68	<i>Capsicum frutescens</i>	15
69	<i>Carallia brachiata</i>	1
70	<i>Carica papaya</i>	15
71	<i>Cascabela thevetia</i>	1
72	<i>Cassia fistula</i>	13
73	<i>Casuarina equisetifolia</i>	5
74	<i>Centella asiatica</i>	28
75	<i>Chrysanthemum sp.</i>	5
76	<i>Chrysophyllum cainito</i>	2
77	<i>Cinnamomum verum –Lauraceae- Edana</i>	2
78	<i>Cinnamomum zeylanicum</i>	1
79	<i>Cissus quadrangularis</i>	1
80	<i>Citharexylum subserratum-paarijatham</i>	1
81	<i>Citrus limon</i>	3
82	<i>Clematis elliptica</i>	2
83	<i>Clerodendrum thomsoniae</i>	10
84	<i>Clitoria ternatea</i>	2
85	<i>Coccinea grandis</i>	2
86	<i>Cocos nucifera</i>	360
87	<i>Codium variegatum</i>	2
88	<i>Coffea arabica</i>	150
89	<i>Coleus aromaticus</i>	5
90	<i>Colocasia esculenta</i>	25
91	<i>Coriandrum sativum</i>	5

Nirmala College, Muvattupuzha

92	<i>Costus pictus</i>	5
93	<i>Couroupita guianensis</i>	1
94	<i>Crossandra infundibuliformis</i>	1
95	<i>Croton sp.</i>	25
96	<i>Cuphea minuta</i>	10
97	<i>Curcuma longa</i>	2
98	<i>Cuscuta reflexa</i>	2
99	<i>Cycas circinalis</i>	1
100	<i>Cycas revoluta</i>	1
101	<i>Cymbopogon citratus</i>	2
102	<i>Cyrtostachys renda- Red palm</i>	5
103	<i>Dalbergia latifolia</i>	1
104	<i>Dalbergia sisso</i>	1
105	<i>Datura metel</i>	1
106	<i>Delonix regia</i>	1
107	<i>Derris trifoliata</i>	1
108	<i>Dieffenbachia sanguine</i>	15
109	<i>Dillenia bracteolate</i>	1
110	<i>Dillenia indica</i>	1
111	<i>Dioscorea esculenta</i>	5
112	<i>Diospyros blancoi- velvet apple</i>	1
113	<i>Diospyros peregrine</i>	1
114	<i>Dracaena braunii</i>	5
115	<i>Dracaena fragrans</i>	2
116	<i>Dracaena sp.</i>	5
117	<i>Duranta plumieri</i>	2
118	<i>Duranta repens</i>	2
119	<i>Elettaria cardamomum</i>	10
120	<i>Emblicaofficinalis</i>	2
121	<i>Ervatamia coronaria</i>	1
122	<i>Erythrina indica</i>	1
123	<i>Erythroxylum monogynum-</i>	
124	<i>Eugenia jambos</i>	3
125	<i>Euodia lunu-ankenda</i>	1
126	<i>Euphorbia hirta</i>	50
127	<i>Euphorbia rothieri</i>	5
128	<i>Euphorbia sp.</i>	5
129	<i>Evodia lunuankenda</i>	2
130	<i>Evodia roxburghiana</i>	1
131	<i>Exoecaria bicolor-</i>	1
132	<i>Felicism decipiens</i>	1
133	<i>Ficus asperrima</i>	2
134	<i>Ficus auriculata</i>	1

Nirmala College, Muvattupuzha

135	<i>Ficus bengalensis</i>	2
136	<i>Ficus benjamina</i>	1
137	<i>Ficus elastic</i>	4
138	<i>Ficus hispida</i>	10
139	<i>Ficus racemosa</i>	1
140	<i>Ficus religiosa</i>	2
141	<i>Filicium decipiens</i>	1
142	<i>Flacourtia montana</i>	1
143	<i>Garcinia gummi-gutta</i>	2
144	<i>Garcinia mangostana</i>	1
145	<i>Gardenia gummifera</i>	3
146	<i>Gardenia jasminoides</i>	5
147	<i>Gliricidia maculata</i>	1
148	<i>Glycosmis pentaphylla</i>	5
149	<i>Hamelia patens</i>	1
150	<i>Helicteres isora</i>	2
151	<i>Hevea brasiliensis</i>	200
152	<i>Hibiscus rosa-sinensis</i>	15
153	<i>Holmskioldia sanguinea</i>	1
154	<i>Holoptelea integrifolia</i>	2
155	<i>Holorrhena antidysenterica</i>	1
156	<i>Hopea parviflora</i>	2
157	<i>Humboldtia brunonis</i>	1
158	<i>Hylocereus undatus</i>	1
159	<i>Hypoestes phyllostachya</i>	1
160	<i>Impatiens balsamina</i>	10
161	<i>Indigofera sp.</i>	1
162	<i>Ixora chinensis</i>	5
163	<i>Ixora coccinea</i>	5
164	<i>Ixora philippinensis</i>	2
165	<i>Jasminum angustifolium</i>	1
166	<i>Jasminum grandiflorum</i>	5
167	<i>Jasminum rigidum</i>	2
168	<i>Justicia beddomei</i>	25
169	<i>Justicia gendarussa</i>	15
170	<i>Kaempferia galangal</i>	2
171	<i>Kleinhovia hospita</i>	2
172	<i>Kopsia fruticose</i>	1
173	<i>Lagerstroemia flos reginae</i>	2
174	<i>Lagerstroemia microcarpa</i>	1
175	<i>Lannea coromandelica</i>	1
176	<i>Lantana camara</i>	25
177	<i>Lawsonia inermis</i>	2

Nirmala College, Muvattupuzha

178	<i>Lepisanthes teraphylla</i>	1
179	<i>Lycopersicum esculentum</i>	25
180	<i>Macaranga peltata</i>	1
181	<i>Madhuca neriifolia</i>	1
182	<i>Mangifera indica</i>	40
183	<i>Manihot esculenta</i>	25
184	<i>Manilkara zapota</i>	2
185	<i>Marsilea quadrifolia</i>	5
186	<i>Meiogyne panosa</i>	2
187	<i>Melastoma malabathricum</i>	10
188	<i>Mentha piperita</i>	2
189	<i>Mesua thwaitesii</i>	1
190	<i>Michelia champaca</i>	2
191	<i>Millingtonia hortensis</i>	2
192	<i>Mimusops elengi</i>	31
193	<i>Momordica charantia</i>	2
194	<i>Moringa oleifera</i>	5
195	<i>Morua alba</i>	5
196	<i>Murraya exotica</i>	5
197	<i>Murraya koenigii</i>	2
198	<i>Musa paradisiacal</i>	200
199	<i>Mussaenda erythrophylla</i>	5
200	<i>Mussaenda frondosa</i>	2
201	<i>Myristica fragrans</i>	12
202	<i>Naregamia alata</i>	5
203	<i>Nelumbium speciosum</i>	2
204	<i>Nephelium lappaceum</i>	11
205	<i>Nephelium mutabile</i>	2
206	<i>Nerium indicum</i>	10
207	<i>Nymphaea pubescens</i>	5
208	<i>Ochna obtusata</i>	
209	<i>Ocimum basilicum</i>	10
210	<i>Olea dioica</i>	
211	<i>Olea dioica- Karivetti</i>	1
212	<i>Oroxylum indicum</i>	
213	<i>Oscimum sanctum</i>	10
214	<i>Osmoxylon lineare</i>	10
215	<i>Oxalis purpurea</i>	50
216	<i>Pachystachys lutea</i>	5
217	<i>Palm sp.</i>	2
218	<i>Pandanus odoratissimus</i>	2
219	<i>Passiflora miniata</i>	2
220	<i>Passiflora sp</i>	5

Nirmala College, Muvattupuzha

221	<i>Pedilanthus tithymaloides</i>	10
222	<i>Peltophorum ferrugineum</i>	35
223	<i>Peltophorum pterocarpum</i>	10
224	<i>Peltophorum roxburghii</i>	10
225	<i>Phaseolus vulgaris</i>	5
226	<i>Pholidota imbricata</i>	1
227	<i>Pimenta dioica</i>	2
228	<i>Piper longum</i>	5
229	<i>Pipper nigrum</i>	5
230	<i>Pithecellobium saman</i>	2
231	<i>Plinia cauliflora</i>	1
232	<i>Plumbago indica</i>	5
233	<i>Plumbago zeylanicus</i>	2
234	<i>Plumeria acutifolia</i>	4
235	<i>Plumeria indica</i>	5
236	<i>Poeciloneuron indicum</i>	1
237	<i>Poinsettia pulcherrima</i>	2
238	<i>Polyalthia longifolia</i>	5
239	<i>Poncirus trifoliata</i>	2
240	<i>Pongamia glabra</i>	5
241	<i>Pongamia pinnata</i>	2
242	<i>Pouteria campechiana</i>	1
243	<i>Psidium guajava</i>	15
244	<i>Punica granatum</i>	1
245	<i>Quisqualis indica</i>	2
246	<i>Rauvolfia serpentina</i>	2
247	<i>Rhoeo discolor</i>	10
248	<i>Ricinus communis</i>	2
249	<i>Rivina humilis</i>	5
250	<i>Rosa sp.</i>	5
251	<i>Roystonea regia</i>	10
252	<i>Salacia fruticosa</i>	2
253	<i>Salvia officinalis</i>	5
254	<i>Sansevieria sp.</i>	10
255	<i>Saraca india</i>	2
256	<i>Sauropus quadrangularis</i>	5
257	<i>Schefflera arboricola</i>	10
258	<i>Schleichera oleosa</i>	2
259	<i>Simarauba glauca</i>	2
260	<i>Solanum melongena</i>	5
261	<i>Spathodea campanulata</i>	2
262	<i>Spathoglottis sp</i>	10
263	<i>Spathyphyllum</i>	3

Nirmala College, Muvattupuzha

264	<i>Spondias indica</i>	2
265	<i>Stereospermum suaveolens</i>	1
266	<i>Stereospermum colais</i>	2
267	<i>Strelitzia reginae</i>	1
268	<i>Strobilanthus ciliates</i>	15
269	<i>Strychnos nux-vomica</i>	1
270	<i>Sweitenia mahagoni</i>	100
271	<i>Symplocos cochinchinensis</i>	2
272	<i>Syncephalum dulcificum</i>	1
273	<i>Syngonium podophyllum</i>	50
274	<i>Syzygium aqueum</i>	1
275	<i>Syzygium aromaticum</i>	1
276	<i>Syzygium cumini</i>	8
277	<i>Syzygium malaccense</i>	1
278	<i>Syzygium zeylanicum</i>	1
279	<i>Tabernaemontana dichotoma</i>	5
280	<i>Tamarindus indica</i>	7
281	<i>Tecoma stans</i>	2
282	<i>Tectona grandis</i>	15
283	<i>Terminalia arjuna</i>	2
284	<i>Terminalia bellirica</i>	2
285	<i>Terminalia catappa</i>	10
286	<i>Terminalia paniculata</i>	5
287	<i>Theobroma cocoa</i>	5
288	<i>Thevetia peruviana</i>	2
289	<i>Thottea siliquosa</i>	3
290	<i>Thuja sp.</i>	2
291	<i>Thunbergia erecta</i>	5
292	<i>Thunbergia laurifolia</i>	1
293	<i>Thymus vulgaris</i>	10
294	<i>Trema orientalis</i>	2
295	<i>Trichosanthes cucumerina</i>	2
296	<i>Uvaria narum</i>	2
297	<i>Vanilla planifolia</i>	5
298	<i>Vateria indica</i>	1
299	<i>Vigna radiata</i>	25
300	<i>Vinca rosea</i>	50
301	<i>Woodfordia fruticosa</i>	2
302	<i>Zingiber officinale</i>	10

BOTANICAL GARDEN

Sl.No	Name of Plants	No. of Plants
1	<i>Adenanthera pavonica</i>	1
2	<i>Adhatoda vasica</i>	3

Nirmala College, Muvattupuzha

3	<i>Aglaonema sp.</i>	10
4	<i>Allamanda cathartica</i>	5
5	<i>Anthurium species</i>	5
6	<i>Arachis pintoi</i>	many
7	<i>Aralia sp.</i>	5
8	<i>Asparagus racemosus</i>	1
9	<i>Bambusa glaucophylla</i>	1
10	<i>Bauhinia tomentosa</i>	2
11	<i>Bauhinia variegata</i>	1
12	<i>Begonia sp.</i>	2
13	<i>Bougainvillea sp.</i>	10
14	<i>Cactus sp.</i>	5
15	<i>Callistemon lanceolatus</i>	1
16	<i>Canna indica</i>	5
17	<i>Clematis elliptica</i>	2
18	<i>Clitoria ternatea</i>	2
19	<i>Cocos nucifera</i>	5
20	<i>Costus sp.</i>	7
21	<i>Costus spictus</i>	2
22	<i>Crossandra infundibuliformis</i>	1
23	<i>Croton sp.</i>	11
24	<i>Cuphea minuta</i>	7
25	<i>Cycas circinalis</i>	1
26	<i>Datura metel</i>	1
27	<i>Dieffenbachia sanguine</i>	1
28	<i>Dracaena braunii</i>	2
29	<i>Dracaena fragrans</i>	3
30	<i>Duranta plumieri</i>	1
31	<i>Duranta repens</i>	2
32	<i>Ervatamia coronaria</i>	2
33	<i>Poinsettia pulcherrima</i>	1
34	<i>Gardenia gummifera</i>	3
35	<i>Gardenia jasminoides</i>	2
36	<i>Hamelia patens</i>	1
37	<i>Hibiscus rosa-sinensis</i>	3
38	<i>Holmskioldia sanguinea</i>	1
39	<i>Hypoestes phyllostachya</i>	3
40	<i>Ixora chinensis</i>	2
41	<i>Ixora philippinensis</i>	1
42	<i>Jasminum grandiflorum</i>	1
43	<i>Kopsia fruticosa</i>	1
44	<i>Lantana camara</i>	10
45	<i>Melastoma malabathricum</i>	5
46	<i>Murraya exotica</i>	2
47	<i>Nelumbium speciosum</i>	3

Nirmala College, Muvattupuzha

48	<i>Nerium indicum</i>	2
49	<i>Nymphaea pubescens</i>	2
50	<i>Osmoxylon lineare</i>	6
51	<i>Pachystachyslutea</i>	4
52	<i>Pandanus odoratissimus</i>	2
53	<i>Passiflora sp</i>	1
54	<i>Piper longum</i>	2
55	<i>Piper nigrum</i>	3
56	<i>Plumeria indica</i>	1
57	<i>Quisqualis indica</i>	2
58	<i>Rivina humilis</i>	4
59	<i>Rosa sp.</i>	2
60	<i>Salvia officinalis</i>	2
61	<i>Sansivieria sp.</i>	5
62	<i>Schefflera arboricola</i>	3
63	<i>Thevetia peruviana</i>	1
64	<i>Thuja sp.</i>	3
65	<i>Thunbergia laurifolia</i>	2
66	<i>Uvaria narum</i>	1
67	<i>Woodfordia fruticosa</i>	1

MEDICINAL PLANTS

Sl.No	Name of Plants	No. of Plants
1.	<i>Achyranthes aspera</i>	2
2.	<i>Adenantha pavonina</i>	5
3.	<i>Adhatoda vasica</i>	1
4.	<i>Aerva lanata</i>	6
5.	<i>Aloe vera</i>	5
6.	<i>Alpinia calcrata</i>	6
7.	<i>Alpinia galanga</i>	3
8.	<i>Alstonia scholaris</i>	4
9.	<i>Andrographis panicullata</i>	2
10.	<i>Anisomalous asiatica</i>	6
11.	<i>Asparagus racemosus</i>	2
12.	<i>Azadirachta indica</i>	3
13.	<i>Bacopa monieri</i>	4
14.	<i>Biophytum sesitivum</i>	3
15.	<i>Boerhavia diffusa</i>	5
16.	<i>Butea monosperma</i>	2
17.	<i>Calotropis gigantia</i>	2
18.	<i>Cardiospermum helicacabum</i>	5
19.	<i>Careya arborea</i>	8
20.	<i>Cassia fistula</i>	4
21.	<i>Cassia occidentalis</i>	2
22.	<i>Catharanthus roseus</i>	3

Nirmala College, Muvattupuzha

23.	<i>Centella asiatica</i>	6
24.	<i>Chasalia curviflora</i>	3
25.	<i>Cinnamomum zeylanicum</i>	6
26.	<i>Clerodendron viscosum</i>	3
27.	<i>Clitoria ternatea</i>	5
28.	<i>Coffea arabica</i>	2
29.	<i>Coriandrum sativum</i>	3
30.	<i>Costus spictus</i>	4
31.	<i>Curcuma longa</i>	1
32.	<i>Cycas circinalis</i>	2
33.	<i>Datura metel</i>	3
34.	<i>Datura stramonium</i>	5
35.	<i>Diospyros sp.</i>	4
36.	<i>Duranta plumieri</i>	5
37.	<i>Eclipta alba</i>	2
38.	<i>Elephantopus scaber</i>	2
39.	<i>Elettaria cardamomum</i>	3
40.	<i>Emblica officinalis</i>	2
41.	<i>Emelia sonchifolia</i>	3
42.	<i>Euphorbia hirta</i>	2
43.	<i>Evolvulus alsinoides</i>	2
44.	<i>Ficus benghalensis</i>	4
45.	<i>Ficus microcarpa</i>	4
46.	<i>Ficus racemosa</i>	3
47.	<i>Ficus religiosa</i>	2
48.	<i>Garcinia cambogia</i>	5
49.	<i>Heliotropium indicum</i>	2
50.	<i>Hemidesmus indicus</i>	1
51.	<i>Hibiscus rosa-sinensis</i>	3
52.	<i>Holoptelia integrifolia</i>	6
53.	<i>Holorrhena antidysenterica</i>	4
54.	<i>Hopea parviflora</i>	8
55.	<i>Ipomoea sepiaria</i>	3
56.	<i>Ixora coccinea</i>	6
57.	<i>Kaempferia galangal</i>	5
58.	<i>Lannea coromandelica</i>	4
59.	<i>Leucas aspera</i>	2
60.	<i>Mimosa pudica</i>	3
61.	<i>Murraya koenijii</i>	2
62.	<i>Myristica fragrans</i>	5
63.	<i>Nelumbium speciosum</i>	3
64.	<i>Ocimum basilicum</i>	5
65.	<i>Ocimum sanctum</i>	4

Nirmala College, Muvattupuzha

66.	<i>Oxalis corniculata</i>	2
67.	<i>Phyllanthus neruri</i>	3
68.	<i>Pimenta dioica</i>	6
69.	<i>Piper longum</i>	5
70.	<i>Plumbago rosea</i>	2
71.	<i>Pongamia pinnata</i>	3
72.	<i>Psidium guajava</i>	4
73.	<i>Rauvolfia serpentina</i>	2
74.	<i>Rosa indica</i>	3
75.	<i>Sansiviera roxburghiana</i>	1
76.	<i>Saraca indica</i>	3
77.	<i>Scoparia dulcis</i>	1
78.	<i>Strobilantus ciliatus</i>	2
79.	<i>Strychnos nuxvomica</i>	3
80.	<i>Syzygium aromaticum</i>	2
81.	<i>Terminalia catappa</i>	5
82.	<i>Tinospora cordifolia</i>	6
83.	<i>Tragia involucrata</i>	4
84.	<i>Tridax procumbens</i>	2
85.	<i>Vatteria indica</i>	3
86.	<i>Vernonia cineria</i>	5
87.	<i>Vitex negundo</i>	2
88.	<i>Zingiber officinale</i>	2

VEGETABLES CULTIVATED

Sl. No.	Name of plants	No. of plants
1.	<i>Abelmoschus esculentus</i> – ladies finger	10
2.	<i>Amaranthus spp</i> – cheera	5
3.	<i>Amorphophallus paeoniifolius</i> – chena	14
4.	<i>Benicasa hispoida</i> – kumblanga	5
5.	<i>Brassica oleracea</i> var.boatrytis – cauliflower	15
6.	<i>Brassica oleracea</i> var.capitata– cabbage	30
7.	<i>Capcicum annum</i> – chilly	32
8.	<i>Carica papaya</i> – papaya	7
9.	<i>Coccinia grandid</i> – koval	8
10.	<i>Colocasia esculenta</i> – chembu	25
11.	<i>Cucumis sativus</i> – cucumber	12
12.	<i>Cucurbita mellonia</i> – pumkin	8
13.	<i>Curcuma longa</i> – turmeric	25
14.	<i>Dioscorea alalta</i> – kachil	10
15.	<i>Diosscorea esculenta</i> – cheru kirange	9
16.	<i>Lagenaria siceraria</i> – bottle gourd	10

Nirmala College, Muvattupuzha

17.	<i>Lycopersicon esculentum – tomato</i>	13
18.	<i>Manihot esculenta – tapioca</i>	50
19.	<i>Momordica charantia – bitter melon</i>	10
20.	<i>Moringa oleifera – drum stick</i>	3

SPICES GARDEN

Sl. No.	Name of plants	No. of plants
1	<i>Elettaria cardamomum</i>	3
2	<i>Zingiber officinale</i>	5
3	<i>Curcuma longa</i>	8
4	<i>Cinnamomum zeylanicum</i>	1
5	<i>Punica granatum</i>	1
6	<i>Piper longum</i>	1
7	<i>Piper nigrum</i>	12
8	<i>Pimenta dioica</i>	2
9	<i>Garcinia cambogia</i>	1
10	<i>Myristica fragrans</i>	1
11	<i>Tamarindus indica</i>	2
12	<i>Nephelium mutabile</i>	1
13	<i>Garcinia mangostana</i>	2
14	<i>Achras sapota</i>	1
15	<i>Annona muricata</i>	1
16	<i>Syzygium samarangense</i>	1
17	<i>Mangifera indica</i>	3
18	<i>Psidium guajava</i>	1
19	<i>Simarouba glauca</i>	1
20	<i>Nephelium lappaceum</i>	1
21	<i>Cycas circinalis</i>	2
22	<i>Capsicum annum</i>	8

ORNAMENTAL PLANTS

Sl.no	Name of plants	No. of plants
1.	<i>Alstonia scholaris</i>	3
2.	<i>Bauhinia acuminata</i>	2
3.	<i>Biophytum sensitivum</i>	5
4.	<i>Calendula officianalis</i>	3
5.	<i>Cassia fistula</i>	6
6.	<i>Cesalpinia pulcherrima</i>	2
7.	<i>Clitoria ternatea</i>	5
8.	<i>Crosandra infundibuliformis</i>	3
9.	<i>Delonix regia</i>	4
10.	<i>Hibiscus rosasinesis</i>	5
11.	<i>Ixora coccinia</i>	3
12.	<i>Jasminum grandiflorum</i>	2

Nirmala College, Muvattupuzha

13.	<i>Jasminum officinale</i>	2
14.	<i>Maranta leuconeura</i>	5
15.	<i>Michelia chempaca</i>	2
16.	<i>Mimosa pudica</i>	8
17.	<i>Mirabilis jalapa</i>	2
18.	<i>Nelumbo nucifera</i>	3
19.	<i>Nerium indicum</i>	6
20.	<i>Nymphaea nouchali</i>	2
21.	<i>Ocimum sanctum</i>	3
22.	<i>Quisqualis indica</i>	4
23.	<i>Saraca indica</i>	2
24.	<i>Tabernaemontana divericata</i>	5
25.	<i>Vinca rosea – savam nari</i>	2
26.	Sansevieria trifasciata – snake plant	4
27.	Rhoeo spathacea – tricolor rhoeo	2
28.	Syngonium podophyllum – arrow head plant	3
29.	Begonia spp.	8
30.	Dracaena spp.	8
31.	Canna indicum	7
32.	Alamanda cathartica – kolambi	5
33.	Spathiphyllum wallisii	6
34.	Agave americana – agave	3

FRUIT YIELDING PLANTS

Sl. No.	Name of plants	No. of plants
1	<i>Ananus comosus</i>	5
2	<i>Annona muricata</i>	4
3	<i>Annona squamosa</i>	3
4	<i>Artocarpus integrifolia</i>	8
5	<i>Artocarpus hirsutus</i>	5
6	<i>Citrus limon</i>	4
7	<i>Garcinia mangostana</i>	3
8	<i>Hylocereus undatus</i>	2
9	<i>Mangifera indica</i>	3
10	<i>Morus alba</i>	2
11	<i>Musa paradiscum</i>	1
12	<i>Nephelium lappaceum</i>	2
13	<i>Nephelium mutabile</i>	1
14	<i>Passiflora edulis</i>	2
15	<i>Phyllanthus emblica</i>	4
16	<i>Psidium guava</i>	5
17	<i>Punica granatum</i>	6

Nirmala College, Muvattupuzha

18	<i>Spondias mombin</i>	2
19	<i>Syzygium jambos</i>	3
20	<i>Syzygium samarangense</i>	4
21	<i>Tamarindus indica</i>	2

GYMNOSPERMS

Sl. No.	Name of plants	No. of plants
1	<i>Cycas circinalis</i>	3
2	<i>Cycas revoluta</i>	2
3	<i>Podocarpus gracillior</i>	1
4	<i>Zamia sp.</i>	1

PTERIDOPHYTES

Sl. No.	Name of plants	No. of plants
1	<i>Adiantum</i>	5
2	<i>Angiopteris</i>	4
3	<i>Asplenium</i>	5
4	<i>Azolla</i>	3
5	<i>Cheilanthes</i>	4
6	<i>Cyclosorus</i>	6
7	<i>Dicranopteris</i>	3
8	<i>Drymoglossum</i>	5
9	<i>Drynaria</i>	6
10	<i>Equisetum</i>	4
11	<i>Lycopodium</i>	4
12	<i>Lygodium</i>	3
13	<i>Marsilea</i>	4
14	<i>Microlepia</i>	6
15	<i>Nephrolepis</i>	5
16	<i>Parahemionitis</i>	5
17	<i>Pityrogramma</i>	6
18	<i>Psilotum</i>	3
19	<i>Pteridium</i>	4
20	<i>Pteris</i>	8
21	<i>Pyrrosia</i>	6
22	<i>Salvinia</i>	3
23	<i>Selaginella</i>	5
24	<i>Tectaria</i>	4

PLANTS CULTIVATED BY STUDENTS

Sl. No	Name	No. of plants
1	<i>Abelmoschus esculentus</i>	5
2	<i>Achras sapota</i>	7

Nirmala College, Muvattupuzha

3	<i>Amaranthus sp.</i>	5
4	<i>Amorphophallus paeoniifolius</i>	6
5	<i>Ananus comosus</i>	2
6	<i>Annona muricata</i>	2
7	<i>Annona squamosa</i>	3
8	<i>Artocarpus hirsutus</i>	8
9	<i>Artocarpus integrifolia</i>	10
10	<i>Benicasa hispida</i>	6
11	<i>Capcicum annum</i>	5
12	<i>Carica papaya</i>	12
13	<i>Cinnamomum zeylanicum</i>	4
14	<i>Citrus limon</i>	5
15	<i>Colocasia esculenta</i>	6
16	<i>Cucumis sativus</i>	4
17	<i>Curcuma longa</i>	3
18	<i>Cycas circinalis</i>	3
19	<i>Elettaria cardamomum</i>	2
20	<i>Garcinia cambogia</i>	6
21	<i>Garcinia mangostana</i>	3
22	<i>Hylocereus undatus</i>	8
23	<i>Lycopersican esculentum</i>	3
24	<i>Mangifera indica</i>	12
25	<i>Manihot esculenta</i>	5
26	<i>Momordica charantia</i>	2
27	<i>Musa paradiscum</i>	4
28	<i>Myristica fragrans</i>	3
29	<i>Nephelium lappaceum</i>	4
30	<i>Nephelium mutabile</i>	2
31	<i>Passiflora edulis</i>	5
32	<i>Phyllanthus emblica</i>	4
33	<i>Pimenta dioica</i>	5
34	<i>Piper longum</i>	5
35	<i>Piper nigrum</i>	4
36	<i>Psidium guajava</i>	5
37	<i>Psidium guava</i>	2
38	<i>Punica granatum</i>	3
39	<i>Simarouba glauca</i>	4
40	<i>Solanum melongena</i>	5
41	<i>Spondias mombin</i>	2
42	<i>Syzygium jambos</i>	2
43	<i>Syzygium samarangense</i>	3
44	<i>Tamarindus indica</i>	8
45	<i>Zingiber officinale</i>	4

STAR PLANTS Garden

SI No	Zodiac Sign	Name of Plant
1	Aswathy	<i>Strychnos nux-vomica</i>
2	Bharani	<i>Phyllanthus emblica</i>
3	Karthika	<i>Ficus glomerata</i>
4	Rohini	<i>Syzygium cuminii</i>
5	Makayiram	<i>Acacia catechu</i>
6	Thiruvathira	<i>Diospyros cambodiana</i>
7	Punartham	<i>Bamboosa arundinaceae</i>
8	Pooyam	<i>Ficus religiosa</i>
9	Aayilyam	<i>Mesua ferrea</i>
10	Makam	<i>Ficus benghalensis</i>
11	Pooram	<i>Butea frondosa</i>
12	Uthram	<i>Ficus tinctoria</i>
13	Atham	<i>Spondias pinnata</i>
14	Chithira	<i>Aegle marmelos</i>
15	Chothy	<i>Terminalia arjuna</i>
16	Visakhham	<i>Garuga pinnata</i>
17	Anizham	<i>Mimusops elengi</i>
18	Thrikketta	<i>Aporusa lindleyana</i>
19	Moolam	<i>Pinus excelsa</i>
20	Pooradam	<i>Salix tetraspeama</i>
21	Uthradam	<i>Artocarpus heterophyllus</i>
22	Thiruvonam	<i>Calotropis gigantea</i>
23	Avittam	<i>Prosopis juliflora</i>
24	Chathayam	<i>Anthocephalus cadambu</i>
25	Pooruruttathi	<i>Mangifera indica</i>
26	Uthruttathi	<i>Borassus flabellifer</i>
27	Revathi	<i>Madhuca longifolia</i>

Nature awareness programmes in the campus

- 2016-2017 organic farming
- 2016-2017 Paddy cultivation
- Bio diversity club
- Engaging students in maintaining spices garden
- Engaging students in maintaining herbal garden and medicinal garden.
- Mushroom cultivation workshop.
- Apiculture workshop
- Flower arrangements workshop
- Plastic free campaign
- Workshop on eco-friendly carry bags
- Nature camps, field trips and

- Maintaining of shanthistal
- Participation of teachers in national green crops
- Initiation of vermicompost.
- Initiation of bio gas plant.
- Initiation of wick irrigation for grow bag cultivation.
- Invited talks on environment sustainability
- Switching from flex to cloth banners

Eco Friendly Activities During 2016-17

Sl.No.	Name of the activity	Organising unit/ agency/ collaborating agency
1.	Mushroom cultivation and sale of the organic produce	Dept.of Botany
2.	A Restoration Programme of Santhukad SreeDurga Bhadra Naga temple Sacred grove, Near Thodupuzha, Kerala	Temple Authorities, SanthukadSreeDurgaBhadra Naga temple; Dept. of Zoology
3.	Farmer's day celebration in adopted village, Avoly	GramaPanchayat, Avoly; NSS Unit Nirmala College
4.	Organic farming- planted 80 plantain seedlings and sale of the organic produce	KrishiBhavan, Avoly; NSS Unit Nirmala College
5.	Exhibition on awareness about plastic: Reduce, Reuse and Recycle	NSS Unit Nirmala College
6.	SuchitwaBodhanaYajnam-Padayathra (Walkathon)	Rajagiri College of Social Sciences, Kalamassery; NSS Unit Nirmala College
7.	AnikaduWaterbody Conservation Project	Green People, an Environmental Organization, Residents Associations and Avoly GramaPanchayat; NSS Unit Nirmala College
8.	Paddy cultivation in 60 cents of land and sale of the organic produce.	KrishiBhavan, Avoly; NSS Unit Nirmala College

Routine Green Practices

- **World Environment Day – June 5**

Awareness seminars are organized on various environmental problems.

Planting trees, poster exhibition etc. are some activities on that day.

• **Ozone Day – September 16**

Invited lectures, Painting competitions

Activities of Nature club

The nature club conducts a number of programmes to promote love of nature among students and make them conscious of the various ways in which they can work effectively to preserve the ecosystem. The programmes include nature camps, environment education, wildlife surveys, mountaineering etc. As part of this club students are encouraged to plant saplings of rare and endangered plants to conserve biodiversity. Students are motivated to keep up the green cover maintenance by planting various medicinal, ornamental, spices and vegetable plants in the campus.

Suggestions to Improve Green Cover in the campus

- Bush gardens
- Terrace cultivation of vegetables
- Green corridors
- Canopy climbers through walkways
- Plantation of trees

d) Carbon Footprint

Transportation means of stakeholders

Stakeholders	Bus	Bike	Car	Autorikshaw	Cycle	pedestrians	Total
Staffs	74	38	58	9	-	22	201
Students	2069	170	7	-	1	455	2702
Visitors	24	3	nil	nil	-	4	31

- Number of persons using cycles – 1
- Number of persons using cars – 65
- Number of persons uses two wheelers – 208
- Number of persons uses autorikshaw – 9/day
- Number of persons using other transportations – 2620
- Number of visitors per day – 31
- Number of Students staying in the hostel – 410

- Number of Faculty and staff staying in the quarters – 10
- Auto charges for office transportation – 6000/month
- Average distance travelled by stake holders – 28 kms/day
- Expenditure for transportation per person per day – Rs.25/-

Suggestions to reduce carbon footprint

- (i) College observe " no own vehicle day" every month. The second Tuesday of every month is dedicated for it. Teachers and students are not allowed to take their private vehicles on that day and are supposed to reach college via public transportation methods. The no own vehicle day is widely accepted among students and teachers and is hugely appreciated by the community.
- (ii) College also promote car and bike pooling system. Teachers/ students coming from the same area share their vehicles to reach the college. This also reduces the number of private vehicles used in the college campus.

4.2 Evaluation of Audit Findings

Water

Water Audit at Nirmala College, Muvattupuzha					
1	2	3	4	5	6
Activity	Average use per activity (litres)	Number of activity /day	water use/ person / day (litres)	Number of persons using water	Total water consumption / day (litres)
<i>Washing hands and face</i>	1/2L	2 times a day	1L	1300	1300
Bath	10-30	once	20L	500	11000
Toilet flush	6-20	once	10L	2000	19400
Leaking/dripping tap (1 drop/ second /day)	30-60	continuous	21 taps		727
garden use	4	once			5000

Nirmala College, Muvattupuzha

Cooking (average)	3	once	3		5000
Hostel uses	All uses	Twice	410	2	33000
Lab uses	3	once	3L		12300
Construction work					5000
Total water use					92727 L/day

92727 liters of water is used per day by the college for its different uses. The main source of water is ground water. Water from the public water supply is not utilized. **727 L** of water is lost per day through the leaking of pipes and other misuse. This can be prevented. If water treatment system is installed at canteen and chemical laboratories the amount of water lost through outlets can be recycled and utilized for gardening and toilet uses. Awareness programs for the management of sustainable water use will be highly beneficial in this college.

Energy

Energy Utilization

Appliances	Number of appliance	Units of current per
Computers and laptops	327	3507.20
Air conditioners	25	1413.60
CFL bulbs	432	538.96
Photocopiers	6	142.56
LED lights	118	35.29
Incandescent bulbs	39	101.36
Fans	814	2618.99
Tube lights	656	729.20
Electrical Equipments	217	4519.00
Televisions	21	13.33
Inverters	60	591.63
Heaters	30	336.18
CCTV DVR	21	368.67
Water pumps	5	2941.00
Total Energy usage per month (kWh)		17856.97

The total energy utilization of the college for different purposes is approximately **17856.97 units/month**. Increased production of solar energy a type of non-conventional category of energy will be a good energy management system for

the college. Electricity charges per month are **Rs.100000/month**. Energy saving through the replacement of incandescent bulbs, CFL lamps and tube lights to LED light could be a good option. Energy efficient electrical equipments especially fans and pump sets can be replaced against old ones. Awareness programs for the stakeholders to save energy may also increase sustainability in the utilization of various energy source.

Waste

- ❖ Total Biodegradable waste = 115.5 kg/day
- ❖ Non-biodegradable waste = 4 ½ kg/day
- ❖ Hazardous wastes = 110 grams/day

The composting facility of the college for the treatment of biodegradable waste generated from the canteen, office, vegetable garden, and from the college campus cleaning operations is not adequate. Different methods such as pit composting, vermicomposting, bacterial composting using bacterial consortium may be used to treat the biodegradable waste. Bottles, plastics, cans, broken glass wares, tins etc., may be recycled or sold out. A model solid waste treatment system can be established in the college as a part of awareness program to the students.

Green Campus

Total campus area – 53 Acre (214483.05 m²)

Total number of plant species identified – 462

Tree cover of the campus – 96517 m²

Garden area inside the college – 4734.85 m²

Free space available in the campus – 82065 m²

Total area for cultivation:-

Veg. garden area - 50 cents

Medicinal plant garden – 5 cents

Spices garden – 20 Cents

Herbal garden – 25 Cents

Biodiversity garden – 10 Cent

The college has ample land surface for greening initiatives. The campus has 31 species of trees. A model arboretum will be ideal for the college. At least 50 different types of trees can be planted in the campus every year. Area demarcated for the establishment of a gardens of medicinal plants, paddy field and vegetable garden, may be extended.

Carbon Footprint

- Petrol used by two wheelers/day–**208 L**
(Per person to and fro 42 kms = 1L)
- Fuel used by four wheelers (65 Persons) - **130 L**
(Per person to and fro 42 kms = 2L)
- Fuel for persons (total 2620 persons) travelling by common transportation = **210 L** (4L x 50 persons)
- Persons travelling autorickshaw – 9 / day (Cost Rs. 450/day)
- Fuel used – 4 ½ L (½ /person)

Total fossil fuel use is 552 ½ L / day

Total fuel cost per day for transportation = Rs 36070/day

(548 L x Rs 65)

- Cost of Gas cylinders used Rs. 39000/month (60 cylinders)
- Cost of generator fuel – Rs. 750/day
- Amount spent for transportation (office) – Rs. 6000/month (Approx.)
- Amount spent for transportation (canteen) – Rs. 4000/month "
- Amount spent for transportation (visitors) – Rs. 15000/year
- Other expenditures for the fuel – Rs. 375/day

Burning of fossil fuels is the main source and cause of carbon dioxide release to the atmosphere. Carbon dioxide release for the stakeholders to reach the college is very high. It is contributing to the global warming and increasing the pace of climate change. If a College bus is plying for the staff and students carbon dioxide released for the stakeholders' commutation can be reduced.

More trees may be planted in the campus to make a source of sink for the carbon dioxide and other green house gases.

4.3 Consolidation of Audit Findings

We hope that students will have developed a greater appreciation and understanding of the impact of their actions on the environment. They have successfully been able to determine the impacts on the environment through the various auditing exercises. Participating in this green auditing procedure they have gained knowledge about the need of sustainability of the college campus. It will create awareness on the use of the Earth's resources in their home, college, local community and beyond.

Major Audit Observations

Approximately 95000L water is pumped to the overhead tanks from 5 wells with the help of 5 pumps (total 30 hp) every day. Frequency of water pumping will be more during the summer months. This may lead to ground water depletion and induce drought to the locality. Usage of water should be cut short and water management should be done for the replenishment of ground water resources. Power consumption in the college is high even though there is solar power generation at the rate of 3000 kWh/month. Cost of energy including electricity, fuel for generator, firewood etc is up to 171100/month. It is high time to go for more non conventional type of energy sources. College generates 115.5 kgs of biodegradable waste which is good for bio gas production. Composting using consortium of bacteria may also be used to manage waste in the campus. If different model plants of solid waste treatment are established in the college, which will be a source of informal education for students to practice the waste treatment at home there by a menace of the society can be partially controlled. College has 462 species of plants in the campus, but an inventory of all plants present with photographs are lacking. There is enough free space to plant fruit trees in the campus. It is high time to make an arboretum in the campus.

Carbon emission rate in the college is very high. 552.5 liters of fossil fuels are burned every day by the stakeholders for their transportation alone. 60 LPG cylinders are used in the college for different purposes. This is also contributing to the carbon footprint. College management should think loudly to reduce the carbon emission rate at the earliest.

- The environmental awareness initiatives are not substantial.
- The installation of solar panels, training in vegetable cultivation and composting practices are inadequate.
- There is no Green policy/ environmental policy statement indicating the commitment of the college towards its environmental performance.
- Gardens inside the college premises are found well maintained.
- Use of notice boards and signs are inadequate to reduce over exploitation of natural resources.
- Programs on green initiatives have to be increased. Campus is declared plastic free; stringent actions should be taken to maintain this.
- Rain water harvesting systems, solar power generation, and environmental education programs have to be strengthened.

Water Audit

- There is no water consumption monitoring system in the college campus.
- The college does not have waste water treatment for waste water generated from laboratories, canteen, hostel kitchen, toilets, bathrooms and office rooms.
- The waste water from laboratories, canteen and kitchens are not suitably controlled and are not used for gardening.
- The college has to take actions to strengthen rain water harvesting. Rain water harvesting for separate buildings are lacking. Measurement of quantity of water obtained from the rain water harvesting should be done.

- Automatic switching system is not installed for pump sets used for overhead tank filling.
- Per day use of water is very high and there is no control over wastage of water.
- Display boards against the misuse of water use are lacking.

Energy Audit

- The communication process for awareness in relation to energy conservation is found inadequate.
- Assessment of electrical load calculation is yet to be done by the college.
- Monthly use of electricity in the college is very high.
- Objectives for reducing energy, water and fuel consumption are meager.
- There are fans of older generation and non energy efficient which can be phased out by replacing with new energy efficient fans.
- Regular monitoring of equipments and immediate rectification of any problems.

Waste Management Audit

- Solid waste management systems established are insufficient.
- The college has proper communication with the local body for regular collection of solid waste from the campus.
- Implementation of sustainable projects to attain set environmental goals is not in place.
- Waste bins in the class rooms, veranda, canteen and campus are inadequate.
- Bio gas plant is not working.
- Proper composting systems are lacking.
- Green chemistry labs are not introduced.

Green Campus Audit

- Regular planting of trees in the campus are inadequate.
- Display boards to all plants identified are lacking.
- No arboretum is set up in the college campus.
- There is only very few fruit trees in the college to attract birds.
- Registry for flora and fauna on the campus is lacking.
- Uses of herbals cultivated in the medicinal plant garden are not displayed.

Carbon Foot Print Audit

- College has not yet taken any initiative for carbon accounting.
- Adequate common transportation facilities should be provided by the college.
- Encourage students to use cycles.
- **552.5** liters of fossil fuel is burned every day for the functioning of the college. This releases very high carbon emission.
- A huge amount such as **Rs. 36070** per day is spent as the cost of fossil fuel by the stakeholders.
- Usage of **60** gas cylinders per month is very high. Rs.1300 is spent for LPG every month. Stakeholders spent Rs 375/day for other expenses for the energy.

4.4 Preparation of Action Plan

Policies referring to college's management and approach's towards the use of resources need to be considered. The college should have a green policy/environmental policy for its sustainable development. The environmental policy formulated by the management of the college should be implemented meticulously. The college should have a policy on awareness raising or training programs (for ground staff or kitchen staff for example) and college also should have a procurement policy (the College's policy for purchasing materials).

Follow Up Action and Plans

Green Audits are exercises which generate considerable quantities of valuable management information. The time and effort and cost involved in this exercise is often considerable and in order to be able to justify this expenditure, it is important to ensure that the findings and recommendations of the audit are considered at the correct level within the organisation and that action plans and implementation programs result from the findings.

Audit follow up is part of the wider process of continuous improvement. Without follow-up, the audit becomes an isolated event which soon becomes forgotten in the pressures of organisational priorities and the passing of time.

4.5 Environmental Education

The following environmental education program may be implemented in the college before the next green auditing: -

- Training programs in solid waste management, liquid waste management, setting up of medicinal plant nursery, water management, vegetable cultivation, paddy cultivation, tree planting, energy management, landscape management, pollution monitoring methods, and rain water harvesting methods.
- Increase the number of display boards on environmental awareness such as – save water, save electricity, no wastage of food/water, no smoking, switch off light and fan after use, plastic free campus etc.
- Activate the environmental clubs
- Set up model rainwater harvesting system, rainwater pits, vegetable garden, medicinal plant garden, paddy fields etc. for providing proper training to the students.
- Conduct exhibition of recyclable waste products

- Implement chemical treatment system for waste water from the laboratories.

Awareness on Carbon Consumption

- Students and Staff members may be made aware of pollution caused by use of vehicles.
- The carbon consumption awareness programs on carbon emission at individual as well as social level will help to avoid air and noise pollution in the campus due to vehicles.

4.6 Conclusion and List of Recommendations

The green audit assists in the process of testing performance in the environmental arena and is fast becoming an indispensable aid to decision making in a college.

The green audit reports assist in the process of attaining an eco friendly approach to the sustainable development of the college. Hope that the results presented in the green auditing report will serve as a guide for educating the college community on the existing environment related practices and resource usage at the college as well as spawn new activities and innovative practices. A few recommendations are added to curb the menace of waste management using eco-friendly and scientific techniques. This may lead to the prosperous future in context of Green Campus and thus sustainable environment and community development.

It has been shown frequently that the practical suggestions, alternatives, and observations that have resulted from audits have added positive value to the audited organisation. An outside view, perspective and opinion often helps staff who have been too close to problems or methods to see the value of alternative approaches. A green audit report is a very powerful and valuable

communications tool to use when working with various stakeholders who need to be convinced that things are running smoothly and systems and procedures are coping with natural changes and modifications that occur.

Common Recommendations

- ❖ Adopt an environmental policy for the college
- ❖ Establish a purchase policy towards environmental friendly materials
- ❖ Introduce UGC Environmental Science course to all students
- ❖ Conduct more seminars and group discussions on environmental education
- ❖ Students and staff can be permitted to solve local environmental problems
- ❖ Renovation of cooking system in the canteen to save gas
- ❖ Establish water, waste and energy management systems

Criteria Wise Recommendations

Water Management

- Remove damaged taps and install sensitive taps is possible.
- Drip irrigation for gardens and vegetable cultivation can be initiated.
- Establish rain water harvesting systems for each building.
- Establish water treatment systems.
- Awareness programs on water conservation to be conducted.
- Install display boards to control over use of water.

Energy Management

- Employment of more solar panels and other renewable energy sources.
- Conduct more save energy awareness programs for students and staff.
- Replace computers and TVs with LED monitors.
- More energy efficient fans should be installed.
- Observe a power saving day every year.
- Automatic power switch off systems may be introduced.

Waste Management

- Establish a functional bio gas plant.
- A model solid waste treatment system to be established.
- Practice of waste segregation to be initiated.
- A model vormicomposting plant to be set up in the college campus.
- Establish a plastic free campus.
- Avoid paper plates and cups for all functions in the college.

Green Campus Management

- All trees in the campus should be named scientifically.
- Create more space for planting.
- Grow potted plants in both verandah and class rooms.
- Create automatic drip irrigation system during summer holidays.
- Not just celebrating environment day but making it a daily habit.
- Beautify the college building with indoor plants
- Provide funds to nature club for making campus more green
- Encourage students not just through words, but through action for making the campus green
- Conduct competitions among departments for making students more interested in making the campus green.

Carbon footprint

- Establish a system of car pooling among the staff to reduce the number of four wheelers coming to the college.
- Introduce college bus services to the students and staff.
- Encourage students and staff to use cycles.
- Establish a more efficient cooking system to save gas.
- Discourage the students using two wheelers for their commutation.
- More use of generators every day should be discouraged.

Chapter 5

Exit Meeting

The exit meeting was conducted by the lead auditor Dr. C.M. Joy. It was a mechanism to provide the management and staff a broad feedback on the preliminary findings of the audit team before completing the audited report. The exit meeting was held in the college on 25th April, 2017. Clarification on certain information gathered was sought by the audit team from the management and staff of the college.

Draft Audit Report

The information gathered by the audit team was consolidated as a draft audit report. This draft report was then circulated to the audit team and those directly concerned with the audit to check the report for accuracy. The draft green audit report was also discussed in the exit meeting.

Final Audit Report

The final audit report is the corrected final document which contains the findings and recommendations of the audit. It will also form one of the bases of future audits because the information it contains informs some of the tests and

analyses that need to be performed in the future. Final Audit Report was submitted on 22nd May, 2017 to the Principal of the college.

Follow Up and Action Plans

Green audits form a part of an on-going process. Innovative green initiatives have to be designed and implemented every year to make the college environmentally sustainable. Follow up programs of green auditing recommendations should be done meticulously before the next audit.

Next Audit


In order to promote continuous improvement it is recommended to conduct the next green auditing during the year 2019.

Transparency of Green Audit Report

Green audit report is one of the useful means of demonstrating an organisation's commitment to openness and transparency. If an organisation believes it has nothing to hide from its stakeholders, then it should feel confident enough to make its green audit reports freely available to those who request them. As a basic rule, green audit reports should be made available to all stakeholders.

Acknowledgements:-

CMJ Eco Associates are thankful to the Management and the Principal of the Nirmala College, Muvattupuzha for entrusting processes of Green auditing with us. We thank all the participants of the auditing team especially students, faculty and non-teaching staff who took pain along with us to gather data through survey. We also thank the office staff who helped us during the document verification.


PRINCIPAL
NIRMALA COLLEGE
MUVATTUPUZHA





Carbon Footprint Audit



Green Campus Audit



Waste Audit



Energy Audit



Water Audit



Mushroom Cultivation



NIRMALA COLLEGE MUVATTUPUZHA



GREEN AUDITING

2018-19

Audited by
Heartian Green Audit Team Sacred Heart College Thevara, Cochin-13

Contents

1. Introduction

- 1.1. Green Audit
- 1.2. General Steps involved in green audit

2. Nirmala College – A Historical Account

- 2.1. Brief History
- 2.2. Geography
- 2.3. General Information
- 2.4. Previous Green Audit
- 2.5. Role of Management in Green Management
- 2.6. Swachh Nirmala

3. Audit Preparations

- 3.1. Management
- 3.2. Teaching and Non-teaching staff
- 3.3. Students
- 3.4. The Green Audit Process
- 3.5. Onsite Audit Activities

4. Green Audit

- 4.1. Inspection
- 4.2. Questionnaire
- 4.3. Evaluation of documents and reports
- 4.4. Findings and Analysis
 - 4.4.1. Analysis of Green Practices
 - 4.4.2. Analysis of Water Management
 - 4.4.3. Analysis of Energy Management
 - 4.4.4. Carbon Footprint Audit

5. Recommendations

6. Future action plans

Acknowledgements

Plates and Annexures

GREEN AUDIT 2018-19 NIRMALA COLLEGE

EXECUTIVE SUMMARY

Nirmala College, Muvattupuzha established by the Catholic diocese of Kothamangalam in 1953, is situated in a sprawling 50 acrd green campus on the mid-land hilly terrain in Avoly Panchayat of Ernakulam district, about 2 kms away from Muvattupuzha town. The college in its fourth cycle of re-accreditation by NAAC has undergone a green audit for a second time (within a span of 3 years) in its progress towards the goal Swachch Nirmala. It has 2730 students, 143 faculty members and 52 non-teacing staff. The audit was undertaken by Heartian Green Audit Team of Sacred Heart College, which had an interdisciplinary composition of experts in various aspects of environment.

The audit period was between December 1, 2018 and Jan. 26th 2019. The audit team verified the documentation on green practices related to bio-diversity, energy management, water resource management, waste management, carbon footprint, agriculture, sustainability aspects, cleanliness etc. which had been prepared through participatory processes within the college.

The audit observed the following:

Sustainable improvement in the efforts by the college on the green front

Compliance efforts regarding suggestions of the previous audit

Involvement of all stakeholders, viz., college management, administration, faculty, student, alumni, etc.

1. Consistent improvement in physical facilities
2. Importance given to biodiversity and farming practices. More than 300 flowering plant species found on the campus is a good sign.

1. Elaborate audit process involving different stakeholders itself works out to be an educative programme for the campus community.
2. The activities effort towards *Swachh Bharath*, efforts at organic farming, conservation of water resources, clean campus, and conservation of biodiversity are to be appreciated.

The audit pose some suggestions and future action plans to be implemented in the campus including:

1. Articulation of comprehensive environment policy.
2. Effort to enhance solar energy trapping systems, with specific achievable target, and a time bound plan for converting non-LED bulbs to LED bulbs.
3. A comprehensive and specific environment education plan including the practices available in the campus to be given to all students in the campus.
4. Setting time bound targets for water treatment, especially from the labs.
5. Greater stress on documentation of bio-diversity and their periodical updation, with specific reference to avian and lepidopteran fauna with respect to their respective seasonality.
6. Annual internal audit to be conducted

We hope this audit will provide a solid platform to identify strengths and weakness of green management in Nirmala College Campus and the College team would take it further.

Heartian Audit Team

28-03-2019

Thevara



Green Audit – Nirmala College Muvattupuzha
CERTIFICATE

This is to certify that the Green Audit Report of Nirmala College is based on the original data collected during the period of study. Further, it is certified that the baseline data was prepared by the internal Green Audit team of Nirmala College, Muvattupuzha and submitted to us. The content of the baseline data of the study has been personally verified by the Green Audit Team for validity and reliability. The data used in the study are original in nature and have not been presented or published elsewhere. Photographs used in the report are either taken directly by the audit team or are given by the internal audit team.

Heartian Green Audit Team

1. Fr. Prasanth Palackappillil (Principal and Convener)

2. Dr. Giby Kuriakose (Coordinator)

3. Dr. Mathew George (Energy Management Expert)

4. Dr. Midhun Dominic (Water Management Expert)

28-03-2019

Thevara

Chapter – 1

Introduction

1.1. Green Audit

The Green audit process was began in the 1970s with an intention of identifying the activities carried out in a given institution or company. This was initiated against the background of growing concern over changing climate and related aspects. Green audit is a tool to identify the range of environmental impacts and assess the compliance of the operations on the development and regular activities within an organisation. It may also assess the compatibility of the operations within an organisation or a company with existing applicable laws and regulations and the expectations of their various stakeholders. It further assesses the possible implications and effect of pollution due to the operations within the organisation. The audit also seeks to identify possible means and methods to save investments, enhance work quality, improve health and safety of their employees, reduce liabilities and reduce the rate of environmental pollution. A continuous process of such audit might result in maintaining the quality of these aspects within the premises of any organisation.

Most companies, government and non-government bodies and other institutions conduct green audit aiming:

- to ensure that the performance of the institution with respect to environmental activities they are involved in, is in compliance with existing laws and regulations.
- To check the functionality and their operating success including water supply, energy related matters and other similar matters that are related to green operations in the campus
- To formulate or update the institution's environmental policy, if warranted.
- To measure the environmental impact of operational process related to green activities in the campus.
- To measure the performance of each green related operations and actions in the campus.

- To generate a database of green activities for continuous monitoring to assess the success of each of them.
- to identify future potential liabilities.
- to align the institution's developmental and day to day activities with the stated vision, mission, strategies, etc.
- to identify possible ways to reduce expenditure and running costs on equipments, appliances, etc. or try enhance revenue income.
- to improve process and materials efficiency, and in response to stakeholder requests for increased disclosure.

The process of green audit based on operational activities within an institution happens not necessarily based on laws and regulations. It might be largely based on awareness and concerns on environmental performances within and outside the institute's premises. This further strengthens the fact regarding social responsibilities of the organisation. Majority of the institutions that conducted green audits in the recent past has realised the importance of the same as they could easily manage their operational costs and provide good atmosphere to their stakeholders. The green audit also provides opportunities to identify full range of operations within an organisation, the impacts of maintaining and functioning of its operational goods and services, the actual source of raw materials for different activities within the organisation, the costs of operations of its offices, functional units, and other facilities. It also provide chances to understand the relationship with employees, material suppliers, stakeholders, etc. The recommendations, findings and suggestions that emerge during green audit would certainly help the management of the organisation to set up future action plan that best suits to them.

1.2. General steps involved in Green Audit

1. Systematic and exhaustive data collection.
2. Evidence based documentation of activities.
3. Regular monitoring.
4. Provide standards and methods for improvement by establishing cost effective green action plan.

Chapter – 2

Nirmala College – A Historical Account

2.1. Brief History

Nirmala College, Muvattupuzha is one among the leading higher education institutions in Kerala. It has completed 65 years of academic mission. The college was established in the year 1954 under the Syro-Malabar Catholic Church management of Kothamangalam Diocese. The college offers undergraduate and post-graduate degrees in the arts, science and commerce streams. Situated in a hilly region surrounded by agricultural farm lands it adopts a healthy culture of keeping traditional as well as modern green practices. The campus is surrounded by heterogeneous vegetation with a fair amount of shady trees naturally found in the locality. The Campus is situated two km away from the Muvattupuzha Township. The campus provides an apt academic ambience free from the hustle and bustle of the town.

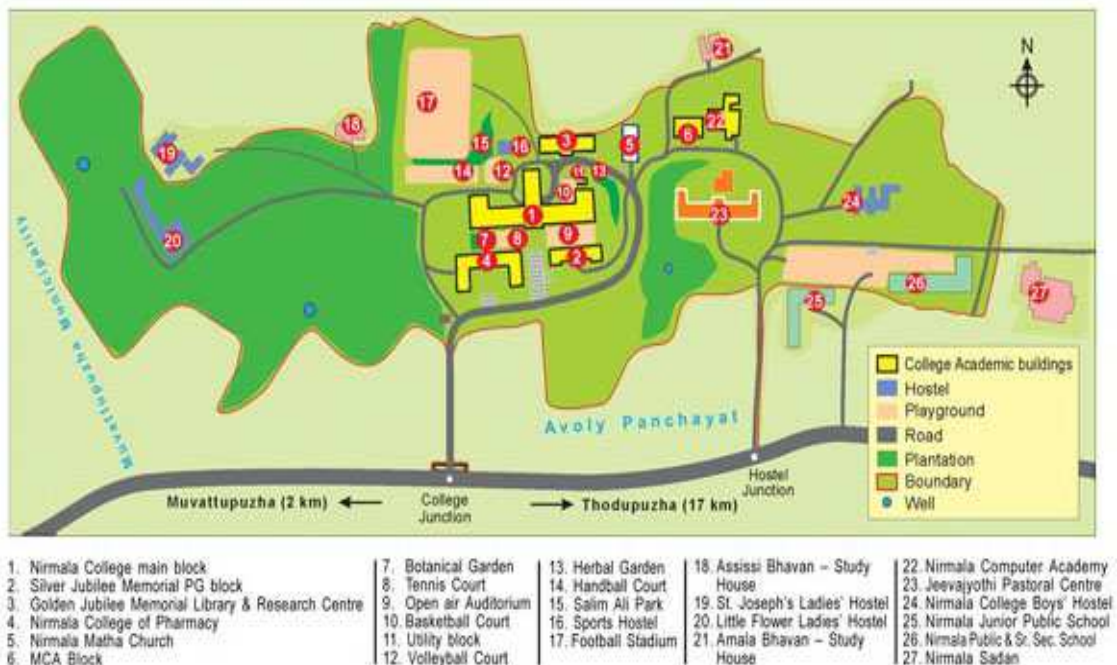


Figure – 1. Campus infrastructure illustrates the facilities and their respective places

2.2. Geography

The College is situated in Avoly Panchayat of Muvattupuzha Taluk in Ernakulam district. Its locational coordinates are 9°58'38.14"N 76°35'46.81"E. The locality comes under the midland region of Kerala, which has the geographical features of undulated land areas tapering into paddy fields. The raised part of the region provides conducive conditions for the growth of tropical evergreen and deciduous varieties of fruit yielding and other trees.

2.3. General Information

The college offers 17 UG programmes and 14 PG programmes. Seven departments are recognised as research centres. The college has almost 2730 students on its rolls in various programmes with girls forming almost 60%. There are 65 teaching staff in the aided stream in various disciplines. Of which, 36 staff members hold PhD. Further, the college has 68 teachers on ad-hoc basis. More than 64% of the members of different faculties are women. About 52 administrative staff members and supporting staff are working in the college office and different departments. The college is tapping various funding sources from different National and State funding agencies such as University Grants Commission (UGC), Department of Science and Technology (DST), Department of Bio-technology (DBT) and Kerala State Council for Science, Technology and Environment (KSCSTE) for different academic activities including research.

Science departments are supported with DST-FIST. The College gained 'Star College' status (2017-2020) by the Department of Biotechnology, (India). Several major and minor research projects are being carried out by different staff members. Quality publications over a period in reputed national and international journals with high impact factor and h-index.

The college is adopting information technology as per the requirements. It also implement advance learning practices and system with utmost care. Digital Library with over 65000 titles of various disciplines, UGC sponsored INFLIBNET, etc. are

some examples for the same. The college publishes a bi-annual journal called “Science and Society” with ISSN number since 2003. Several endowment lectures inter-disciplinary national seminars and invited talks by experts are some dedications the college shown towards academic excellence.

Various clubs and fora such as National Service Scheme (NSS), National Cadet Corps (NCC), Debate Club, Quiz Club, Catholic Students Movement (CSM), Entrepreneurship Development Club (EDC), Human Rights Club (HRC), Anti-Narcotic Club (ANC), Road Safety Club, Nature Club, etc. are actively involved in the development of student capacity and personality.

The college apparently has a proven track record of its social commitment. The staff, students and managements are trying to reach out to the public and educating them on topics of common interest. Also, the college authorities, using public addressing system or programs such as ‘Nirmala Radio’ and ‘Zero Hour’ provides ample opportunity to the students to experience extra-curricular aspects.

Different department celebrations, inter-departmental and inter-collegiate competitions, and other celebrations helps the students to perform and sharpen their talents. All UGC, state government and university norms and directions are practiced without fail in the campus. This enables the students to develop their life with multifaceted and systematic activities. Parent Teacher Association (PTA) and Alumni Association play a good role in between the on campus students and society.

There are five air conditioned and well-furnished conference halls, four auditoriums of ample space, six seminar halls belonging to different departments, five computer labs, three smart class rooms, one language lab, about 250 computers with internet access, six photocopying machines, 22 DLP Projectors and so on. Two Ladies’ Hostels, Boys Hostel, Sports Hostel, Cafeteria, Post-office, Bank, Two ATM Counters, Kiosks, Staff Co-operative Society, Electronic workshop, Gymnasium,

Yoga Centre, Chapel, Counselling Centre, Book Stall and Stationery Shop are the strength and diversity of the infrastructure of the campus. This indicates that the campus is aligning its resources with advancement in the world of technology and development. This is very much in line with the vision of the college.

A dedicated and well equipped IQAC cell controls the activities that enables the campus to run along the forerunners of academic institutes in Kerala. The IQAC is well connected with the college management, administrative office, different departments, clubs and fora, etc. It also act as a mediator in organising several activities in the campus. Systematic documentation of activities and academics is a characteristic feature of the college. The IQAC cell enables the campus to get accreditations from different accrediting agencies.

2.4. Previous Green Audit

The previous green audit of Nirmala College Muvattupuzha was done during April-May 2017 by CMJ Eco Associates, Kochi. The report of the green audit was a comprehensive evaluation after thorough evaluation of all aspects related to concerned green activities of the campus. It identified the green activities in the campus involving, management, teachers and students. It also identified lacunas in green practices of the campus and recommended a few practices to be implemented for it to become a green campus. The following were the common recommendations posted in the previous audit.

- Adopt an environmental policy for the college.
- Establish a purchase policy towards environmental friendly materials.
- Introduce UGC Environmental Science course to all students.
- Conduct more seminars and group discussions on environmental education
- Students and staff can be permitted to solve local environmental problems.
- Renovation of cooking system in the canteen to save gas.
- Establish water, waste and energy management systems.(see Green Auditing of Nirmala College, 2017).

The college has apparently tried their level best to implement these recommendations within the stipulated time period. It also adopted other policies and practices that help them to achieve a green campus. The previous audit also suggested criteria wise recommendations such as water management and energy management. Most of the recommendations were dealt with by the campus authority.

2.5. Role of Management in Green Management

The part played by the college management in bringing the campus to a green one is adorable.

The following were the initiatives by the college authorities in green management:

1. The management developed separate teams for implementing green policy in the campus.
2. Regular evaluation system has been established with monitoring cells for green activities in the campus.
3. The management has allotted budget for implementing green policies in the campus.
4. The green monitoring cell evaluates developmental and functional activities and makes recommendations for improvement of the green aspects.
5. These recommendations are implemented without delay and fail.
6. Clubs that are related to green activities are encouraged to conduct programs in and around the campus.
7. The management is keen on the social commitments and tries to reachout to the general public through teachers and students.
8. The management is keen in conducting awareness programs based on its green policies.
9. The support and part played by management is vital in the green campus related activities.

2.6. Swachh Nirmala

Swachh Nirmala, “*Green Nirmala, Clean Nirmala*” is a novel initiative of the entire campus community to institutionalise cleanliness as an integral part of its functioning. The steps taken by the management to achieve this has fulfilled when Nirmala College listed in the MHRD, India Swachhatha Campus ranking twice. Mainly the college aim to achieve the following objectives by implementing Swachh Campus:

- To support the *Swachhta* movement in the country.
- To contribute positively to the environmental consistency.
- To campaign for good health, well-being, clean water, sanitation and clean energy.
- To monitor the environmental performance of the college.
- To formulate and implement a green protocol for students, faculty and campus level.

Chapter – 3

Audit Preparations

3.1. Management

The Nirmala College management was very keen in taking up the recommendation of conducting a green audit after two years after the previous audit. In the light of this, the college management approached Sacred Heart College, which has a consultancy wing offering services like green audit of institutions. The **Heartian Green Audit Team** agreed to conduct the green audit of Nirmala College. After this, there was a preliminary visit to the campus to set up different criteria and questions that are necessary for an updated green audit.

The following were different criteria set forth for the present green audit.

- a) Green Practices
- b) Water Management
- c) Energy Management
- d) Carbon Footprint

A detailed questionnaire for each aforementioned criteria was prepared based on the campus visit and thorough evaluation of the previous audit. The audit team in discussion with the college green cell has identified a team including teachers, non-teaching staff and students. The team has collected information that is addressed in the questionnaire.

3.2. Teaching Staff and Students

The following table illustrate the details of internal audit team involved at various levels of this audit process;

Sl No	Name	Designation	Part Played	Audit Involved
1	Dr Gigi K Joseph	Assistant professor, Zoology	Coordinator	Water
2	Albert Kattakayam	1St Msc Zoology	Data Collection	Water
3	Jithu Jacob Lal	1St Msc Zoology	Data Collection	Water
4	Ameena K A	1St Msc Zoology	Data Collection	Water
5	Suhaila P Bavu	1St Msc Zoology	Data Collection	Water
6	Noorasma	1St Msc Zoology	Data Compilation	Water
7	Anand K S	1St Msc Zoology	Data Compilation	Water
8	Dr George James T	Associate Professor, Physics	Coordinator	
9	Anju M S	2Nd Bsc Physics	Data Collection	Energy
10	Rugma Raveendran	2Nd Bsc Physics	Data Collection	Energy
11	Thertha .S	3Rd Bsc Physics	Data Collection	Energy
12	Gissmol Saji	2Nd Bsc Physics	Data Collection	Energy
13	Albin Saju	2Nd Bsc Physics	Data Collection	Energy
14	Amlin Ann Jose	2Nd Bsc Physics	Data Collection	Energy
15	Aadish Kumar	2Nd Bsc Physics	Data Collection	Energy
16	Alwin Saju	2Nd Bsc Physics	Data Collection	Energy
17	Athulya M S	2Nd Bsc Physics	Data Collection	Energy
18	Malavika Manoj	2Nd Bsc Physics	Data Collection	Energy
19	Chithira K Vijay	2Nd Bsc Physics	Data Collection	Energy
20	Ansu Benny	2Nd Bsc Physics	Data Collection	Energy
21	Manjima Jijo	2Nd Bsc Physics	Data Compilation	Energy
22	Anuja Rose	3Rd Bsc Physics	Data Compilation	Energy
23	Ashitha Thankachan	3Rd Bsc Physics	Data Compilation	Energy
24	Aadish Kumar	2Nd Bsc Physics	Data Collection	Carbon Audit
25	Alwin Saju	2Nd Bsc Physics	Data Collection	Carbon Audit
26	Athulya M S	2Nd Bsc Physics	Data Collection	Carbon Audit
27	Malavika Manoj	2Nd Bsc Physics	Data Compilation	Carbon Audit
28	Chithira K Vijay	2Nd Bsc Physics	Data Compilation	Carbon Audit
29	Dr. N Shibin Mohanan	Assistant Professor, Botany	Coordinator	Green Audit
30	Dr.Sibi C Varghese	Assistant Professor In Contract, Botany	Coordinator	Green Audit
31	Merin Jose	3Rd Botany	Data Collection and Compilation	Green Audit
32	Muhammed Shahinkhan	3Rd Botany	Data Collection and Compilation	Green Audit
33	Aleena Johnson	3Rd Botany	Data Collection	Green Audit
34	Krishna Venu	3Rd Botany	Data Collection	Green Audit
35	Amalendu S	3Rd Botany	Data Collection	Green Audit
36	Anaswara Sasi	3Rd Botany	Data Collection	Green Audit
37	Geena Johnny	3Rd Botany	Data Collection	Green Audit
38	Bhagya M Nair	3Rd Botany	Data Collection	Green Audit
39	Divya Dinesan	3Rd Botany	Data Compilation	Green Audit
40	Abhiraj M N	3Rd Botany	Data Collection	Green Audit
41	Don Jose	2Nd Botany	Data Collection	Green Audit
42	Shibin Varghese	1St Bsc Botany	Data Collection	Green Audit

3.3. The Green Audit Process:

1. Selection of area/activities/parts of the campus.
2. Planning of visit to campus to discuss about the audit process.
3. Scope of audit process was identified in consultation with the auditee.
4. A meticulous plan of action was designed.
5. A team consisting of teachers, non-teaching staff and students was constituted with specific tasks and a proper time schedule.
6. Data pertaining to identified parameters for green auditing of the campus were collected directly through an on-site visit.
7. Available background information on the identified activities and other parameters were collected.
8. The role of each stakeholder in green related activities has been collected.
9. Historical aspects of green activities in the campus including flora fauna, water usage and waste generation, etc. were collected.
10. A questionnaire based on the preliminary visits and other evaluations was communicated to the authorities who are involved in the in house data collection.
11. Data collection based on questionnaire.
12. Visit to the campus by audit team.
13. Data analysis and evaluation.
14. Discussion on the findings.
15. Report preparation.

3.4. Onsite audit activities

1. The preliminary visit and meeting with the campus authorities was the first step between the audit team and auditee.
2. Site inspection for determining parameters for audit.
3. Site visit and evaluation of collected information of the audit team.
4. Meeting with the Principal, IQAC coordinator, teachers, non-teaching staff and students.
5. Meeting with the in house audit team for evaluation and clarifications.

Chapter – 4

Green Audit

4.1. Inspection

The preliminary visit in connection with the pre-audit process to the campus had identified criteria for audit, parameters to be evaluated and time schedule of green audit of Nirmala College. It included meeting with the Principal, IQAC coordinator, teachers in charge of different green activities of the campus and students representing different departments, clubs and fora. This enabled the auditing to gather all necessary preliminary information that is useful in preparing pre auditing questionnaire and data sheets. The on-site audit team collected information based on questionnaire and data sheet.

4.2. Questionnaire

The detailed questionnaire (Annexure I, II III & IV) was handled by three different audit teams and information was gathered. Information pertaining to green activities, water management, energy management and carbon foot print was analysed under different titles and sub-titles. This was based on the parameters identified. The questionnaire was comprehensive covering qualitative and quantitative dimensions.

4.3. Evaluation of documents and reports

The audit visit to the campus evaluated documents and reports (departments, clubs and fora) that are necessary for the audit process. This further strengthened the claims made by the campus authority on green operations in the campus. To generate future action plan, the audit team had a detailed discussion with different in house team in the institute and a concluding discussion session with IQAC coordinator and Bursar was done to finalise the plans.

4.4. Findings and Analysis

4.4.1. Analysis of Green Practices

4.4.1.1. Gardens

Nirmala College is situated in a peri-urban area where farming and agriculture are still being practiced in and around the campus. The campus biodiversity (Table-1) is an example of how they have imbibed the local practices and culture in preserving local biodiversity within the campus. The college management and authorities who are responsible for greening the campus is aptly adopting methods to preserve local flora and fauna. The botanical garden and different concept based gardens (spice garden, star plants garden, medicinal plants garden, *Dasapushpam* garden, ayurvedic preparation based plants (eg. *Nalpamara*, *thriphala*, etc.), are ideal for academic practices and learning while practicing.

Table – I. Campus Flora		
Sl. No.	Name of plants	No. of plants
1	<i>Abelmoschus esculentus</i>	50
2	<i>Acacia mangium</i>	10
3	<i>Acacia caesia</i>	5
4	<i>Acalypha wilkesiana</i>	5
5	<i>Achras sapota</i>	3
6	<i>Acorus calamus</i>	2
7	<i>Adenantha pavonina</i>	5
8	<i>Adhatoda vasica</i>	5
9	<i>Agave sp.</i>	5
10	<i>Aglaonema sp.</i>	10
11	<i>Agrostistachys indica</i>	1

12	<i>Ailanthus excelsa</i>	5
13	<i>Albizia chinensis</i>	5
14	<i>Aleurites moluccana</i>	2
15	<i>Allamanda cathartica</i>	55
16	<i>Aloe vera</i>	5
17	<i>Alpinia galanga</i>	5
18	<i>Alpinia nutan</i>	5
19	<i>Alstonia scholaris</i>	3
20	<i>Alternanthera brasiliana</i>	40
21	<i>Amorphophallus paeoniifolius</i>	10
22	<i>Anacardium occidentale</i>	5
23	<i>Ananas comosus (Pineapple)</i>	100
24	<i>Annona muricata</i>	1
25	<i>Anthocephalus cadamba</i>	2
26	<i>Anthurium species</i>	20
27	<i>Antidesma acidum</i>	3
28	<i>Antigonon leptopus</i>	2
29	<i>Aphanamixis polystachya</i>	1
30	<i>Aporosa lindleyana</i>	1
31	<i>Arachis pintoi</i>	500
32	<i>Aralia sp.</i>	10
33	<i>Areca catechu</i>	46

34	<i>Areca palma</i>	10
35	<i>Aristolochia indica</i>	5
36	<i>Artabotrys hexapetalus</i>	1
37	<i>Artabotrys odoratissimus</i>	1
38	<i>Artocarpus heterophyllus</i>	30
39	<i>Artocarpus hirsuta</i>	125
40	<i>Artocarpus integrifolia</i>	10
41	<i>Asparagus racemosus</i>	2
42	<i>Azadirachta indica</i>	2
43	<i>Bacopa monnieri</i>	50
44	<i>Baliospermum montanum</i>	2
45	<i>Bambusa glaucophylla</i>	2
46	<i>Bambusa sp.</i>	2
47	<i>Bauhinia variegata</i>	2
48	<i>Bauhinia acuminata</i>	2
49	<i>Bauhinia tomentosa</i>	1
50	<i>Begonia sp.</i>	10
51	<i>Bignonia sp.</i>	2
52	<i>Blumea mollis</i>	10
53	<i>Bombax malabaricum</i>	
54	<i>Bougainvillea sp.</i>	50
55	<i>Brassica oleracea</i>	25

56	<i>Bridelia retusa</i>	2
57	<i>Brunfelsia calycinae</i>	1
58	<i>Cactus sp.</i>	2
59	<i>Caesalpinia coronaria- divi-divi</i>	2
60	<i>Caesalpinia pulcherrima</i>	3
61	<i>Calliandra rheedii</i>	2
62	<i>Callistemon lanceolatus</i>	1
63	<i>Calophyllum inophyllum- Punna</i>	1
64	<i>Cananga odorata</i>	2
65	<i>Canarium strictum</i>	1
66	<i>Canna indica</i>	15
67	<i>Capsicum annum</i>	10
68	<i>Capsicum frutescens</i>	15
69	<i>Carallia brachiata</i>	1
70	<i>Carica papaya</i>	15
71	<i>Cascabela thevetia</i>	1
72	<i>Cassia fistula</i>	13
73	<i>Casuarina equisetifolia</i>	5
74	<i>Centella asiatica</i>	28
75	<i>Chrysanthemum sp.</i>	5
76	<i>Chrysophyllum cainito</i>	2
77	<i>Cinnamomum verum –Lauraceae- Edana</i>	2

78	<i>Cinnamomum zeylanicum</i>	1
79	<i>Cissus quadrangularis</i>	1
80	<i>Citharexylum spinosum</i> - Parijatham	1
81	<i>Citrus limon</i>	3
82	<i>Clematis elliptica</i>	2
83	<i>Clerodendrum thomsoniae</i>	10
84	<i>Clitoria ternatea</i>	2
85	<i>Coccinia grandis</i>	2
86	<i>Cocos nucifera</i>	360
87	<i>Codiaeum variegatum</i>	2
88	<i>Coffea arabica</i>	150
89	<i>Coleus aromaticus</i>	5
90	<i>Colocasia esculenta</i>	25
91	<i>Coriandrum sativum</i>	5
92	<i>Costus pictus</i>	5
93	<i>Couroupita guianensis</i>	1
94	<i>Crossandra infundibuliformis</i>	1
95	<i>Croton sp.</i>	25
96	<i>Cuphea minuta</i>	10
97	<i>Curcuma longa</i>	2
98	<i>Cuscuta reflexa</i>	2
99	<i>Cycas circinalis</i>	1

100	<i>Cycas revoluta</i>	1
101	<i>Cymbopogon citratus</i>	2
102	<i>Cyrtostachys renda- Red palm</i>	5
103	<i>Dalbergia latifolia</i>	1
104	<i>Dalbergia sissoo</i>	1
105	<i>Datura metel</i>	1
106	<i>Delonix regia</i>	1
107	<i>Derris trifoliata</i>	1
108	<i>Dieffenbachia sanguine</i>	15
109	<i>Dillenia bracteolate</i>	1
110	<i>Dillenia indica</i>	1
111	<i>Dioscorea esculenta</i>	5
112	<i>Diospyros blancoi- velvet apple</i>	1
113	<i>Diospyros peregrine</i>	1
114	<i>Dracaena braunii</i>	5
115	<i>Dracaena fragrans</i>	2
116	<i>Dracaena sp.</i>	5
117	<i>Duranta plumieri</i>	2
118	<i>Duranta repens</i>	2
119	<i>Elettaria cardamomum</i>	10
120	<i>Emblicaofficinalis</i>	2
121	<i>Ervatamia coronaria</i>	1

122	<i>Erythrina indica</i>	1
123	<i>Erythroxyllum monogynum-</i>	
124	<i>Eugenia jambos</i>	3
125	<i>Euodia lunu-ankenda</i>	1
126	<i>Euphorbia hirta</i>	50
127	<i>Euphorbia rothieri</i>	5
128	<i>Euphorbia sp.</i>	5
129	<i>Evodia lunu ankenda</i>	2
130	<i>Evodia roxburghiana</i>	1
131	<i>Excoecaria bicolor-</i>	1
132	<i>Filicium decipiens</i>	1
133	<i>Ficus asperrima</i>	2
134	<i>Ficus auriculata</i>	1
135	<i>Ficus bengalensis</i>	2
136	<i>Ficus benjamina</i>	1
137	<i>Ficus elastica</i>	4
138	<i>Ficus hispida</i>	10
139	<i>Ficus racemosa</i>	1
140	<i>Ficus religiosa</i>	2
141	<i>Filicium decipiens</i>	1
142	<i>Flacourtia montana</i>	1
143	<i>Garcinia gummi-gutta</i>	2

144	<i>Garcinia mangostana</i>	1
145	<i>Gardenia gummifera</i>	3
146	<i>Gardenia jasminoides</i>	5
147	<i>Gliricidia maculata</i>	1
148	<i>Glycosmis pentaphylla</i>	5
149	<i>Hamelia patens</i>	1
150	<i>Helicteres isora</i>	2
151	<i>Hevea brasiliensis</i>	200
152	<i>Hibiscus rosa-sinensis</i>	15
153	<i>Holmskioldia sanguinea</i>	1
154	<i>Holoptelea integrifolia</i>	2
155	<i>Holarrhena antidysenterica</i>	1
156	<i>Hopea parviflora</i>	2
157	<i>Humboldtia brunonis</i>	1
158	<i>Hylocereus undatus</i>	1
159	<i>Hypoestes phyllostachya</i>	1
160	<i>Impatiens balsamina</i>	10
161	<i>Indigofera sp.</i>	1
162	<i>Ixora chinensis</i>	5
163	<i>Ixora coccinea</i>	5
164	<i>Ixora philippinensis</i>	2
165	<i>Jasminum angustifolium</i>	1

166	<i>Jasminum grandiflorum</i>	5
167	<i>Jasminum rigidum</i>	2
168	<i>Justicia beddomei</i>	25
169	<i>Justicia gendarussa</i>	15
170	<i>Kaempferia galangal</i>	2
171	<i>Kleinhovia hospita</i>	2
172	<i>Kopsia fruticosa</i>	1
173	<i>Lagerstroemia flos reginae</i>	2
174	<i>Lagerstroemia microcarpa</i>	1
175	<i>Lannea coromandelica</i>	1
176	<i>Lantana camara</i>	25
177	<i>Lawsonia inermis</i>	2
178	<i>Lepisanthes tetraphylla</i>	1
179	<i>Lycopersicum esculentum</i>	25
180	<i>Macaranga peltata</i>	1
181	<i>Madhuca neriifolia</i>	1
182	<i>Mangifera indica</i>	40
183	<i>Manihot esculenta</i>	25
184	<i>Manilkara zapota</i>	2
185	<i>Marsilea quadrifolia</i>	5
186	<i>Meiogyne pannosa</i>	2
187	<i>Melastoma malabathricum</i>	10

188	<i>Mentha piperita</i>	2
189	<i>Mesua thwaitesii</i>	1
190	<i>Michelia champaca</i>	2
191	<i>Millingtonia hortensis</i>	2
192	<i>Mimusops elengi</i>	31
193	<i>Momordica charantia</i>	2
194	<i>Moringa oleifera</i>	5
195	<i>Morua alba</i>	5
196	<i>Murraya exotica</i>	5
197	<i>Murraya koenigii</i>	2
198	<i>Musa paradisiaca</i>	200
199	<i>Mussaenda erythrophylla</i>	5
200	<i>Mussaenda frondosa</i>	2
201	<i>Myristica fragrans</i>	12
202	<i>Naregamia alata</i>	5
203	<i>Nelumbium speciosum</i>	2
204	<i>Nephelium lappaceum</i>	11
205	<i>Nephelium lappaceum</i>	2
206	<i>Nerium indicum</i>	10
207	<i>Nymphaea pubescens</i>	5
208	<i>Ochna obtusata</i>	4
209	<i>Ocimum basilicum</i>	10

210	<i>Olea dioica</i>	6
211	<i>Olea dioica</i> - Karivetti	1
212	<i>Oroxylum indicum</i>	2
213	<i>Ocimum sanctum</i>	10
214	<i>Osmoxylon lineare</i>	10
215	<i>Oxalis purpurea</i>	50
216	<i>Pachystachys lutea</i>	5
217	<i>Palm sp.</i>	2
218	<i>Pandanus odoratissimus</i>	2
219	<i>Passiflora miniata</i>	2
220	<i>Passiflora sp</i>	5
221	<i>Pedilanthus tithymaloides</i>	10
222	<i>Peltophorum ferrugineum</i>	35
223	<i>Peltophorum pterocarpum</i>	10
224	<i>Peltophorum roxburghii</i>	10
225	<i>Phaseolus vulgaris</i>	5
226	<i>Pholidota imbricata</i>	1
227	<i>Pimenta dioica</i>	2
228	<i>Piper longum</i>	5
229	<i>Piper nigrum</i>	5
230	<i>Pithecellobium saman</i>	2
231	<i>Plinia cauliflora</i>	1

232	<i>Plumbago indica</i>	5
233	<i>Plumbago zeylanica</i>	2
234	<i>Plumeria acutifolia</i>	4
235	<i>Plumeria indica</i>	5
236	<i>Poeciloneuron indicum</i>	1
237	<i>Poinsettia pulcherrima</i>	2
238	<i>Polyalthia longifolia</i>	5
239	<i>Poncirus trifoliata</i>	2
240	<i>Pongamia glabra</i>	5
241	<i>Pongamia pinnata</i>	2
242	<i>Pouteria campechiana</i>	1
243	<i>Psidium guajava</i>	15
244	<i>Punica granatum</i>	1
245	<i>Quisqualis indica</i>	2
246	<i>Rauvolfia serpentina</i>	2
247	<i>Rhoeo discolor</i>	10
248	<i>Ricinus communis</i>	2
249	<i>Rivina humilis</i>	5
250	<i>Rosa sp.</i>	5
251	<i>Roystonea regia</i>	10
252	<i>Salacia fruticosa</i>	2
253	<i>Salvia officinalis</i>	5

254	<i>Sansevieria sp.</i>	10
255	<i>Saraca india</i>	2
256	<i>Sauropus quadrangularis</i>	5
257	<i>Schefflera arboricola</i>	10
258	<i>Schleichera oleosa</i>	2
259	<i>Simarouba glauca</i>	2
260	<i>Solanum melongena</i>	5
261	<i>Spathodea campanulata</i>	2
262	<i>Spathoglottis sp</i>	10
263	<i>Spathiphyllum</i>	3
264	<i>Spondias indica</i>	2
265	<i>Stereospermum suaveolens</i>	1
266	<i>Stereospermum colais</i>	2
267	<i>Strelitzia reginae</i>	1
268	<i>Strobilanthus ciliates</i>	15
269	<i>Strychnos nux-vomica</i>	1
270	<i>Swietenia mahagoni</i>	100
271	<i>Symplocos cochinchinensis</i>	2
272	<i>Synsepalum dulcificum</i>	1
273	<i>Syngonium podophyllum</i>	50
274	<i>Syzygium aqueum</i>	1
275	<i>Syzygium aromaticum</i>	1

276	<i>Syzygium cumini</i>	8
277	<i>Syzygium malaccense</i>	1
278	<i>Syzygium zeylanicum</i>	1
279	<i>Tabernaemontana dichotoma</i>	5
280	<i>Tamarindus indica</i>	7
281	<i>Tecoma stans</i>	2
282	<i>Tectona grandis</i>	15
283	<i>Terminalia arjuna</i>	2
284	<i>Terminalia bellirica</i>	2
285	<i>Terminalia catappa</i>	10
286	<i>Terminalia paniculata</i>	5
287	<i>Theobroma cacao</i>	5
288	<i>Thevetia peruviana</i>	2
289	<i>Thottea siliquosa</i>	3
290	<i>Thuja sp.</i>	2
291	<i>Thunbergia erecta</i>	5
292	<i>Thunbergia laurifolia</i>	1
293	<i>Thymus vulgaris</i>	10
294	<i>Trema orientalis</i>	2
295	<i>Trichosanthes cucumerina</i>	2
296	<i>Uvaria narum</i>	2
297	<i>Vanilla planifolia</i>	5
298	<i>Vateria indica</i>	1

299	<i>Vigna radiata</i>	25
300	<i>Vinca rosea</i>	50
301	<i>Woodfordia fruticosa</i>	2
302	<i>Zingiber officinale</i>	10

Students of related subjects are actively involved in gardening, maintenance, etc. of gardens within the campus. Further, they find the garden an apt place for discussions, combined studies, practicals, aesthetic purposes, spending leisure time, etc. Students are learning garden techniques by working in the garden with the help of teachers concerned. Garden makes ample space and scope for them to conduct practicals including budding, grafting, lawn making, etc. for students of Botany and Environmental studies. They also find this as a good opportunity to observe and learn about birds and butterflies. Students from department of Zoology learn about insects and their role in pollination by observing the same in the botanical garden. So far, 67 plants are identified and maintained in the garden (Table – 2). Students of Botany are doing bee keeping and are learning the bee preference towards plants from the garden. Preparation of vermi-compost and training on the same for those who are interested are conducted in the garden. There are enough resources (species of flora and fauna) available in different gardens and these resources are being utilized by the Botany and Zoology students for project works.

Table – 2. Plants in the Botanical Garden		
Sl.No	Name of Plants	Number of Plants
1	<i>Adenanthera pavonina</i>	1
2	<i>Adhatoda vasica</i>	3
3	<i>Aglaonema sp.</i>	10
4	<i>Allamanda cathartica</i>	5
5	<i>Anthurium species</i>	5

6	<i>Arachis pintoi</i>	>200
7	<i>Aralia sp.</i>	5
8	<i>Asparagus racemosus</i>	1
9	<i>Bambusa glaucophylla</i>	1
10	<i>Bauhinia tomentosa</i>	2
11	<i>Bauhinia variegata</i>	1
12	<i>Begonia sp.</i>	2
13	<i>Bougainvillea sp.</i>	10
14	<i>Cactus sp.</i>	5
15	<i>Callistemon lanceolatus</i>	1
16	<i>Canna indica</i>	5
17	<i>Clematis elliptica</i>	2
18	<i>Clitoria ternatea</i>	2
19	<i>Cocos nucifera</i>	5
20	<i>Costus sp.</i>	7
21	<i>Costus pictus</i>	2
22	<i>Crossandra infundibuliformis</i>	1
23	<i>Croton sp.</i>	11
24	<i>Cuphea ignea</i>	7
25	<i>Cycas circinalis</i>	1
26	<i>Datura metel</i>	1
27	<i>Dieffenbachia sanguine</i>	1
28	<i>Dracaena braunii</i>	2
29	<i>Dracaena fragrans</i>	3
30	<i>Duranta plumieri</i>	1

31	<i>Duranta repens</i>	2
32	<i>Ervatamia coronaria</i>	2
33	<i>Poinsettia pulcherrima</i>	1
34	<i>Gardenia gummifera</i>	3
35	<i>Gardenia jasminoides</i>	2
36	<i>Hamelia patens</i>	1
37	<i>Hibiscus rosa-sinensis</i>	3
38	<i>Holmskioldia sanguinea</i>	1
39	<i>Hypoestes phyllostachya</i>	3
40	<i>Ixora chinensis</i>	2
41	<i>Ixora philippinensis</i>	1
42	<i>Jasminum grandiflorum</i>	1
43	<i>Kopsia fruticosa</i>	1
44	<i>Lantana camara</i>	10
45	<i>Melastoma malabathricum</i>	5
46	<i>Murraya exotica</i>	2
47	<i>Nelumbium speciosum</i>	3
48	<i>Nerium indicum</i>	2
49	<i>Nymphaea pubescens</i>	2
50	<i>Osmoxylon lineare</i>	6
51	<i>Pachystachys lutea</i>	4
52	<i>Pandanus odoratissimus</i>	2
53	<i>Passiflora sp</i>	1
54	<i>Piper longum</i>	2

55	<i>Piper nigrum</i>	3
56	<i>Plumeria indica</i>	1
57	<i>Quisqualis indica</i>	2
58	<i>Rivina humilis</i>	4
59	<i>Rosa sp.</i>	2
60	<i>Salvia officinalis</i>	2
61	<i>Sansevieria roxburghiana</i>	5
62	<i>Schefflera arboricola</i>	3
63	<i>Thevetia peruviana</i>	1
64	<i>Thuja sp.</i>	3
65	<i>Thunbergia laurifolia</i>	2
66	<i>Uvaria narum</i>	1
67	<i>Woodfordia fruticosa</i>	1

It would be nearly impossible to learn taxonomy and morphology for Botany students if plants are not available nearby. Different species of plants in the garden make this possible. Students are keen in maintaining species that are dealt with in their syllabus for practicals and further observation.

The authorities are keen in developing the garden to higher levels by getting funds from sources such as spices board. The grants in aid was rightly spent in developing a spice garden with respective identification names and other details pertaining to the species in the spice garden.

The department of Botany and Nature Club initiated an agriculture garden where different species such as ginger, turmeric, chilli, etc are grown (Table-3). The vegetables harvested from the vegetable garden are utilised either in different

messes or sell it out among the staff and students. A portion is shared among the volunteers.

Table – 3. Vegetables and other Crop Plants		
Sl. No.	Species of plants	Approximate Yield (kg)
1	<i>Abelmoschus esculentus</i> – ladies finger	30
2	<i>Amaranthus spp</i> – cheera	15
3	<i>Amorphophallus paeoniifolius</i> – chena	50
4	<i>Benicasa hispoida</i> – kumblanga	50
5	<i>Brassica oleracea</i> var. <i>boatrytis</i> – cauliflower	10
6	<i>Brassica oleracea</i> var. <i>capitata</i> – cabbage	15
7	<i>Capcicum annum</i> – chilly	5
8	<i>Carica papaya</i> – papaya	75
9	<i>Coccinia grandid</i> – koval	60
10	<i>Colocasia esculenta</i> – chembu	180
11	<i>Cucumis sativus</i> – cucumber	220
12	<i>Cucurbita mellonia</i> – pumkin	250
13	<i>Curcuma longa</i> – turmeric	25
14	<i>Dioscorea alalta</i> – cherukizhangu	40
15	<i>Dioscorea esculenta</i> – kachil	90
16	<i>Lagenaria siceraria</i> – bottle gourd	20
17	<i>Lycopersicum esculentum</i> – tomato	18
18	<i>Manihot esculenta</i> – tapioca	150

19	<i>Momordica charantia</i> – bitter gourd	30
20	<i>Moringa oleifera</i> – drum stick	20

4.4.1.2. Arboretum

Nirmala College is maintaining an arboretum where natural species of plants are maintained (Table – 4). The plant diversity in the arboretum includes star plants, concept oriented plants based on *ayurvedic* preparations, etc. It is a place to conserve endemic plant species as well. The college authority is keen to enrich the arboretum by adding plants of different values.

Table – 4. List of Plants in the Arboretum		
Sl. No.	Species of plant	Number of Plants
1	<i>Garcinia gummi-gutta</i>	2
2	<i>Cinnamomum verum</i>	2
3	<i>Mangifera indica</i>	1
4	<i>Saraca asoca</i>	1
5	<i>Annona muricata</i>	1
6	<i>Calophyllum inophyllum</i>	1
7	<i>Terminalia bellirica</i>	1
8	<i>Simarouba glauca</i>	1
9	<i>Bauhinia variegata</i>	1
10	<i>Stereospermum colais</i> var. <i>colais</i>	2
11	<i>Mimusops elengi</i>	2
12	<i>Artocarpus heterophyllus</i>	2
13	<i>Careya arborea</i>	1

14	<i>Terminalia cuneata</i>	2
15	<i>Briedelia retusa</i>	3
16	<i>Racosperma mangium</i>	1
17	<i>Swietenia macrophylla</i>	4
18	<i>Artocarpus hirsutus</i>	3
19	<i>Bombax malabaricum</i>	1
20	<i>Pongamia glabra</i>	2
21	<i>Delonix regia</i>	3
22	<i>Pithecolobium saman</i>	1
23	<i>Terminalia catappa</i>	1
24	<i>Syzygium cumini</i>	2
25	<i>Macaranga peltata</i>	1
26	<i>Holorrhena antidysenterica</i>	1
27	<i>Michelia champaca</i>	1
28	<i>Oroxylum indicum</i>	1
29	<i>Adenanthera pavonina</i>	1
30	<i>Lagerstroemia speciosa</i>	2
31	<i>Alstonia scholaris</i>	1
32	<i>Ficus benjamina</i>	1
33	<i>Millingtonia hortensis</i>	1
34	<i>Diospyros peregrine</i>	1
35	<i>Hopea parviflora</i>	1
36	<i>Ficus carica</i>	1
37	<i>Chrysophyllum cainito</i>	1
38	<i>Toona ciliata</i>	1

4.4.1.3. Fruit Yielding Plants

Currently, in Kerala, there is a trend in cultivation of different species of fruit yielding plants in farms and orchards. Nirmala College is also giving emphasis in adding new species and varieties of different fruit yielding plants in their campus. This would add value and awareness among students and staff about such plants. There are about 20 different fruit yielding species are available in the campus (Table – 5). Although the fruit yielding species are cultivated at different places in a scattered manner, they are properly labelled and displayed.

Table – 5. List of Fruit Yielding Plants		
Sl. No.	Species of plants	Number of Plants
1	<i>Ananus comosus</i>	5
2	<i>Annona muricata</i>	4
3	<i>Annona squamosa</i>	3
4	<i>Artocarpus integrifolia</i>	8
5	<i>Artocarpus hirsutus</i>	5
6	<i>Citrus limon</i>	4
7	<i>Garcinia mangostana</i>	3
8	<i>Hylocereus undatus</i>	2
9	<i>Mangifera indica</i>	3
10	<i>Morus alba</i>	2
11	<i>Musa paradisiaca</i>	1
12	<i>Nephelium lappaceum</i>	2
13	<i>Nephelium mutabile</i>	1

14	<i>Passiflora edulis</i>	2
15	<i>Phyllanthus emblica</i>	4
16	<i>Psidium guajava</i>	5
17	<i>Punica granatum</i>	6
18	<i>Spondias pinnata</i>	2
19	<i>Syzygium jambos</i>	3
20	<i>Syzygium samarangense</i>	4
21	<i>Tamarindus indica</i>	2

4.4.1.3. Medicinal Plants

The diversity of medicinal plants in any place, especially in an academic campus is indicative the emphasis that the institute given towards traditional knowledge. This would be a platform for awareness, learning, and source for local usage. Nirmala College is maintaining a medicinal plant garden that consists of a good wealth of plant species. The present status of flora that have medicinal importance is representative of regional and local floristic diversity. About 89 plant species in the medicinal plant garden were found maintained on the campus (Table – 6).

Table – 6. Medicinal Plants		
Sl. No.	Name of Plants	No. of Plants
1	<i>Achyranthes aspera</i>	2
2	<i>Adenanthera pavonina</i>	5
3	<i>Adhatoda vasica</i>	1
4	<i>Aerva lanata</i>	6
5	<i>Aloe vera</i>	5

6	<i>Alpinia calcarata</i>	6
7	<i>Alpinia galanga</i>	3
8	<i>Alstonia scholaris</i>	4
9	<i>Andrographis paniculata</i>	2
10	<i>Anisomeles indica</i>	6
11	<i>Asparagus racemosus</i>	2
12	<i>Azadirachta indica</i>	3
13	<i>Bacopa monnieri</i>	4
14	<i>Biophytum sensitivum</i>	3
15	<i>Boerhavia diffusa</i>	5
16	<i>Butea monosperma</i>	2
17	<i>Calotropis gigantea</i>	2
18	<i>Cardiospermum halicacabum</i>	5
19	<i>Careya arborea</i>	8
20	<i>Cassia fistula</i>	4
21	<i>Cassia occidentalis</i>	2
22	<i>Catharanthus roseus</i>	3
23	<i>Centella asiatica</i>	6
24	<i>Chasalia curviflora</i>	3
25	<i>Cinnamomum zeylanicum</i>	6
26	<i>Clerodendrum viscosum</i>	3
27	<i>Clitoria ternatea</i>	5
28	<i>Cocos nucifera</i>	2

29	<i>Coffea arabica</i>	2
30	<i>Coriandrum sativum</i>	3
31	<i>Costus pictus</i>	4
32	<i>Curcuma longa</i>	1
33	<i>Cycas circinalis</i>	2
34	<i>Datura metel</i>	3
35	<i>Datura stramonium</i>	5
36	<i>Diospyros sp.</i>	4
37	<i>Duranta plumieri</i>	5
38	<i>Eclipta alba</i>	2
39	<i>Elephantopus scaber</i>	2
40	<i>Elettaria cardamomum</i>	3
41	<i>Emblica officinalis</i>	2
42	<i>Emelia sonchifolia</i>	3
43	<i>Euphorbia hirta</i>	2
44	<i>Evolvulus alsinoides</i>	2
45	<i>Ficus benghalensis</i>	4
46	<i>Ficus microcarpa</i>	4
47	<i>Ficus racemosa</i>	3
48	<i>Ficus religiosa</i>	2
49	<i>Garcinia mangostana</i>	5
50	<i>Heliotropium indicum</i>	2
51	<i>Hemidesmus indicus</i>	1

52	<i>Hibiscus rosa-sinensis</i>	3
53	<i>Holoptelea integrifolia</i>	6
54	<i>Holarrhena antidysenterica</i>	4
55	<i>Hopea parviflora</i>	8
56	<i>Ipomoea sepiaria</i>	3
57	<i>Ixora coccinea</i>	6
58	<i>Kaempferia galangal</i>	5
59	<i>Lanea coromandelica</i>	4
60	<i>Leucas aspera</i>	2
61	<i>Mimosa pudica</i>	3
62	<i>Murraya koenigii</i>	2
63	<i>Myristica fragrans</i>	5
64	<i>Nelumbium speciosum</i>	3
65	<i>Ocimum basailicum</i>	5
66	<i>Ocimum sanctum</i>	4
67	<i>Oxalis corniculata</i>	2
68	<i>Phyllanthus niruri</i>	3
69	<i>Pimenta dioica</i>	6
70	<i>Piper longum</i>	5
71	<i>Plumbago rosea</i>	2
72	<i>Pongamia pinnata</i>	3
73	<i>Psidium guajava</i>	4
74	<i>Rauwolfia serpentina</i>	2

75	<i>Rosa indica</i>	3
76	<i>Sansevieria roxburghiana</i>	1
77	<i>Saraca indica</i>	3
78	<i>Scoparia dulcis</i>	1
79	<i>Strobilanthes ciliatus</i>	2
80	<i>Strychnos nux vomica</i>	3
81	<i>Syzygium aromaticum</i>	2
82	<i>Terminalia catappa</i>	5
83	<i>Tinospora cordifolia</i>	6
84	<i>Tragia involucrata</i>	4
85	<i>Tridax proccumbens</i>	2
86	<i>Vateria indica</i>	3
87	<i>Vernonia cinerea</i>	5
88	<i>Vitex negundo</i>	2
89	<i>Zingiber officinale</i>	2

4.4.1.4. Awareness Programs

Several significant and fruitful awareness programs both students and staff of the campus are arranged every year in the campus. Reflections from students are evident how effective such awareness programs conducted in the campus.

Major programs conducted in the campus during the last three years are:

Environment Related

1. Nature camps.
2. Field visits to different types of ecosystems.
3. Observances of Environment Day, Wetland day, Ozone day etc.

4. Arranging seminars and symposiums on awareness and conservation by nature and natural systems.

Conservation Activities

5. Collection and distribution of saplings.
6. Bird and Butterfly watching.
7. Sapling Planting etc.

Best Practices

8. 2016-2017 organic farming
9. 2016-2017 Paddy cultivation
10. Engaging students in maintaining spices garden
11. Engaging students in maintaining herbal garden and medicinal garden.
12. Maintaining of *shanthistal*
13. Participation of teachers in different orientation program
14. Initiation of vermi-compost.
15. Initiation of bio gas plant.

Trainings and Workshops

16. Mushroom cultivation workshop.
17. Apiculture workshop
18. Flower arrangements workshop
19. Workshop on eco-friendly carry bags

Campaigns

20. Plastic free campaign
21. Nature camps, field trips and

Some of these activities are year round programs and others are regular year wise or semester wise or any other stipulated time bound programs. This indicates that students and teachers concerned are actively involved in green activities in the campus.

4.4.2. Water Management

4.4.2.1. Major Findings.

- The ponds and other water resources in the college are well maintained.
- Separate tanks were installed for different blocks and for different purposes. This enables to use water with maximum potential control.
- The college has rain water harvesting mechanism which is to be appreciated. This will help generate awareness about the importance of water conservation and shall act as a model system to be followed by other institutions as well.
- Wick irrigation farming and drip irrigation systems present in the campus were found to be effective in reducing the amount of water used in agriculture sector.
- The college organizes awareness programmes on water conservation frequently to spread the message of significance of conserving water.
- Students who are involved in green committees are doing a good job in water related awareness programmes.
- 92304 L of water is used per day by the college for its different uses (Table – 7).
- 200 L of water per day is lost through the leaking of pipes (Table – 7).
- The water consumption in the summer season is significantly high compared to other months.

Table- 7. Details of water analysis of Nirmala College					
Activity	Average use per activity in liters	Number of activity/ day	Water use/person/day (L)	Number of persons using water	Total water consumption/day(L)
Washing hands and face	6L	thrice	2L/head	3009	18054L
Bath	60L	twice	30L/head hostel only	390	23400L

Washing clothes	20L	once	20L/head hostel only	390	7800L
Toilet flush	10L	at least 3	10L/head	500	5000L
Leaking/dripping(1 drop/second /day)	nil	nil	nil	nil	200L
Garden use	1500L	twice	nil	nil	3000L
Cooking (average)	3000L	four times	nil	500	12000L
Cleaning Floor	10000L	once	nil	nil	10000L
Cleaning college bus	nil	nil	nil	nil	nil
Lab uses	2.5L	twice	5L	360	850L
Construction work	3000L	twice	nil	nil	6000L
Any other activity	3000L	twice	nil	nil	6000L
Total water use					92304L

4.4.2.2. Suggestions

- There is no particular mechanism to find the water wastage. This has to be dealt with utmost care without delay and has to be included in the future action plan.
- There is no water consumption monitoring system in the college.
- The college does not have waste water treatment for waste water generated from laboratories, canteen, hostel kitchen, toilets, bathrooms and office rooms.
- The waste water from canteen and kitchens is not suitably controlled and is not used for gardening. This has to be addressed and suitable action plans have to be evolved.

- No adequate facilities available in the college to treat the waste water from chemical laboratories.
- Water fountain in the college was found to be dysfunctional. This need to be activated.

4.4.3. Energy Management

An assessment of energy consumption, energy sources used, energy management, lighting devices used and other appliances used by the campus community is an important aspect of sustainability of the community. Hence this is a relevant aspect of the assessment. The audit team assessed the number of electrical appliances and their respective uses in terms of consumption of energy per month in KWh. This indicates the energy management of the campus. Based on the assessment we made suggestions and recommendations.

Table- 8. List Electrical Instruments		
Sl. No.	Name Instruments	No. of Instruments
1	Heating Mantle	23
2	Power Supply	66
3	UV-Disinfection System	54
4	Magnetic Stirrer	19
5	Function Generator	18
6	Fridge	12
7	Fume Exhaust Hood	12
8	Exhaust Fan	7
9	Centrifuge	6
10	Mixer Grinder	5
11	Stabilizer	5
12	Conductivity Meter	4
13	Digital Potentiometer	4
14	Furnace	4
15	Network Switch	4
16	Weighing Balance	4
17	Incubator	2

18	Mixer Galvan	2
19	Photoelectric Colorimeter	2
20	Concentric Rig Bath	1
21	Distil Unit	1
22	Electric Kettle	1
23	Electron Microscope	1
24	Laminar Air Flow	1
25	Mixer	1
26	pH Meter	1
27	Pump	1
28	Rota Evaporator	1
29	UV Spectrophotometer	1
30	Computer	397
31	Hot Air Owen	2
32	Iron Box	2
33	Oven	2
34	Hot Air Owen	1
35	Induction Cooker	1
36	Water Bath	1
37	Wax Bath	1
38	LCD TV	21
39	Cooler	8
40	Freezer	1
41	Street Light (Led)	71
42	Street Light (Sodium)	6
43	Street Light (Tube)	1
44	Inverter	6
45	Ups	3
46	Fan	890
47	Tube	400
48	Led Bulb	845
49	Led Tube	171
50	Cfl	154
51	Speaker	48
52	Projector	30
53	Ac	25
54	Bulb	24
55	Printer	22
56	LPG Per Month	11
57	Amplifier	10

58	Wi-Fi Modem	7
59	Photocopier	5
60	Aquarium	1
61	Scanner	3
62	Barcode Reader	2
63	Electric Bell	2
64	Server	2
65	Blue Ray Player	1
66	Coffee Machine	1
67	Duplicator	1
68	I Mac	1
69	Washing Machine	1
70	Treadmill	1
71	Server Unit	1
72	Tailoring Machine	1

4.4.3.1. Renewable Source of Energy – Solar Power Plants

The college has established a 20 KW solar power plant, of which 15 KW is shared on common grid (KSEB) and 5KW is utilised in the campus itself. The beneficiary of the solar power plant is the MCA building. At present it is working with its fullest establishment capacity and the campus is making maximum use out of it. By learning the importance and power conservation by tapping energy from renewable energy sources, the management plan to extend the capacity of the solar power plant by installing more solar power plants in the campus.

Following are the details of generation and utilization of power generated out of solar power plants.

- Total energy produced by the solar panels during 2018-19 – 32850 KWh
- Energy supplied to the KSEB grid – 21250 KWh
- Energy utilised from the KSEB supply – 11600 KWh

Using the full establishment capacity of the solar power plant, the college generates 32850 KWh that is apparently 90KWh /day. About 15.9% of the total energy requirement is met with this power generation using renewable energy source.

Other than this, the biogas plant installed in the campus generates about 288kg of biogas that is being utilised in the campus itself. This reduces the total cost of their cooking gas expenditure to about Rs. 30000 during the year 2018-19.

It is a good practice and model for the campus community to aim at generating the required power and cooking gas inside the campus itself by using renewable energy sources.

4.4.3.2. Findings

- Electricity charges – Rs.142392.5/month.
- Number of gas cylinders used – Rs. 77.5/month.
- Cost of Gas cylinders used – Rs. 520800/year (Rs.560/cylinders).
- Monthly amount paid for electricity and gas – Rs. 185792.5 (2016).
- Average monthly amount paid for electricity during the last three years – Rs. 108963.2
- Change in energy cost per month from 2016 = Rs. -33429. 28
- Cost of generator fuel – Rs.1000/month.
- Biogas generated per month = 24kg (288 kg during 2018-19 which is equivalent to 20 cylinders of cooking gas).
- Energy generated by the biogas plant per month = equivalent to 1.5 LPG cylinders.
- With the establishment of solar power plant the campus management could reduce the dependency on public electricity supply and the cost has come down to 108963.2. This enabled them to save about Rs. 33429.28 per month.

Table-9 Nonth wise Energy Consumption in KWh		
Sl. No	Name of the Instrument	Energy Consumption, kWh/month
1	Heating Mantle	12.65
2	Power Supply	52.27
3	Uv-Disinfection System	89.10
4	Magnetic Stirrer	20.90
5	Function Generator	4.95

6	Fridge	33.00
7	Fume Exhaust Hood	158.40
8	Exhaust Fan	69.30
9	Centrifuge	30.36
10	Mixer Grinder	165.00
11	Stabilizer	27.50
12	Conductivity Meter	2.20
13	Digital Potentiometer	1.32
14	Furnace	132.00
15	Network Switch	1.32
16	Weighing Balance	0.44
17	Incubator	6.60
18	Photoelectric Colorimeter	0.66
19	Concentric Rig Bath	16.50
20	Distill Unit	33.00
21	Electric Kettle	22.00
22	Electro Microscope	1.10
23	Laminar Air Flow	11.00
24	Mixer	5.50
25	Ph Meter	0.22
26	Pump	7.70
27	Rota Evaporator	16.50
28	Uv Spectrophotometer	5.50
29	Computer	3493.60
30	Hot Air Owen	22.00
31	Iron Box	22.00
32	Oven	132.00
33	Hot Air Oven	11.00
34	Induction Cooker	1.65
35	Water Bath	11.00
36	Wax Bath	3.30
37	Lcd Tv	69.30
38	Cooler	220.00
39	Freezer	44.00
40	Inverter	0.49
41	Ups	0.01
42	Fan	4895.00
43	Tube	704.00
44	Led	334.62
45	Led Tube	300.96
46	Cfl	81.31
47	Speaker	2.64
48	Projector	165.00
49	Ac	550.00
50	Bulb	63.36

51	Printer	24.20
52	Amplifer	88.00
53	Wifi Modem	5.54
54	Photocopier	27.50
55	Aquarium	52.80
56	Scanner	0.17
57	Barcode Reader	0.22
58	Electric Bell	0.09
59	Server	132.00
60	Blue Ray Player	0.02
61	Coffee Machine	110.00
62	Duplicator	5500.00
63	I Mac	2.75
64	Washing Machine	2.20
65	Treadmill	110.00
66	Server Unit	33.00
67	Tailoring Machine	8.80

Out of 1648 lighting fixtures, there are 1087 LED based lights, which is a positive step taken towards the conservation of energy. In spite of a sylvan campus, there are 890 fans which consumes about 4895 units per month. This can be controlled by enhancing natural air circulation via proper ventilation. There are 397 full-fledged PCs which require about 3493 units of electricity for their operation. The water distribution system of the campus is a well-designed one. The water tanks kept in optimum locations, resulting in minimum energy wastage. There is a functional biogas plant, inside the campus, which aids in saving few LPG cylinders used for cooking/heating.

Monthly Energy Utilization by Different appliances in the campus	
Item	Total Energy in KWh
Bulb	1507.44
CFL Bulb	813.12
Fans	7832
Air conditioners	4785

Other Cooling apparatus	675
Computers	10917.5
Photocopier machines	82.5
Inverters	1584
TV	283.5
Total	28480.1

4.4.4. Carbon Footprint Audit

The most common greenhouse gases are carbon dioxide, water vapour, methane, nitrous oxide and ozone. Of all the greenhouse gases, carbon dioxide is the most prominent

greenhouse gas, comprising 402 ppm of the Earth's atmosphere. Each human being is contributing towards adding green-house gases to the atmosphere depending upon his day to day activities and usage of instruments and machineries for different purpose.

Release of carbon dioxide gas into the Earth's atmosphere through human activities is commonly known as carbon footprint. An understanding about the same of any institute where large number of anthropogenic activities are happening is important to assess the contribution of emission of gases that are responsible for Green House Effect. Auditing for carbon footprint of Nirmala College Campus was done using a detailed questionnaire, so that the impact of the community on global environment can be assessed.

4.4.4.1. Major Findings

1. Total number of Students – 2682
2. Total number of Teachers – 143
3. Number of non-teaching staff – 20
4. Number of persons using cars - 27 (30L fuel per day)
5. Number of persons using two wheelers - 104 (50L fuel per day)
6. Number of persons using public transport – 1539, 21 km per day, average (180 L of fossil fuel per day)

7. Number of cycles used in the campus– 0
8. LPG usage - 77.5 Cylinders per month
9. Total fossil fuel usage per day - 260 L, apart from LPG and fuel for generators

It is evident that majority of the campus community are relying on public transport system for commutation leading to the expense of 180 L of fuel per day. This shall be considered as a very conservative approach. Assuming that 20 persons travel together combined with number of motorcycles and cars lead to the usage of 260L of fuel per day. This causes the emission of about 702kg of CO₂ per day. This measurement is excluding the natural emission of CO₂ by human by breathing (ie. 1140g/day). Consumption of one litre LPG releases about 1.5kg of CO₂. At the rate of 77.5 cylinders per month the college is using about 1085 L of LPG that releases 1627.5kg CO₂ per month. Since there is no data from similar institution available a comparison of carbon footprint is not attempted.

Chapter – 5

Recommendations

5.1. General recommendations

1. All the lists of plants shall be uploaded in the college site.
2. A file shall be maintained to assess and analyse the usage of garden by different stakeholders.
3. There shall be a digital platform where students and staff shall get details about plants and animals in the campus. This may include name, information of systematic position as per standard classifications, usage, value, further references, etc.
4. The name boards shall be updated with QR code technology that enable the students and staff to scan the QR code to access relevant information of the taxa.
5. There shall be a discussion forum in the campus where a discussion on green activities is possible by students, alumni, staff, etc. and the moderator of the group shall update the information in the digital repository accordingly.
6. Students and staff shall take initiative to start live campus discussion groups where green conservation and awareness shall be the main agenda.
7. The deliberations shall be shared among students and other stakeholders through campus/social media.

5.2. Water Management

1. Strengthening awareness on water conservation among student and teacher communities.
2. Observe ‘world water day’ on March 22nd with different programmes (cycle rally, street play, flash-mob, poster, elocution etc. can be conducted).
3. Apply for *Bhoomithrasena* club (This is an initiative of Directorate of Environment and Climate Change, Govt. of Kerala) to get financial assistance.
4. ‘Save Water’ posters to be affixed in the classrooms, hand washing areas.
5. Repair water leaks and leaky toilets immediately.

6. Install water aerators and automatic shut-off devices on faucets.
7. Use low-flow shower heads and timer shut-off devices with automatic sensors to reduce water use during showers.
8. Bring a water bottle to college. At the end of the day, any leftover can be poured onto the garden.
9. Set up an efficient water recycling system in the college canteen.
10. Install more rain water harvesting systems.
11. Install waste water system for chemistry labs.
12. Use green solvents and green methods (e.g., double burette titration) in the chemical laboratories.

3.5. Energy Management

1. The on grid solar power plant can bring down electricity costs and might prove to bring in financial benefits in the long run. Being at a relatively high lying area of the town, there would be no issues with sunshine, particularly in summer.
2. Gradual replacement of existing non LED based lights to LEDs can further bring down costs for lighting.
3. Replacement of existing electric fans with BLDC fans can significantly reduce power consumption and help in a good reduction in electricity charges.
4. Instead of using desktop workstations, we could consider desktop virtualization, wherever possible which could lead to reduced power consumption and reduced power costs.

5.4 Carbon Footprint

1. Operate a college bus, with an optimal route planning, could reduce fossil fuel consumption.
2. Encourage the use of bicycles and public transport system by the community, particularly the student community.
3. Planting of trees to negate the effect of burning of fossil fuels.
4. Carpooling, wherever possible, particularly by those who are using cars should be encouraged.

Chapter – 6

Future Action Plans

1. Year wise internal audit on green, water and energy to be conducted by respected teachers.
2. Proper management and month wise mapping of water and energy usage to be conducted by monitoring the same in the records.
3. Department wise awareness programs to be organised by department staff representative to each committee.
4. Proper waste water management
5. Proper monitoring and disposal of waste discharge from chemical laboratories
6. Implementation of sign boards and indications of water and energy usage.
7. Energy maintenance by proper usage of electrical appliances.
8. A timber garden and museum to be implemented
9. Vegetable and agriculture crop planting has to be increased using advanced technologies.
10. Promotion of visit to agriculture farm lands and processing centres.
11. Marketing of vegetables and crops cultivated in the campus.

The students and staff who are active in green related activities have a clear vision about how and what should be planned for a greener campus. They think that planting of more saplings during the world environment day would cater more awareness and enthusiasm in students who join afresh each year. The college is also planning to initiate plant a tree/adopt a tree program where each student will be planting a sapling and taking care of it during his or her stay in the college. Although the college follow a university curriculum by implementing several such awareness program in their academic and non-academic activities promote more students turn to green activities.

6.1. Conclusions

1. The management and other authorities are keen to make the campus a green campus
2. Nirmala College is making learning process by practical approach. This is fulfilled by setting different types of gardens, arboretum concept based garden and conservation of water and energy.
3. Staff and students are aware about the commitment of the institute towards the society.
4. Green audit at times makes the campus authority to understand the effect of implications towards greenness and conservation of water and energy.
5. The evaluation process proved that the authorities have applied implications suggested in the previous audit.
6. The campus community functions are oriented with an eco-friendly approach that enables the student community to develop a genuine approach on conservation of nature, and natural resources.
7. The results presented in the present report would be helpful for the authorities to make future action plans to develop more sophisticated ideas in bringing more values in future efforts towards conservation of biodiversity, water and energy.
8. We, the Heartian Green Audit team, submitting the comprehensive audit report to the authorities of Nirmala College Campus. We hope the audit finding would help them implement better management plan to achieve a complete green campus, save maximum water and energy for a better future.

We suggest the college management to conduct the next audit after three years, ie. March 2021. This would help them understand whether they are heading forward by achieving the set forth plans and goals.

Acknowledgements

The Heartian Green Audit team thanks the Management and the Principal of Nirmala College, Muvattupuzha for entrusting us the green audit of their campus. We wholeheartedly thank the teaching and non-teaching staff and students for their timely support rendered to the green audit team at different stages of the process that helped us to complete the audit in time. We also thank heads of various departments and the teacher in charge from each department for sharing documents and information in time. The support from different clubs and fora was adequate and timely. We thank the teacher and student coordinators of different clubs and fora for the same. The support from the office staff during visit to the campus for verification of documents is also highly appreciated.

Plate I



Plate I. A. The campus of Nirmala College from entry point.



Plate I. B. Another view of the campus of Nirmala College from entry point in front of the Library

Plate II



Plate II. A. An aerial of Nirmala College campus.



Plate II. B. Another view evidentially indicating the attempt to make the campus green

Plate III



Plate III. A. Students carrying out experiments and practicals in the arboretum



Plate III. B. Students are involved in learning process using the resources in the medicinal plant garden

Plate IV



Plate IV. A. A view of Agriculture garden where vegetables are maintained.



Plate IV. A. Students are involved in watering and maintaining the campus garden

Plate V



Plate V. A. The Solar Power plants installed in Nirmala College.



Plate V. B Students and teachers inspecting the Solar Power plants installed in Nirmala College.

Plate V



Plate V. A. The Green Audit visiting Nirmala College Arboretum.



Plate V. B The Green Audit team with the internal supporting members.

Annexure – I
Green auditing of Nirmala College, Muvattupuzha
Auditing for Green campus management

1. Is there a garden in your college? Area?
2. Is there concept based garden (star plants, medicinal plants, endemic species, agriculture, etc.), specify area for each.
3. Do students spend time in the garden? If so, approximate time and purpose. (Lists with priority Annexure-I).
4. List the plants (scientific names, Family, etc.) in the garden, with approx. numbers of each species (Annexure-II).
5. List of campus flora (attach a list of plants with details, including scientific name, family, approximate number of plants, etc.) in your campus
6. Name and number of the medicinal plants in your college campus.
7. Any threatened plant species planted/conserved (provide a list with their threat status).
8. List the plants to be planted on your campus in the next three years. (**Trees, vegetables, herbs, etc.**)
9. List the species planted by the students, with numbers (Annexure –III).
10. Have you got any external funding for developing gardens in the campus? If yes, year, agency, and amount of funding.
11. Explain how you utilized funds for gardens.
12. Whether you have displayed scientific names of the plants in the Campus?
13. What are the vegetables cultivated in your vegetable garden?
(Mention the quantity of harvest in each season).
14. How much water is used in the vegetable garden and other gardens?
15. Mention the source and quantity of water used (per month).
16. Are you using any type of recycled water in your garden?

17. Who is in charge of gardens in your college?
18. Is there any permanent staff to look after gardens in the campus?
19. List the name and quantity of pesticides and fertilizers used in your gardens?
20. Are you doing any organic practice in your campus? List them?
21. Do you have any composting pit (specify what compost) in your college? If yes, what you do with the compost generated?
22. Do you have a vegetable garden on the campus?
23. If yes, how the harvested vegetables are utilized? Do you have any market in the campus?
24. Is there a nature club in your college? If yes what are the activities?
25. Is there any arboretum in your college? If yes details of the trees planted.
26. Is there any fruit yielding plants in your college? If yes details of the trees planted.
27. Is there any groves in your college? If yes details of the trees planted.
28. Is there any irrigation system in your college?
29. What is the type of vegetation in the surrounding area of the college?
30. What are the nature awareness programs conducted in the campus? (2014-19). Provide a list (annexure-IV)
31. What are the involvement of students in the green cover maintenance?
Planting saplings and maintenance
32. What is the total area of the campus under tree cover? Or under tree canopy?
33. Share your future plans for further improvement of green cover.
34. Have you incorporated green conservation aspects in your curriculum?
35. How often you conduct public programs on green conservation?
36. Do students reach out to the public in conveying the message of nature conservation?

Annexure – II

Green Auditing of Nirmala College, Muvattupuzha

Questionnaire for Water Management Auditing

1. What is the total Area of the campus?
2. Number of total teachers, non- teaching staff and students in the campus.
3. Provide a list with different uses of water in the campus (Annexure 2-I).
4. Name different sources of water in your college?
5. How many wells are there in your college?
6. Number of electric motors used for pumping water from each well?
7. What is the total horse power of each motor?
8. What is the depth of each well?
9. What is the present depth of water in each well?
10. How does your college store water?
11. Capacity of the overhead water tank/s in the campus? (in litres)
12. Quantity of water pumped every day? (in litres)
13. How do you justify that the water usage is judicious in the campus?

14. Is there any water wastage? If yes, specify why and how.
15. Is there any mechanism to identify water wastage in the campus, explain (Annexure 2-II)
16. What are the possible ways to check wastage of water?
17. Is there any waste water generation happening in the campus?
18. What are the possible sources of waste water in the campus?
19. Where does the waste water go?
20. Are you reusing the waste water after recycling it?

21. What are the systems of management of water used in your labs, especially Chemistry lab
(or labs where experiments are happening involving chemicals)?
22. Does this water get mixed with ground water?
23. Is there any treatment for the lab water after usage?
24. Is there a system of practice of green chemistry in your campus? Give details.

25. Write down four ways that could reduce the amount of water used in your college.

26. Record of water use from the college water meter for six months.
27. Amount, if any, as charges towards water paid for water connections.
28. Number of water coolers in the campus. Amount of water used per day? (in litres)
29. Number of water purifiers in the campus, if any.
30. Number of water taps in the campus. Amount of water used per day?
31. Number of bath rooms and toilets separately for staff rooms, common, hostels (Annexure 2- III).
32. Number of toilets?
33. Amount of water used per day in the toilets?
34. Number of water taps in the canteen. Amount of water used per day?
35. Amount of fire-wood used in the canteen kitchens?
36. How much ash collected after burning fire wood per day in the canteen?
37. Amount of water used per day for irrigation purpose.
38. Number of water taps in laboratories. Amount of water used per day in each lab?
39. Number of taps in hostels.
40. Total use of water in each hostel?
41. Provide a list of month wise water usage in different areas in the campus
42. Is there any water used for agricultural purposes?
43. Is there any rain water harvest system in the campus? If yes, details of the storage capacity?
44. Report on the status of their functioning.
45. Provide number of damaged taps in the campus? Amount of water lost due to damaged taps or water supply system per day?
46. How do you convey the message of water conservation in the campus?
47. How many water fountains are there? _____

48. How often the garden is getting irrigated?
49. Amount of water used to water the ground?
50. Amount of water used for college bus cleaning? (litres per day)
51. Is there any other way by which water is being utilized?.
52. Area of the college land which is under concrete tiles.
53. Is there any future plan for the water management in the campus?
54. Are there any water saving techniques followed in your college? Explain?
55. Is there any mechanism by which message on water conservation is been conveyed to staff and students.

Annexure – III
Green auditing of Nirmala College, Muvattupuzha
Questionnaire for Energy Management Audit

1. List out ways of energy usage in the campus. (Electricity electric stove, kettle, microwave, incinerator; LPG, firewood, Petrol, diesel and others).
2. Electricity bill amount for the last three years.
3. Amount paid for LPG cylinders for last three years.
4. Any other payments towards energy related matters for last three years in the campus
5. Weight of firewood used per month and amount of money spent? Also mention the amount spent for petrol/diesel/others, if any?
6. Are there any energy saving methods employed in your college? If yes, please specify.
7. What are the types of bulbs used in the campus?
8. Provide a list of number of bulbs of each types.
9. Provide the total energy utilization by each types of bulb per month.
10. How many CFL bulbs has your college installed? Mention use (Hours used/day for how many days in a month)
11. Energy used by each bulb per month? (For example- 60 watt bulb x 4 hours x number of bulbs = kWh).
12. How many LED bulbs has your college installed? Mention use (Hours used/day for how many days in a month)
13. How many incandescent (tungsten) bulbs has your college installed? Mentions use (Hours used/day for how many days in a month)
14. How many fans installed in the campus? Mention use (Hours used/day for how many days in a month)
15. Energy used by all fans per month? (kwh)
16. How many air conditioners are in use in the campus? Mention time of their usage (Hours used/day for how many days in a month).
17. Energy used by all air conditioners per month? (kwh).
18. How many electrical equipments including weighing balance used in the campus? Mention use (Hours used/day for how many days in a month)
19. Energy used by each such electrical equipment per month? (kwh).
20. How many computers were in use in the campus? Mention the energy use. (Hours used/day for how many days in a month)
21. Energy usage by all computers per month? (kwh)

22. How many photocopier machines are installed and in use at present in the campus? Mention use (Hours used/day for how many days in a month).
23. Energy used by all photocopier per month? (kwh) Mention use (Hours used/day for how many days in a month)
24. How many cooling apparatus present in the campus? Mention use (Hours used/day for how many days in a month)
25. Energy used by all cooling apparatus per month? (kwh) Mention use (Hours used/day for how many days in a month).
26. How many inverters your college installed? Mentions use (Hours used/day for how many days in a month)
27. Energy used by each inverter per month? (kwh)
28. How many electrical equipment used in different labs (methods that are not included in the above calculations) in the campus? Mentions use (Hours used/day for how many days in a month)
29. How many electrical equipments are available in all labs in the campus?
30. Energy used by all equipments together per month? (kwh)
31. How many heaters used in the canteen of your college? Mention their use (Hours used/day for how many days in a month)
32. Energy used by each heater per month? (kwh)
33. Number of street lights in your college?
34. Energy used by all street lights per month? (kwh)
35. Number of televisions in your college and hostels?
36. Energy used by all TVs per month? (kwh)
37. Any other items that uses energy (Please write the energy used per month) Mention the application (Hours used/day for how many days in a month)
38. Does the camp us have any alternative energy sources/nonconventional energy sources? (photovoltaic cells for solar energy, windmill, energy efficient stoves, etc.,) Specify.
39. Do you run “switch off” drills at college?
40. Are your computers and other equipment put on power-saving mode?
41. Does your machinery (TV, AC, Computer, weighing balance, printers, etc.) run on standby modes most of the time? If yes, how many hours?
42. What are the energy conservation methods adapted by your college?
43. Is there any public awareness systems informing necessity of energy conservation in the campus?
44. Write a note on the methods/practices/adaptations by which you can reduce the energy use in your college campus in future.

Green Auditing of Nirmala College, Muvattupuzha

Questionnaire for Carbon footprint Auditing

1. Total number of students and teachers in your College?

Gender	No of students	No of Teachers	No of non-teaching staff
Male			
Female			
Transgender			
Total			

2. Total Number of vehicles used by the stakeholders of the college/per day.
3. No. of cycles used/day in the campus.
4. No. of two wheelers used (average distance travelled, cc of two wheelers and quantity of fuel and amount used/day). (C.F-Annexure-I).
5. No. of cars used (average distance travelled, power of engine (cc) and quantity of fuel and amount used/day). (C.F-Annexure-II).
6. No. persons using common (public) transportation (average distance travelled and quantity of fuel and amount used/day).
7. No. of persons using college conveyance (general transportation) by the students, non-teaching staff and teachers (average distance travelled and quantity of fuel and amount used per day)
8. Number of parent-teacher meetings in a year? Parents turned up (approx.)
9. Mention their mode of travel and give approximate cost of their commutation.
10. Number of visitors with vehicles per day?
11. Number of generators used/day (hours). Provide quantity and amount for fuel usage/day.
12. Number of LPG cylinders used in the campus. Provide quantity and amount of fuel used /day.
13. Quantity of kerosene used in the canteen/labs (Provide quantity and amount of fuel used per day and amount spent).
14. Amount of taxi/auto charges paid and the amount of fuel used per month for the transportation of vegetables and other materials to the campus.

15. Amount of taxi/auto charges paid per month for the transportation of office goods to the college.
16. Amount of taxi/auto charges paid per month by the stakeholders of the college.
17. Use of any other fossil fuels in the college (Give the amount of fuel used per day and amount spent). (C.F-Annexure-III).
18. What are the methods you might adopt in the future to reduce the quantity of fuel used by the stakeholders/students/teachers/non-teaching staff of the college.

Audited by



Heartian Green Audit Team
Sacred Heart College Thevara
Cochin-13



NIRMALA COLLEGE MUVATTUPUZHA

Ranked on the 91st position among the colleges in India
by the NIRF Rankings 2017 and accredited by NAAC with B++ grade

Muvattupuzha P. O., Ernakulam Dist., Kerala - 686 661
Telephones:0485 2832361, 2836300
e-mail:nirmalacollege@gmail.com, Website: www.nirmalacollege.ac.in





NIRMALA COLLEGE

MUVATTUPUZHA



GENDER AUDIT REPORT 2018-19

PREPARED BY
WOMEN CELL

Gender Audit Report Summary 2018-19

Prepared by

Women Cell

Nirmala College, Muvattupuzha

PREFACE

“Gender equality, equality between men and women...does not mean that women and men have to become the same, but that their rights, responsibilities and opportunities will not depend on whether they were born male or female. Gender equity means fairness of treatment for men and women according to their respective needs. This may include equal treatment or treatment that is different but which is considered equivalent in terms of rights, benefits, obligations, and opportunities.” –United Nations Educational, Scientific and Cultural Organization (UNESDOC)

Gender equity means fairness of treatment for women and men, according to their respective needs. This may include equal treatment or treatment that is different, but which is considered equivalent in terms of rights, benefits, obligations, and opportunities.

Gender Equality is a global issue, and discussions on women’s emancipation and her rights are at the forefront of many worldwide formal and informal campaigns. As the awareness of gender issues increases, women spontaneously take action against women’s oppression and exploitation. Gender awareness allows women to move beyond other conventional gender stereotypes and rigid gender role definitions. The gender audit was conducted to identify ways to make college campus safer for women. The audit process involved choosing the sites to be audited, selecting the participants, orientation to the participants, preparing the checklist and the walk –about, writing down the findings and sharing the results with the principal of the college for implementation of the recommendations.

Dr. Leena Mathews

Dr. Ani Kurian

Ms.Sona George

HOD, Dept. of English

HOD, Dept. of Zoology

Asst. Professor, Dept. of English

Nirmala College, Muvattupuzha

Gender Policy

- There shall not be any kind of discrimination on the basis of Gender
- The institution shall provide equal opportunity for all genders
- Freedom for all genders to express of free and fair opinion
- There must be an accessible, active, unbiased and confidential grievance redressal cell
- The institute shall arrange effective measures for the safety and security of all gender

Objectives of Gender Audit

The Gender Audit has the following objectives:

- To find out the areas where gender imbalance exists and the factors behind it
- To establish good gender balance in decision-making processes in all areas of the college activities.
- To Suggest measures for bridging the gender gap.
- To Foster gender equality in all aspects of college community.
- To see the work and capacity for prevention of sexual harassment at the college

Key Steps in Gender Audit

- Planning
- Field work
- Draft Report
- Final Report

Introduction

Nirmala College is one of the best colleges in Kerala since 1953 . It is also recognized as “Star College” by DBT, Govt. of India. Its mission is to provide quality education to all by means of hard work, dedication and devotion. The Gender Audit is an attempt to study whether the college has good gender balance. It tries to see whether college follows government rules, policies and actions formulated for up-gradation of women in society. The Gender Audit tries to assess the impact of its current and proposed policies on gender equality.

Gender Audit Team reviewed and analysed the operating environment and context of Nirmala college ,Muvattupuzha. From the analysis, the team understood that the college operating in an environment where everyone has access to a full range of opportunities to achieve the social, psychological and physical benefits that come from participating and leading in sports and physical activity. It does not necessarily mean making the same programs and facilities available to both males and females. Gender equity requires that girls and women be provided with a full range of activity and program choices that meet their needs, interests and experiences. Therefore, some activities may be the same as those offered to boys and men, some may be altered, and some may be altogether different.

The college always concentrates on students qualitative performance along with their overall personality development. Observing the gender equality, the girls are provided with various facilities and special attentions. The NCC unit for girls concentrates in developing their characters and qualities like comradeship, discipline, leadership, secular outlook and spirit of adventure. This unit focuses on outstanding achievements of the girls. The NSS has separate unit of girls. The unit always motivates girls for their social responsibilities. Special study room ,waiting room and parking are provided for the girls. They are also given self-defence trainings driving classes in concession rates. The Karate ,Yoga and Meditation trainings are also organized.They are trained for ornament making,cloth bag making and also mushroom cultivation. The lectures of eminent personalities are held on various topics to develop their personalities. Organizing self defence training with the help of Kerala police.

Workshops are held on “Women and Human Rights” and Women and Laws” to make the girls aware of their rights and responsibilities. Girls are made aware of laws and by-laws by organizing lectures of eminent judges, lawyers etc. Anti-ragging Committee and Internal Complaints Committee are formed in the college. These committees arrange lectures of lawyers, social workers to aware the girls for their privileges and duties. In the field of Cultural

Activities and Sports, girls have achieved grand success. Their participation in Youth Festival and various competitions gives name and fame to both to college and to themselves. In the public societal action the college provides classes for parents on parenting issues and also women and Laws. Girls were actively engaged in all the actions taken by college in flood relief actions such as collection and proper distribution of clothes, medicines and utensils. Helps the *kudumbasree* ladies to sell their organic vegetables.

The analysis of the responses of students with regard to programme planning and design in college and its activities revealed that most student members feel that the gender equity in policies, programmes of the college is adequate.

Data Analysis

Table 1: Gender wise Details of Total Students in the College

S.No.	Year	Total	Male	Female	%M	%F
1	2017-18	2654	978	1676	36.85	63.15
2	2018-19	2733	1093	1640	40	60

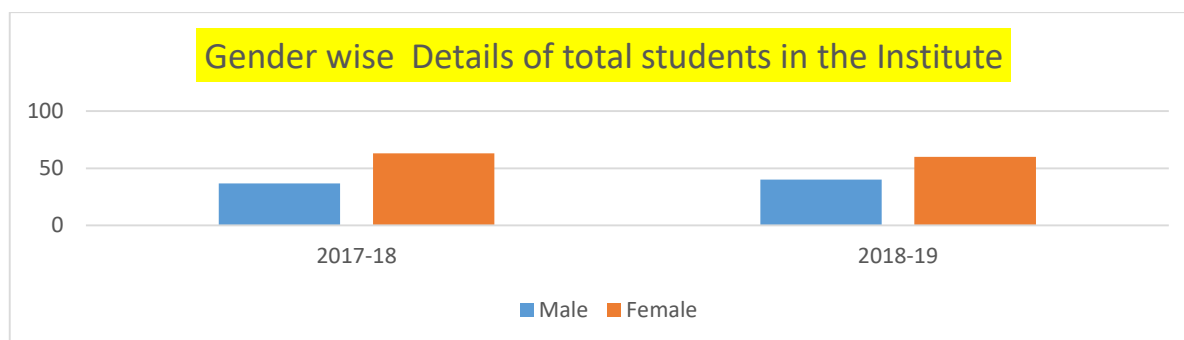


Figure 1: Gender wise Details of Total Students in the College

The table shows year wise gender classification of male and female strength of students and the total number of admissions to the college. It appears that the number of students increased in 2018-19 so there is a slight increase of 3% is found to be there with boy's population as compared to previous year

Table: 2 Gender wise Details of Total Students in Arts Subjects

S.No.	Year	Total	Male	Female	%M	%F
1	2017-18	1068	409	659	38.2	61.7
2	2018-19	1112	464	648	41.7	58.2

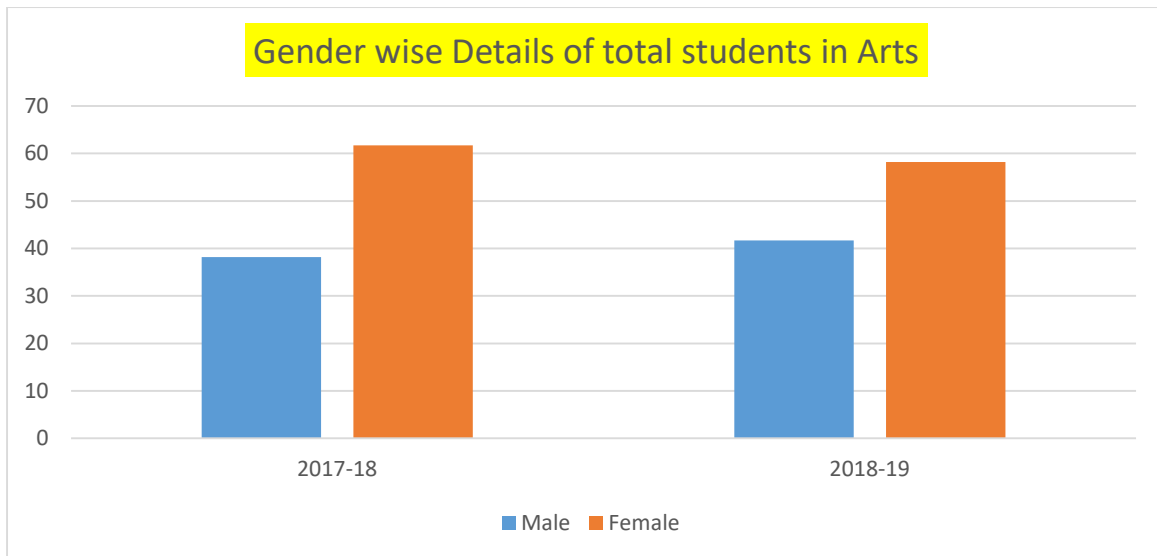


Figure: 2 Gender wise Details of Total Students in Arts Subjects

The 3% increase found in total number of students reflected here also. The number of boys in arts subjects such as Economics, Malayalam, Hindi etc. slightly increased as compared to previous years.

Table: 3 Gender wise Details of total students in Science

S.No.	Year	Total	male	Female	%M	%F
1	2017-18	846	228	618	26.9	73
2	2018-19	867	273	594	31.4	68.5

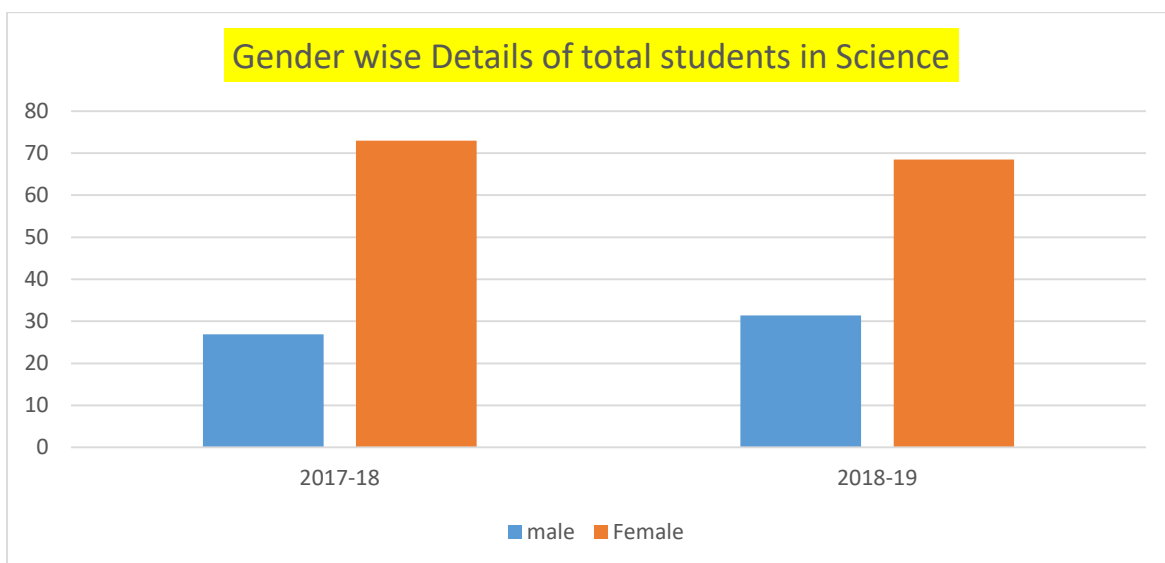


Figure3: Gender wise Details of total students in Science

In science though the number of girls are still more but a decrease is found as compared to previous years.

Table:4 Gender wise Details of total students in commerce

S.No.	Year	Total	male	Female	%M	%F
1	2017-18	659	328	331	49.7	50.2
2	2018-19	668	339	329	50.7	49.2

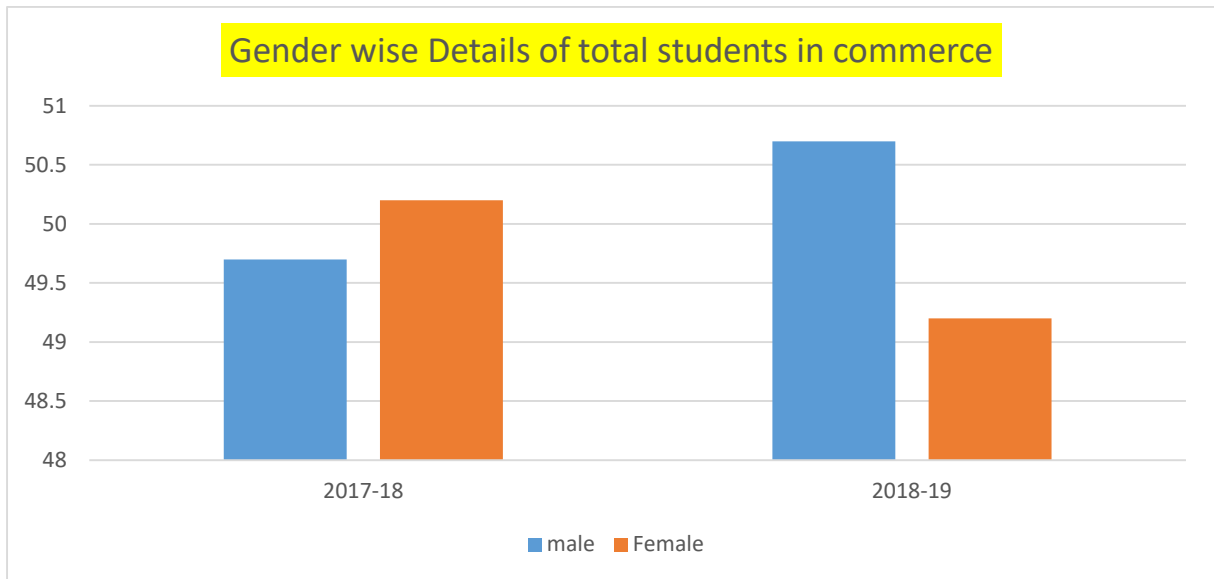


Figure:4 Gender wise Details of total students in commerce

In commerce the total number boys slightly increased. Reduced job opportunity in engineering might be the reason why more boys are turning to arts, science and commerce.

Table:5 Gender wise Details of Teaching staff in College

S.No.	Year	Total	male	Female	%M	%F
1	2017-18	152	58	94	38.1	61.8
2	2018-19	147	53	94	36	63.9

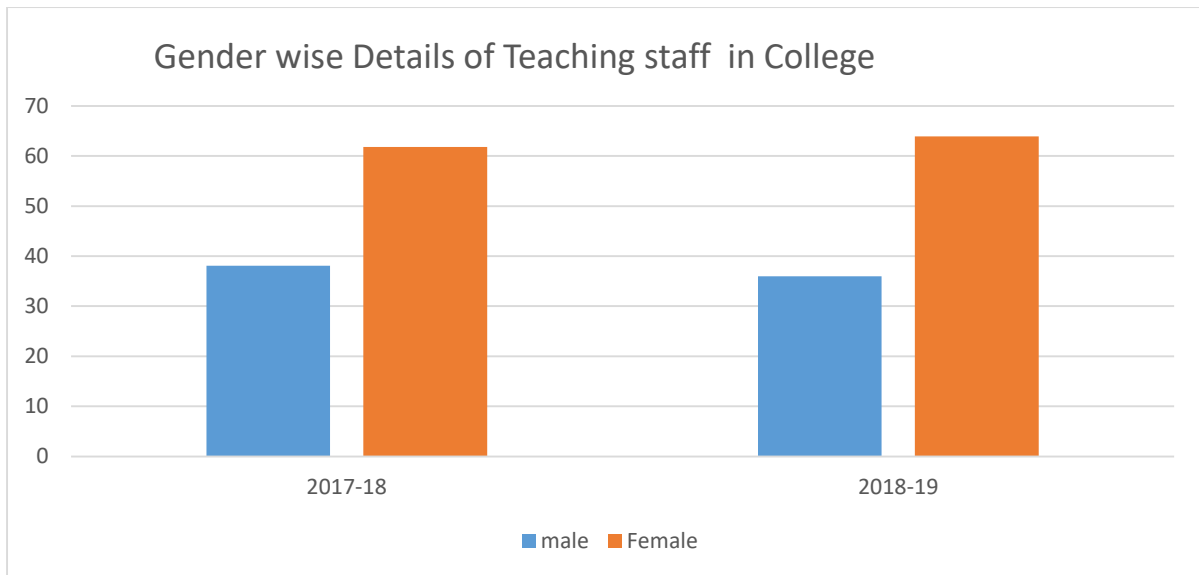


Figure: 5 Gender wise Details of Teaching staff in College

The total number of female teaching staff is more as compares to male. This proves that Kerala women are empowering as time travels. It's also a need of Institution to have more female teachers with more girl students.

Table: 6 Gender wise Details of total HODs in College

S.No.	Year	Total	male	Female	%M	%F
1	2017-18	18	10	8	55.5	44.4
2	2018-19	18	10	8	55.5	44.4

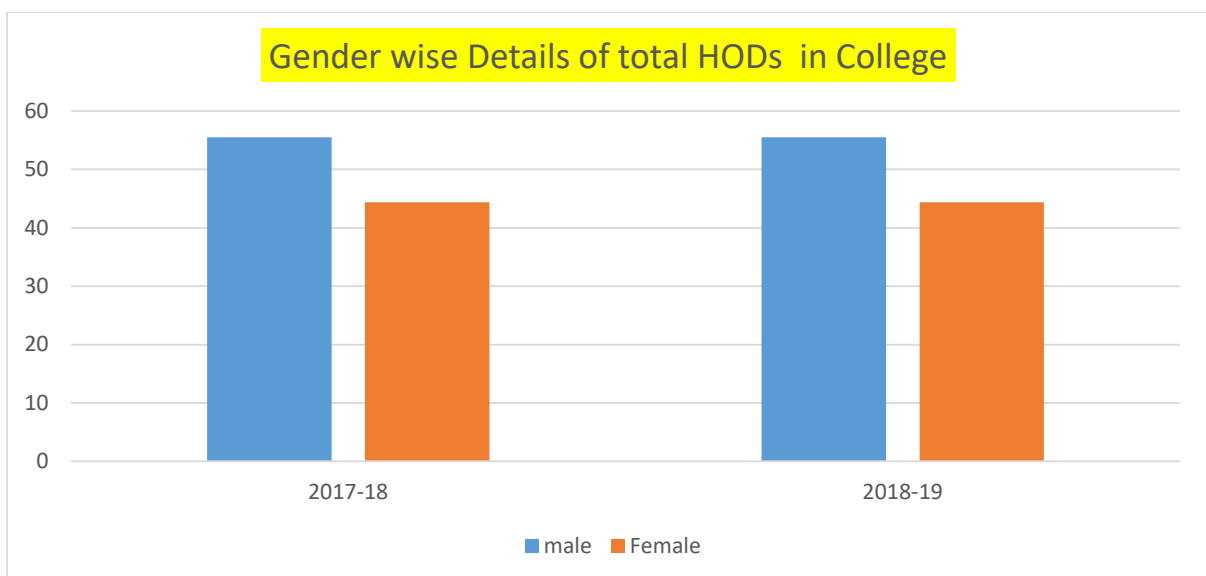


Figure:6 Gender wise Details of total HODs in College

Since two years the ratio is fixed.

Table:7 Gender wise Details of Non-Teaching staff in College

S.No.	Year	Total	male	Female	%M	%F
1	2017-18	58	29	29	50	50
2	2018-19	58	29	29	50	50

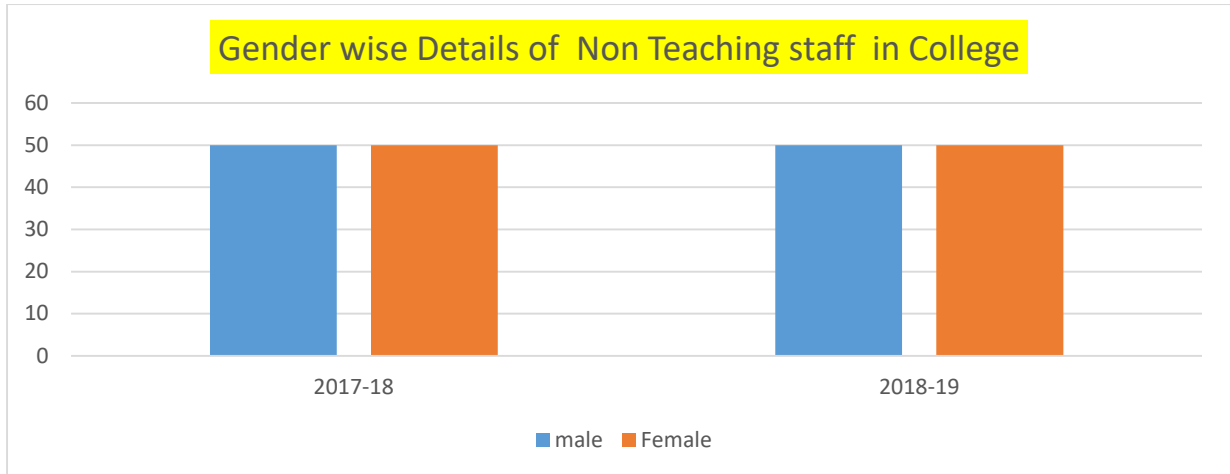


Figure: 7 Gender wise Details of Non-Teaching staff in College

There is a perfect balance between male and female staff.

Table: 8 Gender wise Details of total students in NCC.

S.No.	Year	male	Female
1	2017-18	81	79
2	2018-19	81	79

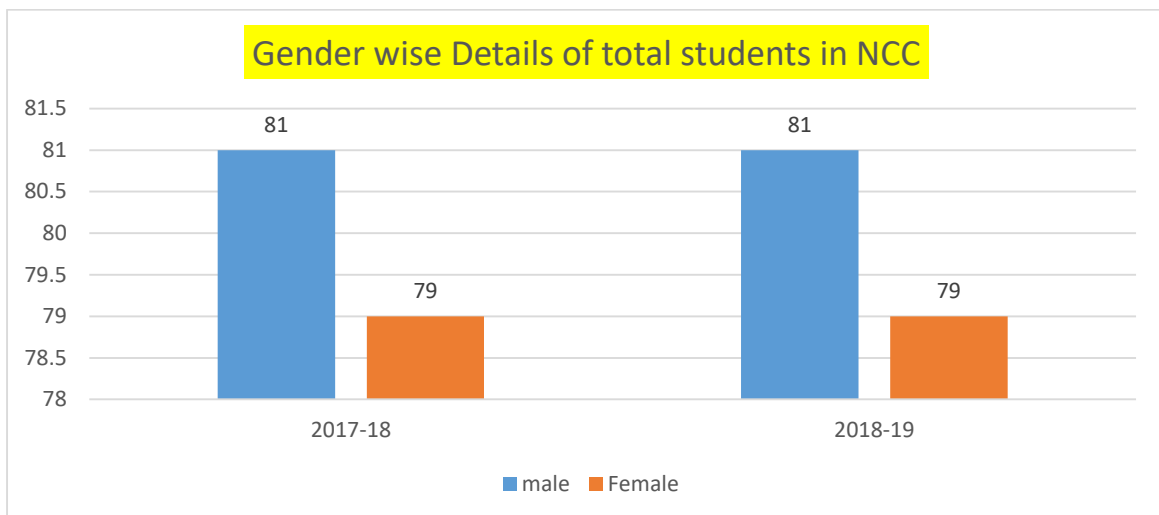


Figure: 8 Gender wise Details of total students in NCC.

The number of students in NCC is fixed and it is always full

Table: 9 Gender wise Details of total students in NSS

S.No.	Year	male	Female
1	2017-18	33	67
2	2018-19	31	69

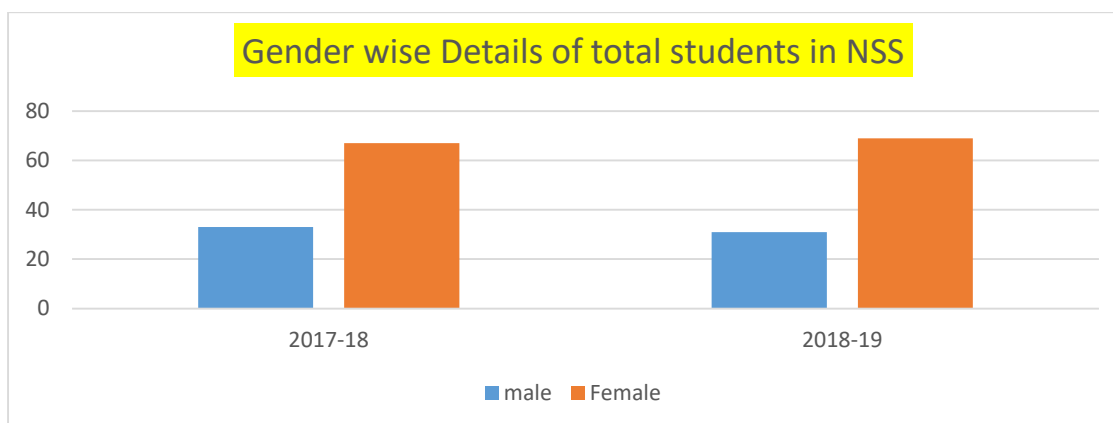


Figure: 9 Gender wise Details of total students in NSS

The number of students are fixed at 100 for each year. The degree final year students are exempted. The selection of NSS volunteers are on the basis of their aptitude towards selfless service to societal actions and also the ability to work in group is also considered. It's a matter of pride to see girls always excel in these activities.

Table:10 Gender wise Details of total Participants in College Arts

S.No.	Year	male	Female
1	2017-18	220	673
2	2018-19	211	598

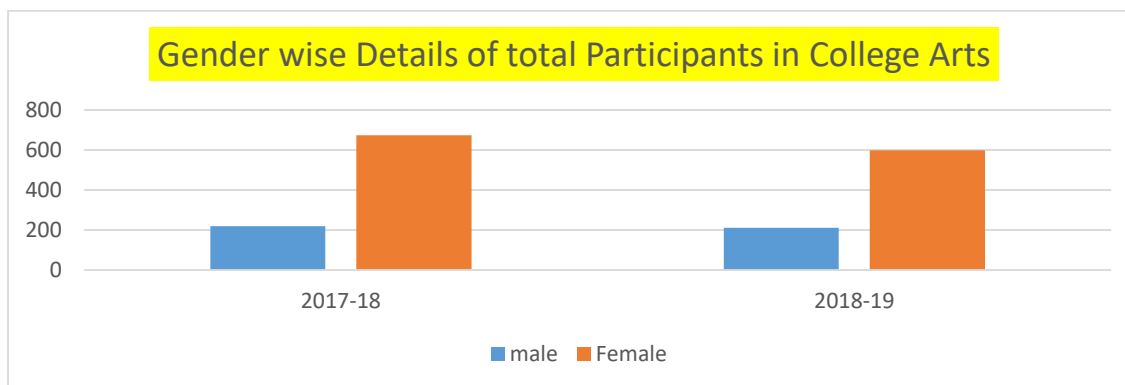


Figure: 10 Gender wise Details of total Participants in College Arts

Girl students always outnumber boys in arts. There are 43 art items conducted for competitions. There are tight competitions for all the items and the best ones out of these represent college in university

Table : 11 Gender wise Details of total Participants in College Sports

S.No.	Year	Male	Female
1	2017-18	320	273
2	2018-19	211	198

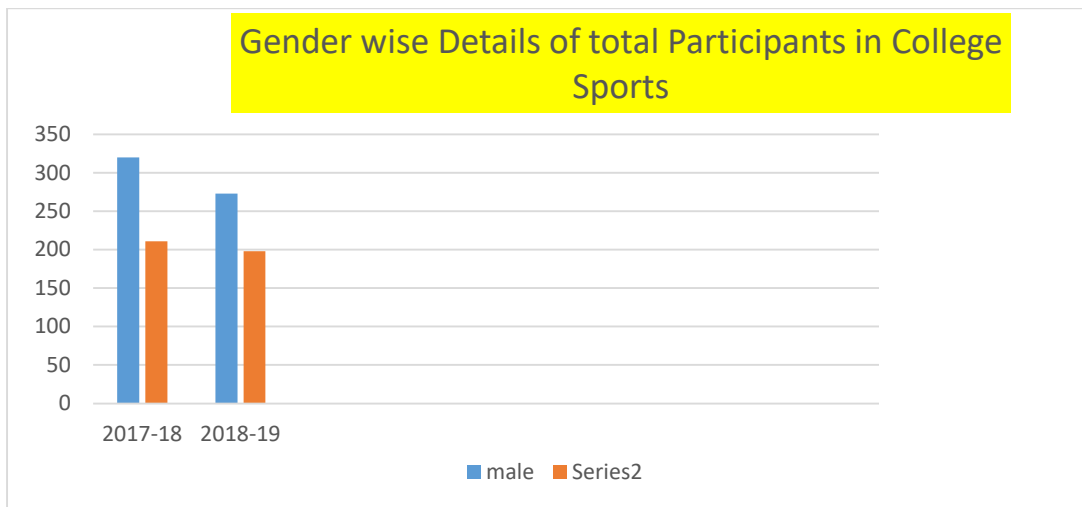
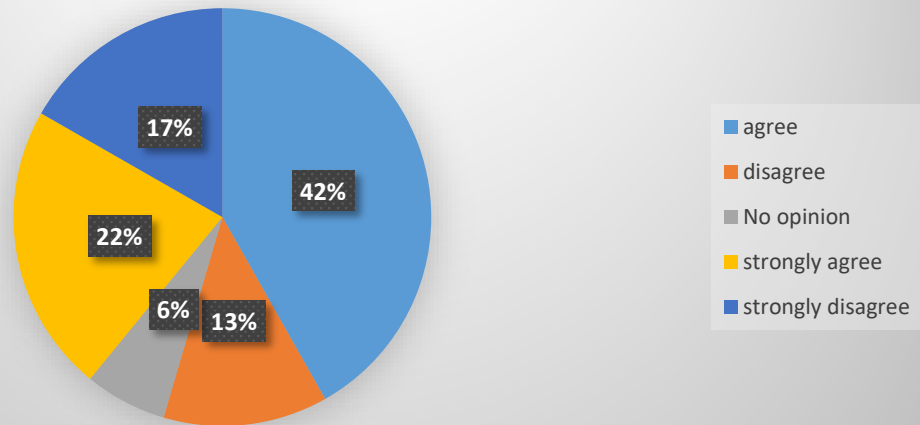


Figure: 11 Gender wise Details of total Participants in College Sports

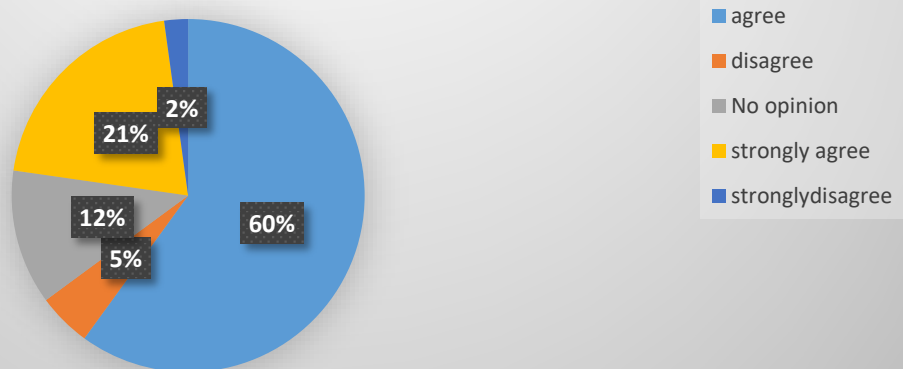
The sports competitions are male dominating. Girls concentrate more on athletics but boys are involved both in athletics and other games too

Number of Survey participants-550

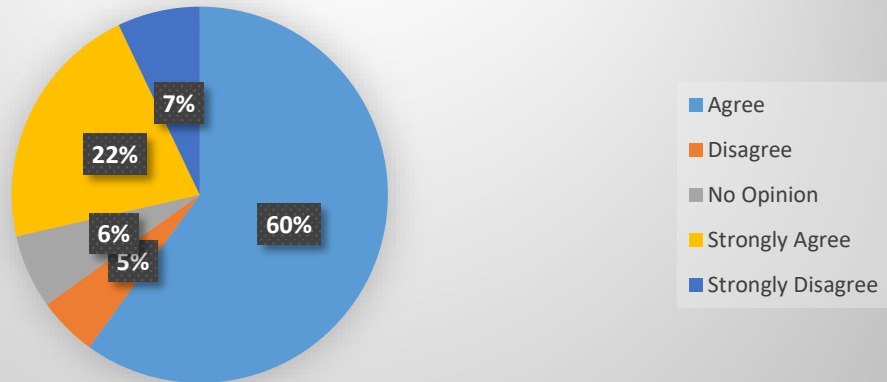
The college conducts gender sensitization program as a part of its curriculum



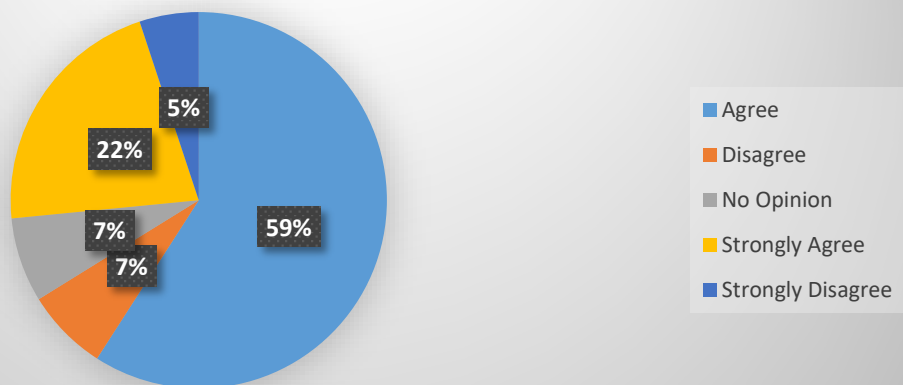
The college conducts gender awareness programs as a part of its curriculum



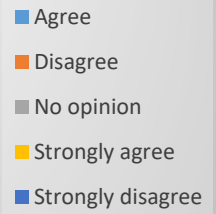
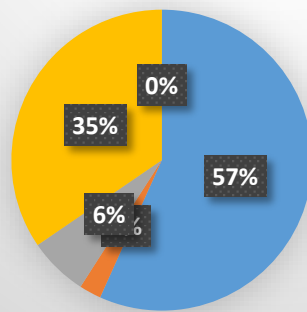
Adequate number of toilets are available in the campus for girls.



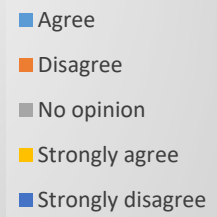
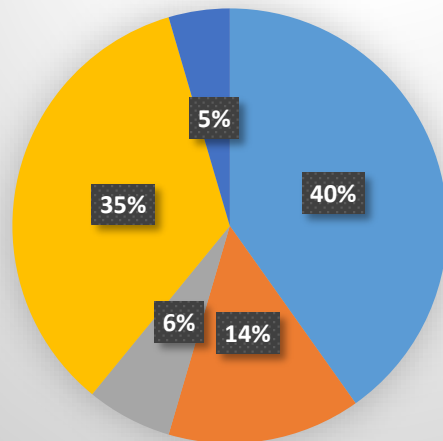
Adequate disposal bins are available in the toilet



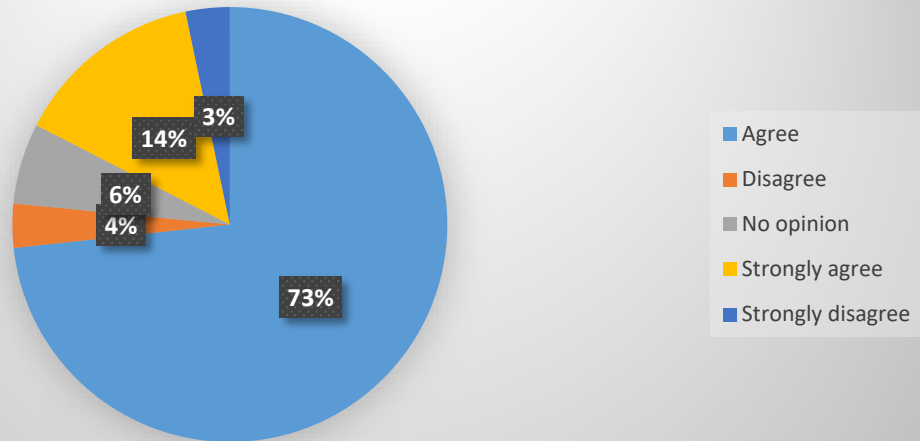
Adequate lighting is available inside the campus during night



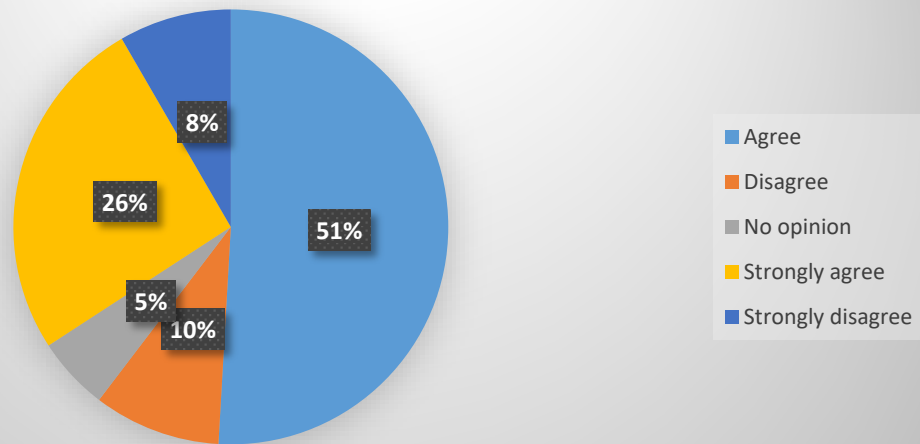
Awareness of Students about Women Cell



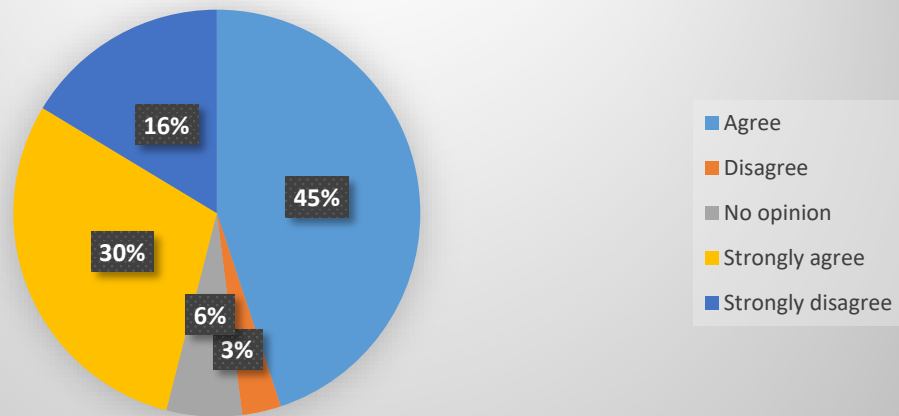
A grievance redresses cell has been set up



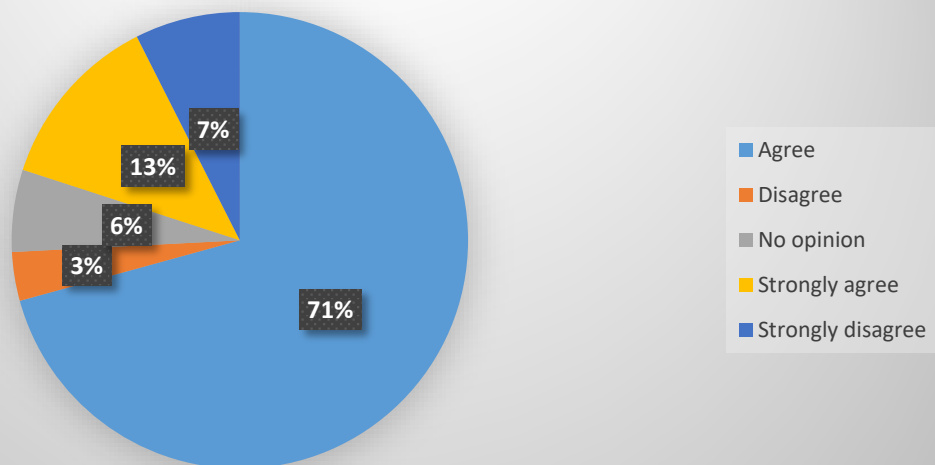
The classroom offers equal opportunities to all



The equal opportunity to all genders to work with various clubs and forums



The equal opportunity to all genders for free and fair expression of ideas



Salient Findings

- Students strength particularly girl's strength is high in both arts and science UG and PG programmes
- Girls enrolment is more than that of boys in most of the classes.
- Success rate of girl students is higher than that of boys.
- The participation of girls in cultural activities is higher than boys
- In sports the participation of boys is more than that of girls.
- In regular teaching staff the strength of females are higher than male

- nonteaching staff have an equal male and female ratio.

Suggestions

- Define and deepen the understanding of gender equality concepts such as gender equity, empowerment of women, men and masculinities
- The number of female staff to decision making bodies may be increased
- Organise more sports programmes on a regular basis.
- More awareness program on Legal rights
- College intends to introduce self-employment trainings in different subjects.
- Improve the marketability of the products made by students

Conclusion

The analysis shows that gender equity goals and objective are included in all the policies, programmes of the college and staff also reported that they have no problems related to gender criterion. Gender Audit Team analyzed that the gender equality and gender sensitivity is encouraged by management and staff of the college and they do have gender sensitive behaviour.

It is found that the College has lots of strengths and some weaknesses. The weaknesses can be overcome with gradual changes in value set up. Doubtless, the enrolment of girls from all section of society is increasing and there is no gender issues complaints . With the strong will power and commitment to gender justice, the College would certainly make a mark in the country.

Format of Questionnaire

	Control objective	Option
1	The college conducts gender sensitization program as a part of its curriculum	Strongly agree
		Agree
		No opinion
		Disagree
		Strongly disagree
2	The college conducts gender awareness programs, such as awareness of sexual harassment, as a part of its curriculum.	Strongly agree
		Agree
		No opinion
		Disagree
		Strongly disagree
3	Adequate number of toilets are available in the campus for girls.	Strongly agree
		Agree
		No opinion
		Disagree
		Strongly disagree
4	Adequate facilities are available inside the toilet keeping in mind the need of the girl students. Adequate disposal bins are available in the toilet	Strongly agree
		Agree
		No opinion
		Disagree
		Strongly disagree
5	Adequate lighting is available inside the campus during night, including but not limited to, adequate light in corridor, class rooms, common areas, toilets etc.	Strongly agree
		Agree
		No opinion
		Disagree
		Strongly disagree
6	Adequate security arrangements have been made in the campus and common areas during day and night.	Strongly agree
		Agree
		No opinion
		Disagree
		Strongly disagree
7	Options for flexible timing is available for girl students. For example, for outside scholars, no class is arranged in late evening or early morning.	Strongly agree
		Agree
		no opinion
		Disagree
		Strongly disagree
8	A women cell is set up in the college and students are aware about the women cell.	Strongly agree
		Agree
		No opinion
		Disagree
		Strongly disagree
9	There are lady faculties available in the women cell.	Strongly agree
		Agree
		no opinion
		Disagree

		Strongly disagree
10	Do you reach out to women's cell?	Strongly agree
		Agree
		No opinion
		Disagree
		Strongly disagree
11	A grievance redresses cell has been set up.	Strongly agree
		Agree
		No opinion
		Disagree
		Strongly disagree
12	The classroom offers equal opportunities to all genders.	Strongly agree
		Agree
		No opinion
		Disagree
		Strongly disagree
13	The college offers equal opportunities to all genders on sports	Strongly agree
		Agree
		No opinion
		Disagree
		Strongly disagree
14	There is equal opportunity to all genders to work with various clubs and forums	Strongly agree
		Agree
		No opinion
		Disagree
		Strongly disagree
15	There is equal opportunity to all genders for free and fair expression of ideas	Strongly agree
		Agree
		No opinion
		Disagree
		Strongly disagree



PRINCIPAL
NIRMALA COLLEGE
MUVATTUPUZHA





NIRMALA COLLEGE MUVATTUPUZHA

Muvattupuzha P. O., Ernakulam Dist., Kerala - 686 661
Telephones: 0485 2832361, 2836300
e-mail: nirmalacollege@gmail.com, Website: www.nirmalacollege.ac.in

FOURTH CYCLE NAAC ACCREDITATION 2019

CRITERION 6

GOVERNANCE, LEADERSHIP AND MANAGEMENT

6.5.2 The institution reviews its teaching learning process, structures & methodologies of operations and learning outcomes at periodic intervals through IQAC set up as per norms

Click here to open Institutional Performance
<http://nirmalacollege.ac.in/insitutional-peformance/>

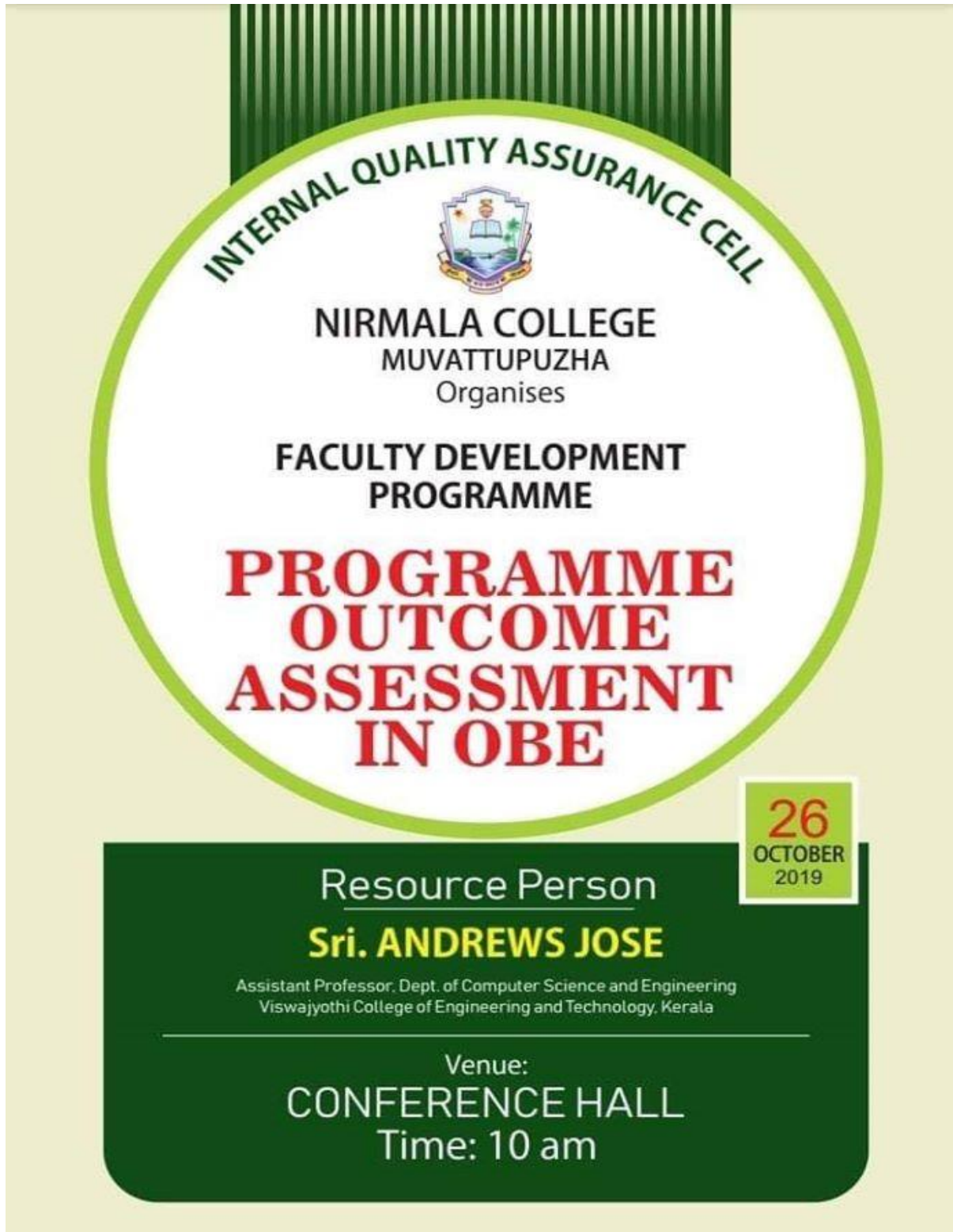
Submitted to



THE NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL




Workshop on OBE



The poster features a central circular emblem with a green border. Inside the circle, the text is arranged from top to bottom: 'INTERNAL QUALITY ASSURANCE CELL' in a curved path, the college crest, 'NIRMALA COLLEGE MUVATTUPUZHA Organises', 'FACULTY DEVELOPMENT PROGRAMME', and 'PROGRAMME OUTCOME ASSESSMENT IN OBE' in large red letters. Below the circle, a dark green banner contains the resource person's name and details, and a date box on the right indicates the event date.

INTERNAL QUALITY ASSURANCE CELL



NIRMALA COLLEGE
MUVATTUPUZHA
Organises

**FACULTY DEVELOPMENT
PROGRAMME**

**PROGRAMME
OUTCOME
ASSESSMENT
IN OBE**

26
OCTOBER
2019

Resource Person
Sri. ANDREWS JOSE
Assistant Professor, Dept. of Computer Science and Engineering
Viswajyothi College of Engineering and Technology, Kerala

Venue:
CONFERENCE HALL
Time: 10 am



Evaluation of Attainment

ISEM ATTAINMENT - Excel

NIRMALA COLLEGE, MUVATTUPUZHA

Department: BCA Program: UG Semester: I No. of Students: 67	No. of POs: 5 No. of PSO's: 6 No. of Courses: 6 Course Code: EN1CCT01-1CRP01-L, C1CRT01-CE, S1CRT02-4, CM103-MQ, CM101-STAT No. of COs: 8, 8, 4, 8, 4, 6
--	--

GENERATE ?

Roll No	Name	EN1CCT01 English		C1CRP01 LAD		C1CRT01 CDP		C1CRT02 C		MM1CM103 MATHS		S11CM101 STAT	
		Int	Ext	Int	Ext	Int	Ext	Int	Ext	Int	Ext	Int	Ext
		20	80	20	80	20	80	20	80	20	80	20	80
170021096691	ABSAK M.MUHAMMAD	13	34	20	63	15	54	15	56	18	55	14	36
170021096692	AGEN THOMAS	12	39	20	65	16	43	17	43	18	68	15	44
170021096693	AJSAI P.A	1	6	12	6	5	6	5	6	5	6	5	6
170021096694	ALEENA BINUY	16	39	17	38	16	50	16	49	18	53	17	60
170021096695	ALEN BENNY	13	41	19	48	13	17	11	17	11	47	11	34
170021096696	ALFIYA ASHARAF	16	43	20	65	18	47	16	56	19	72	16	23
170021096697	ANAL GEORGE	19	68	20	68	18	67	18	57	20	80	18	78
170021096698	AMRUTHA RAJAN	16	31	17	36	14	41	14	40	18	56	14	46
170021096699	KANDATHIKUDIVIL	17	33	17	46	16	36	15	66	18	70	15	66
170021096700	ANJANA ANIL	14	27	20	32	15	44	15	32	14	44	15	33
170021096701	ANSAL JOHNSON	13	40	17	40	17	49	17	34	17	74	15	66
170021096702	ANTO MATHEW	12	34	19	37	13	46	12	38	12	65	11	24
170021096703	APARNA KATHRESH	17	47	17	32	14	62	14	55	17	75	15	45
170021096704	APARNA KJ	14	36	17	35	13	36	13	44	18	46	17	54

ISEM ATTAINMENT - Excel

NIRMALA COLLEGE, MUVATTUPUZHA

Department: BCA Program: UG Semester: II No. of Students: 62	No. of POs: 5 No. of PSO's: 6 No. of Courses: 6 Course Code: C2CRT01-DRMS, C2CRT05-CO, C2CRT06-OOPS, C2CRP02-LAR, EN2CCT03-ENG, MM2CM103-MATHS No. of COs: 8, 4, 7, 7, 8, 4
---	---

GENERATE ?

Roll No	Name	C2CRT01 DRMS		C2CRT05 CO		C2CRT06 OOPS		C2CRP02 LAR		EN2CCT03 ENG		MM2CM103 MATHS	
		Int	Ext	Int	Ext	Int	Ext	Int	Ext	Int	Ext	Int	Ext
		20	80	20	80	20	80	20	80	20	80	20	80
170021096691	ABSAK M.MUHAMMAD	12	36	15	32	13	47	20	59	13	42	12	34
170021096692	AGEN THOMAS	12	49	14	56	13	44	18	42	14	48	17	59
170021096693	ALEENA BINUY	16	44	17	68	17	57	19	63	17	50	19	48
170021096694	ALEN BENNY	9	28	9	26	9	26	13	40	10	49	8	37
170021096695	ALFIYA ASHARAF	15	44	18	68	17	57	19	51	17	47	19	47
170021096696	ANAL GEORGE	16	58	16	72	17	60	19	68	17	51	19	72
170021096697	AMRUTHA RAJAN	14	39	15	43	16	30	17	47	13	30	16	28
170021096699	KANDATHIKUDIVIL	16	55	17	72	18	51	17	54	18	56	15	64
170021096700	ANJANA ANIL	13	39	12	38	14	24	17	33	17	48	14	43
170021096701	ANSAL JOHNSON	13	64	12	50	15	32	18	42	15	46	19	63
170021096702	ANTO MATHEW	9	33	10	35	11	21	16	32	13	39	10	36
170021096703	APARNA KATHRESH	14	40	15	56	14	38	16	43	18	52	16	49
170021096704	APARNA KJ	14	37	14	50	16	42	17	45	14	51	15	37
170021096705	APPUS MURALI	13	40	12	32	14	41	17	46	12	46	12	45

SEM ATTAINMENT - Excel

NIRMALA COLLEGE, MUVATTUPUZHA

Department	BCA	No. of POs	5	<input type="button" value="GENERATE"/>
Program	UG	No. of PSOs	6	
Semester	III	No. of Courses	6	
No. of Students	62	Course Code	ST3CMT32-3CRT07-43CRT01-33CRT02-63CRT08-13CRP03-LAB	
		No. of COs	4 5 3 4 6 5	

Roll No	Name	ST3CMT32 - STATI		CS3CRT07 - CG		CA3CRT01 - MP		CA3CRT02 - OS		CS3CRT08 - DS		CS3CRP03 - LAB	
		Intl	Extl	Intl	Extl	Intl	Extl	Intl	Extl	Intl	Extl	Intl	Extl
		20	80	20	80	20	80	20	80	20	80	20	80
17002109600	ABSAR M MUHAMMED	11	25	14	37	16	30	11	32	16	43	19	75
17002109601	AGEN THOMAS	11	27	15	31	16	39	17	29	16	41	19	40
17002109602	ALEENA BINOY	19	58	18	60	18	33	16	40	18	54	18	43
17002109603	ALEN BENNY	8	0	11	40	11	24	11	0	11	43	14	47
17002109604	ALFIYA ASHARAF	15	52	17	49	18	48	17	40	17	55	17	60
17002109605	AMAL GEORGE	16	65	18	60	19	74	17	56	19	67	20	75
17002109606	AMRUTHA RAJAN	13	27	14	26	15	34	15	34	15	49	16	52
17002109607	ANAND A SHIBULHADITH	16	57	15	59	18	52	12	56	17	58	15	51
17002109608	ANJANA ANIL	13	40	15	48	17	25	14	34	16	53	16	48
17002109609	ANSAL JOHNSON	11	46	15	59	17	33	13	37	15	57	16	32
17002109610	ANTO MATHEW	10	0	12	38	11	0	11	24	12	42	17	40
17002109611	APARNA SATHEESH	11	30	17	54	18	39	15	39	16	49	16	43
17002109612	APARNA KJ	15	33	16	43	17	43	14	36	16	54	17	32
17002109613	APPUN MIRAJI	13	50	15	47	15	47	12	35	14	47	12	50

SEM ATTAINMENT - Excel

NIRMALA COLLEGE, MUVATTUPUZHA

Department	BCA	No. of POs	5	<input type="button" value="GENERATE"/>
Program	UG	No. of PSOs	6	
Semester	IV	No. of Courses	6	
No. of Students	62	Course Code	MM4CMT03-4CRT09-D44CRT03-3CRT10-LI4CRT11-P4CRP04-LAB	
		No. of COs	4 5 6 5 6 8	

Roll No	Name	MM4CMT03 - OR		CS4CRT09 - DAA		CA4CRT03 - SE		CS4CRT10 - LINUX		CS4CRT11 - PHP		CS4CRP04 - LAB	
		Intl	Extl	Intl	Extl	Intl	Extl	Intl	Extl	Intl	Extl	Intl	Extl
		20	80	20	80	20	80	20	80	20	80	20	80
170021096691	ABSAR M MUHAMMED	13	41	14	35	12	26	15	38	17	25	17	60
170021096692	AGEN THOMAS	14	55	14	37	14	37	15	34	17	25	18	58
170021096694	ALEENA BINOY	16	70	18	51	16	40	16	41	18	34	19	70
170021096695	ALEN BENNY	11	64	12	34	10	37	12	43	14	32	15	50
170021096696	ALFIYA ASHARAF	18	68	19	51	17	48	17	42	18	44	18	58
170021096697	AMAL GEORGE	18	73	19	72	16	48	18	62	19	63	19	76
170021096698	AMRUTHA RAJAN	15	64	15	43	14	24	15	31	17	29	17	50
170021096699	ANAND A SHIBULHADITH	15	78	17	61	12	51	17	41	17	40	18	58
170021096700	ANJANA ANIL	14	69	18	54	16	50	16	50	17	40	17	55
170021096701	ANSAL JOHNSON	15	72	17	57	14	41	16	49	18	39	19	55
170021096702	ANTO MATHEW	6	55	5	33	6	29	12	24	12	18	13	53
170021096703	APARNA SATHEESH	14	69	16	56	14	50	15	50	17	37	19	55
170021096704	APARNA KJ	16	66	19	60	17	39	17	51	19	44	19	50
170021096705	APPUN MIRAJI	15	71	15	51	13	27	15	41	15	37	17	45

P8

NIRMALA COLLEGE, MUVATTUPUZHA

Department	Malayalam
Program	BA Malayalam
Semester	I
No. of Students	34

No. of POs	6
No. of PSOs	5
No. of Courses	6
Course Code	ML1CCT01 ML1CRT01 ML1CMT01 ML1CMT02 EN1CCT01 EN1CCT02
No. of COs	5 5 5 5 5 5

GENERATE ?

Roll No	Name	ML1CCT01		ML1CRT01		ML1CMT01		ML1CMT02		EN1CCT01		EN1CCT02	
		Intl	Extl	Intl	Extl	Intl	Extl	Intl	Extl	Intl	Extl	Intl	Extl
		20	80	20	80	20	80	20	80	20	80	20	80
6842	ANU RAJ	13	55	10	44	12	44	13	50	12	28	10	30
6803	ANANDHU K S	15	44	14	49	12	50	15	38	12	36	14	34
6804	ARYA REGHU	18	72	18	70	18	73	18	74	15	42	16	36
6805	BELBIN JOSE	16	60	15	57	16	34	16	51	14	43	12	40
6806	BBIN GEORGE	17	69	16	62	16	45	16	29	15	41	15	59
6808	GETHIN VENU	6	0	6	0	7	0	5	0	8	13	4	0
6809	JINO JOSEPH	13	47	11	48	12	40	12	44	12	39	7	34
6811	VINEESH TB	14	50	8	27	12	37	13	39	12	32	9	28
6812	AMRITHA SURESH	17	61	16	58	17	47	17	58	15	34	16	45
6813	AMRUTHA P NAIR	18	64	16	52	16	42	16	51	16	33	16	48
6814	ANJALY HARI	9	26	8	4	10	5	11	10	11	10	9	0
6815	ANJANA PC	17	72	16	77	18	72	18	73	15	45	15	44
6816	ANJANA PRASAD	18	68	15	61	18	51	18	60	14	32	12	24
6817	ANUTHA JOSE	18	78	15	61	19	65	16	61	17	27	16	48

K18

NIRMALA COLLEGE, MUVATTUPUZHA

Department	Physics
Program	Physics Model I
Semester	II
No. of Students	39

No. of POs	5
No. of PSOs	4
No. of Courses	8
Course Code	EN2CC01 EN2CC04 ML2CCT01 PH2CRP01 PH2CRT01 CH2CRP01 CH2CRT01 3M2CMT01
No. of COs	3 4 5 3 5 2 2 4

GENERATE ?

Roll No	Name	EN2CC01		EN2CC04		ML2CCT01		PH2CRP01		PH2CRT01		CH2CRP01		CH2CRT01		3M2CMT01	
		Intl	Extl	Intl	Extl	Intl	Extl	Intl	Extl	Intl	Extl	Intl	Extl	Intl	Extl	Intl	Extl
		20	80	20	80	20	80	10	40	15	60	10	40	15	60	20	80
1	AATHERA NS	18	50	18	53	18	73	10	39	14	57	10	39	15	58	20	59
2	ABHIRAM MANOJ	16	45	14	36	15	43	9	34	9	24	10	38	11	34	14	2
3	ABENS P SANTO	15	38	16	36	17	60	10	37	13	45	10	38	13	60	18	74
4	ADHIL JABBAR	9	26	9	27	8	36	7	34	6	14	0	28	5	30	7	10
5	AHSANA U ABU	19	62	11	34	14	48	9	35	14	39	9	35	11	41	16	38
6	ALEENA DOMINIC	16	58	16	62	16	56	9	38	12	47	10	38	14	45	17	49
7	AMRITHA PV	17	59	18	59	18	72	10	39	13	46	16	37	14	60	19	78
8	ANAINA SULAIMAN	18	57	19	69	19	74	10	36	14	48	10	40	15	59	18	57
9	ANAMIKA TR	14	24	14	55	15	60	7	33	7	23	9	40	11	43	9	26
10	ANUJA ROSE SAJU	16	24	15	24	17	58	10	37	10	3	10	37	13	37	14	52
11	ASHITHA THANKACHAN	16	27	17	42	17	70	0	28	12	18	10	33	14	39	15	45
12	ASHLIN ISSAC	13	48	13	30	13	71	8	32	7	11	9	31	9	41	7	28
13	ASMA BEEVI TE	17	62	18	63	18	70	10	40	14	34	10	37	15	56	19	78
14	ASWATHY VR	15	33	14	27	16	64	10	33	9	18	10	34	11	20	12	24
15	ASWIN THAMPI	12	37	8	13	13	30	7	34	6	7	9	30	7	8	8	1

M7 4

NIRMALA COLLEGE, MUVATTUPUZHA



Department	Physics
Program	PHYSICS MODEL I
Semester	I
No: of Students	39

No: of POs	5
No: of PSOs	4
No: of Courses	6
Course Code	EN1CC01
No: of COs	5



EN1CC01	EN1CC02	ML1CCT01	PH1CRT01	CH1CMT01	MM1CMT01
5	5	4	5	4	4

Roll No	Name	EN1CC01		EN1CC02		ML1CCT01		PH1CRT01		CH1CMT01		MM1CMT01	
		Intl	Extl	Intl	Extl	Intl	Extl	Intl	Extl	Intl	Extl	Intl	Extl
		20	80	20	80	20	80	15	60	15	60	20	80
		5	28	5	28	5	28	4	20	4	20	5	28
1	AATHIRA N S	16	58	17	55	18	67	13	55	13	45	16	76
2	ABHIRAM MANOJ	16	51	18	44	17	51	10	46	11	32	13	45
3	ABINS P SANTO	18	55	17	48	18	60	14	60	15	56	20	75
4	ADHIL JABBAR	14	35	8	35	15	34	9	29	9	20	9	38
5	AFSANA C ABU	14	51	15	49	15	55	11	42	12	40	15	67
6	ALEENA DOMINIC	16	54	15	59	18	43	12	48	13	46	18	77
7	AMRITHA PV	18	74	18	57	19	77	14	47	14	54	19	72
8	ANAINA SULAIMAN	19	77	18	65	19	70	13	50	14	58	17	80
9	ANAMIKA T R	16	44	11	57	16	67	9	36	10	45	10	47
10	ANUJA ROSE SAJU	14	31	15	55	16	65	9	23	10	18	12	32
11	ASHITHA THANKACHAN	17	42	16	57	18	74	11	43	13	45	14	65
12	ASHLIN ISSAC	15	38	15	51	17	70	10	26	11	38	11	38
13	ASMA BEEVI T E	17	51	17	54	18	77	14	50	14	53	16	78
14	ASWATHY VR	12	28	16	54	13	53	9	6	9	24	10	13


Marks Mapping Output

Attain Consolidated- Sem III - Excel

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW FONT PDF

O34

A B C D E F G H I J K L M N O P Q R

1  **NIRMALA COLLEGE, MUVATTUPUZHA**

2

3

Department	Physics
Program	PHYSICS MODEL 1
Semester	III
No. of Students	39

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

33

34

35

36

37

38

39

40

41

42

43

44

45

46

47

48

49

50

51

52

53

54

55

56

57

58

59

60

61

62

63

64

65

66

67

68

69

70

71

72

73

74

75

76

77

78

79

80

81

82

83

84

85

86

87

88

89

90

91

92

93

94

95

96

97

98

99

100

101

102

103

104

105

106

107

108

109

110

111

112

113

114

115

116

117

118

119

120

121

122

123

124

125

126

127

128

129

130

131

132

133

134

135

136

137

138

139

140

141

142

143

144

145

146

147

148

149

150

151

152

153

154

155

156

157

158

159

160

161

162

163

164

165

166

167

168

169

170

171

172

173

174

175

176

177

178

179

180

181

182

183

184

185

186

187

188

189

190

191

192

193

194

195

196

197

198

199

200

201

202

203

204

205

206

207

208

209

210

211

212

213

214

215

216

217

218

219

220

221

222

223

224

225

226

227

228

229

230

231

232

233

234

235

236

237

238

239

240

241

242

243

244

245

246

247

248

249

250

251

252

253

254

255

256

257

258

259

260

261

262

263

264

265

266

267

268

269

270

271

272

273

274

275

276

277

278

279

280

281

282

283

284

285

286

287

288

289

290

291

292

293

294

295

296

297

298

299

300

301

302

303

304

305

306

307

308

309

310

311

312

313

314

315

316

317

318

319

320

321

322

323

324

325

326

327

328

329

330

331

332

333

334

335

336

337

338

339

340

341

342

343

344

345

346

347

348

349

350

351

352

353

354

355

356

357

358

359

360

361

362

363

364

365

366

367

368

369

370

371

372

373

374

375

376

377

378

379

380

381

382

383

384

385

386

387

388

389

390

391

392

393

394

395

396

397

398

399

400

401

402

403

404

405

406

407

408

409

410

411

412

413

414

415

416

417

418

419

420

421

422

423

424

425

426

427

428

429

430

431

432

433

434

435

436

437

438

439

440

441

442

443

444

445

446

447

448

449

450

451

452

453

454

455

456

457

458

459

460

461

462

463

464

465

466

467

468

469

470

471

472

473

474

475

476

477

478

479

480

481

482

483

484

485

486

487

488

489

490

491

492

493

494

495

496

497

498

499

500

501

502

503

504

505

506

507

508

509

510

511

512

513

514

515

516

517

518

519

520

521

522

523

524

525

526

527

528

529

530

531

532

533

534

535

536

537

538

539

540

541

542

543

544

545

546

547

548

549

550

551

552

553

554

555

556

557

558

559

560

561

562

563

564

565

566

567

568

569

570

571

572

573

574

575

576

577

578

579

580

581

582

583

584

585

586

587

588

589

590

591

592

593

594

595

596

597

598

599

600

601

602

603

604

605

606

607

608

609

610

611

612

613

614

615

616

617

618

619

620

621

622

623

624

625

626

627

628

629

630

631

632

633

634

635

636

637

638

639

640

641

642

643

644

645

646

647

648

649

650

651

652

653

654

655

656

657

658

659

660

661

662

663

664

665

666

667

668

669

670

671

672

673

674

675

676

677

678

679

680

681

682

683

684

685

686

687

688

689

690

691

692

693

694

695

696

697

698

699

700

701

702

703

704

705

706

707

708

709

710

711

712

713

714

715

716

717

718

719

720

721

722

723

724

725

726

727

728

729

730

731

732

733

734

735

736

737

738

739

740

741

742

743

744

745

746

747

748

749

750

751

752

753

754

755

756

757

758

759

760

761

762

763

764

765

766

767

768

769

770

771

772

773

774

775

776

777

778

779

780

781

782

783

784

785

786

787

788

789

790

791

792

793

794

795

796

797

798

799

800

801

802

803

804

805

806

807

808

809

810

811

812

813

814

815

816

817

818

819

820

821

822

823

824

825

826

827

828

829

830

831

832

833

834

835

836

837

838

839

840

841

842

843

844

845

846

847

848

849

850

851

852

853

854

855

856

857

858

859

860

861

862

863

864

865

866

867

868

869

870

871

872

873

874

875

876

877

878

879

880

881

882

883

884

885

886

887

888

889

890

891

892

893

894

895

896

897

898

899

900

901

902

903

904

905

906

907

908

909

910

911

912

913

914

915

916

917

918

919

920

921

922

923

924

925

926

927

928

929

930

931

932

933

934

935

936

937

938

939

940

941

942

943

944

945

946

947

948

949

950

951

952

953

954

955

956

957

958

959

960

961

962

963

964

965

966

967

968

969

970

971

972

973

974

975

976

977

978

979

980

981

982

983

984

985

986

987

988

989

990

991

992

993

994

995

996

997

998

999

1000


Marks Mapping Output

Attain Consolidated(Template v1)Malayalam 4th Sem B.A - Excel

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW FONT PDF

F12

A B C D E F G H I J K L M N O P Q R

1  **NIRMALA COLLEGE, MUVATTUPUZHA**

2

3

Department	Malayalam
Program	B.A Malayalam
Semester	IV
No. of Students	34

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

33

34

35

36

37

38

39

40

41

42

43

44

45

46

47

48

49

50

51

52

53

54

55

56

57

58

59

60

61

62

63

64

65

66

67

68

69

70

71

72

73

74

75

76

77

78

79

80

81

82

83

84

85

86

87

88

89

90

91

92

93

94

95

96

97

98

99

100

101

102

103

104

105

106

107

108

109

110

111

112

113

114

115

116

117

118

119

120

121

122

123

124

125

126

127

128

129

130

131

132

133

134

135

136

137

138

139

140

141

142

143

144

145

146

147

148

149

150

151

152

153

154

155

156

157

158

159

160

161

162

163

164

165

166

167

168

169

170

171

172

173

174

175

176

177

178

179

180

181

182

183

184

185

186

187

188

189

190

191

192

193

194

195

196

197

198

199

200

201

202

203

204

205

206

207

208

209

210

211

212

213

214

215

216

217

218

219

220

221

222

223

224

225

226

227

228

229

230

231

232

233

234

235

236

237

238

239

240

241

242

243

244

245

246

247

248

249

250

251

252

253

254

255

256

257

258

259

260

261

262

263

264

265

266

267

268

269

270

271

272

273

274

275

276

277

278

279

280

281

282

283

284

285

286

287

288

289

290

291

292

293

294

295

296

297

298

299

300

301

302

303

304

305

306

307

308

309

310

311

312

313

314

315

316

317

318

319

320

321

322

323

324

325

326

327

328

329

330

331

332

333

334

335

336

337

338

339

340

341

342

343

344

345

346

347

Attain Consolidated(Template v1)Malayalam 3rd Sem BA - Excel

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW FOXIT PDF

M6 | fx | EN3CCT05

A B C D E F G H I J K L M N O P Q R

NIRMALA COLLEGE, MUVATTUPUZHA

Department	Malayalam
Program	B.A Malayalam
Semester	III
No. of Students	34

No. of POs	6
No. of PSO's	5
No. of Courses	5
Course Code	ML3CCT03 ML3CRT03 ML3CMT03 SC3CMT01 EN3CCT05
No. of COs	5 5 5 5 5

GENERATE ?

Roll No	Name	ML3CCT03		ML3CRT03		ML3CMT03		SC3CMT01		EN3CCT05	
		Intl	Extl	Intl	Extl	Intl	Extl	Intl	Extl	Intl	Extl
		20	80	20	80	20	80	20	80	20	80
40	40	40	40	40	40	40	40	40	40	40	40
6842	ANU RAJ	12	36	12	60	16	60	12	26	10	25
6803	ANANDHU K.S	18	32	12	64	16	62	17	35	10	25
6804	ARYA REGHU	20	67	19	64	19	75	19	67	15	39
6805	BELBIN JOSE	17	41	14	61	17	67	16	58	12	24
6806	BIBIN GEORGE	17	52	15	62	18	63	17	28	15	24
6808	GITHEN VENU	6	0	7	0	10	0	10	4	6	1
6809	JINO JOSEPH	19	47	16	60	19	59	19	37	15	29
6811	VINEESH TB	9	35	7	33	11	63	12	25	6	8
6812	AMRUTHA SURESH	18	47	16	51	17	73	18	51	14	47
6813	AMRUTHA P NAIR	18	43	14	46	18	72	19	49	14	41
6814	ANJALY HARI	12	39	11	30	14	30	14	41	10	12
6815	ANJANA PC	19	60	19	64	20	72	19	68	16	42
6816	ANJANA PRASAD	18	56	18	51	18	66	18	44	13	27
6817	ANITHA JOSE	19	55	18	64	19	65	19	65	16	26

Marks Mapping Output Sheet1

Attain Consolidated(Template v1)Malayalam 2nd Sem BA - Copy (2) - Excel

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW FOXIT PDF

H101 | fx |

A B C D E F G H I J K L M N O P Q R S T U

NIRMALA COLLEGE, MUVATTUPUZHA

Department	Malayalam
Program	B.A Malayalam
Semester	II
No. of Students	34

No. of POs	6
No. of PSO's	5
No. of Course	6
Course Code	ML2CCT02 ML2CRT02 ML2CMT03 ML2CMT04 EN2CCT03 EN2CCT04
No. of COs	5 5 5 5 5 5

GENERATE ?

Roll No	Name	ML2CCT02		ML2CRT02		ML2CMT03		ML2CMT04		EN2CCT03		EN2CCT04	
		Intl	Extl	Intl	Extl	Intl	Extl	Intl	Extl	Intl	Extl	Intl	Extl
		20	80	20	80	20	80	20	80	20	80	20	80
40	40	40	40	40	40	40	40	40	40	40	40	40	40
6842	ANU RAJ	17	58	12	50	17	46	14	53	11	24	12	24
6803	ANANDHU K.S	12	52	7	49	11	65	11	63	7	20	7	16
6804	ARYA REGHU	19	72	18	67	19	74	19	71	16	42	16	24
6805	BELBIN JOSE	18	56	15	45	17	59	18	46	14	31	13	12
6806	BIBIN GEORGE	18	42	13	37	15	44	16	42	15	55	13	7
6808	GITHEN VENU	7	0	5	1	3	1	1	0	1	0	6	0
6809	JINO JOSEPH	10	48	11	52	11	41	10	52	9	26	7	0
6811	VINEESH TB	11	52	6	35	9	43	9	35	5	6	6	6
6812	AMRUTHA SURESH	18	58	16	66	19	74	18	46	17	34	15	49
6813	AMRUTHA P NAIR	18	52	14	46	19	54	17	32	16	32	13	39
6814	ANJALY HARI	12	8	11	19	13	3	12	2	11	2	10	3
6815	ANJANA PC	19	70	17	77	19	70	19	73	16	52	16	47
6816	ANJANA PRASAD	16	45	11	73	16	42	16	47	11	37	0	15

Marks Mapping Output Sheet1





NIRMALA COLLEGE MUVATTUPUZHA

Muvattupuzha P. O., Ernakulam Dist., Kerala - 686 661
Telephones: 0485 2832361, 2836300
e-mail: nirmalacollege@gmail.com, Website: www.nirmalacollege.ac.in

FOURTH CYCLE NAAC ACCREDITATION 2019

CRITERION 6

GOVERNANCE, LEADERSHIP AND MANAGEMENT

6.5.2 The institution reviews its teaching learning process, structures & methodologies of operations and learning outcomes at periodic intervals through IQAC set up as per norms

Click here to open Learning Outcomes
<http://nirmalacollege.ac.in/learning-outcomes-2/>

Submitted to



THE NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL



ZL010204 MICROBIOLOGY AND BIOTECHNOLOGY

54 Hours (18+27) (3hrs/week)

Credit- 3

Objectives:

- To provide an over view of the microbial world, its structure and function
- To understand the fundamental aspects of the basic biology of bacteria and viruses
- To give students an intensive and in-depth learning in the field of biotechnology
- To familiarize the student with emerging field of biotechnology
- To understand the modern biotechnology practices and approaches with an emphasis in technology application, medical, industrial, environmental and agricultural areas and nanomedicine
- To familiarize the students with public policy, biosafety, and intellectual property rights issues related to biotechnology

MICROBIOLOGY

18hrs

Module I

(10hrs)

General Characters and Classification of microbes

General characters of microorganisms- bacteria, virus, fungi, Outline classification of microorganisms (4 hrs)

Functional Anatomy of Prokaryotic Cells - Cell structure, plasma membrane, cytoskeleton, cytoplasm, nucleoid, cytoplasmic inclusions. The prokaryotic cell envelope, peptidoglycan structure, gram positive and negative cell walls. Components outside the cell wall: capsules, slime layers, pili and fimbriae, flagella and motility.

Methods in Microbiology

Culture medium, methods of isolation, pure culture techniques, microbial strain identification – cultural and biochemical, Control of microorganism- physical, chemical and antimicrobial agents. (6 hrs)

Module II

Microbial Growth and Interactions

(8 hrs)

Nutrient requirements, growth factors, uptake of nutrients by the cell. Growth curve. Physical requirements for bacterial growth and influence of environmental factors on growth. Microbes in nutrient cycling.

Symbiosis, commensalism. Mutualism between microbes, microbes and plants, microbes and animals. Cooperation, competition, predation, antagonism. Parasitism, plant parasites, animal parasites. Microbial communication system- Quorum sensing, Biofilms.

BIOTECHNOLOGY

36 hrs.

Module III

Recombinant DNA Technology - Tools and Techniques

(12 hrs)

Introduction – rDNA and cloning, Restriction enzymes and DNA modifying enzymes.

Vectors: cloning and expression vectors - Plasmids, Ti and Ri plasmids, cosmids, phagemids, bacteriophage, SV40, vectors with combination features; PUC19 and Bluescript vectors, shuttle vectors, viral vectors, BAC and YAC vectors. Adaptors, Linkers

Methods of gene transfer: chemical transfection methods: calcium chloride, PEG, polyplex, DEAE dextran. Physical methods: electroporation, microinjection, particle bombardment, ultrasonication, liposome mediated transfer. Biological methods: use of vectors, Selection and screening of recombinants, insertional activation- blue white screening, Generation of cDNA and genomic library.

Basic techniques in Biotechnology

Polymerase chain Reaction- different types and applications, Gene cloning, Chromosome walking, chromosome jumping, DNA foot printing.

DNA sequencing methods- Maxam and Gilberts chemical degradation method, Sanger and Coulson method, Automated DNA sequencers.

Protein sequencing methods

Module IV

Animal Biotechnology and health care

(12 hrs)

Cell and Tissue culture: Basic techniques of mammalian cell culture Growth media- types, biology and characterization of cultured cells. Measurement of viability and cytotoxicity, organ culture.

Cryopreservation and maintenance of cell line

Transgenic animals – production and its applications. Gene knockout and gene knock, Site directed mutagenesis, molecular chimeras

Gene therapy: Exvivo, Invivo, Insitu- Cell and tissue engineering, Gene products in medicine – Humulin, Erythropoietin, Growth Hormone/Somatostatin, tPA, Interferon. DNA vaccine Biosensors and Biochip.

Module VI. Biotechnology in Industry, Agriculture and Environment

(5 hrs)

Fermentation technology – Stages of fermentation - Fermentation products (antibiotics, alcohol, amino acids, organic acids, vinegar, vitamins, and fuels). Enzyme engineering and applications.

Transgenic plants, Biological nitrogen fixation; Nif genes, Nitrogen fixers – Bio fertilizers (Rhizobium, Azotobacter, Azospirillum, VAM) - Bio pesticides (Bacterial, Fungal, Viral). Terminator gene technology

Module V

Nanobiotechnology

(3 hrs)

Introduction, Nanobiotechnological devices, Types and applications of Nanobiosensors, Drug delivery technologies, personalized nanomedicine.

Intellectual Property Rights, Biosafety and Bioethics

(4 hrs)

Introduction to Intellectual Property Rights, Types of IP: Patents, Trademarks, Copyrights.

Basics of Patents Types of patents; Indian Patent Act 1970; Recent Amendments, Protection of New GMOs. IPs of relevance to Biotechnology and few Case Studies (Rice, Neem, Curcumin).

Introduction to History of GATT, WTO, WIPO and TRIPS.

Biosafety concepts and issues. Biosafety protocol 2000.

Bioethics: Principles of bioethics: autonomy, human rights, beneficence, privacy, justice, equity

- Understand the developmental patterns and influence of genes in the ontogeny of vertebrates and invertebrates.

ZL010203- Genetics and Bioinformatics

The student should:

- Develop in-depth understanding on the principles and mechanisms of inheritance ·
- Study the fine structure and molecular aspects of genetic material ·
- Be provided with an opportunity to learn the importance of inheritance in Man ·
- Be exposed to the emerging field of bioinformatics and equip them to take up bioinformatics studies.
-

ZL010204- Microbiology and Biotechnology

The student should:

- Be provided with an over view of the microbial world, its structure and function ·
- Be familiarized with the applied aspects of microbiology ·
- Have intensive and in-depth learning in the field of biotechnology ·
- Understand the modern biotechnology practices and approaches with an emphasis in technology application, medical, industrial, environmental and agricultural areas ·
- Be familiarized with public policy, biosafety, and intellectual property rights issues related to biotechnology

Semester III

ZL010301- Animal Physiology

The student should:

- Study and compare the functioning of organ systems across the animal world ·
- Be given an over view of the comparative functioning of different systems in animals
- Learn more about human physiology
- Understand regulation of homeostasis in human body
- Have an understanding on the reproductive function of human body

ZL010302- Cell and Molecular Biology

The student should:

- Study the structural and functional details of the basic unit of life at the molecular level ·
- Be motivated to refresh and delve into the basics of cell biology ·

VZ

SEMESTER III

**ZY3CT 13 MICROBIOLOGY AND BIOTECHNOLOGY
72 Hours (30+42) (4hrs/week) Credit- 4**

MICROBIOLOGY 30hrs.

Module I. Introduction to Microbiology 3 hrs.

Methods of Microbiology, Main group of microorganisms, general characters.

Classification, approaches to microbial classification, outline classification, Bergey's manual.

Prerequisite: Discovery of microorganisms. Contributions of Scientists to the field of Microbiology- Anton Von Leewenhoek, Edward Jenner, Lazaro Spallanzani, Louis Pasteur, Joseph Liter, Robert Koch and Alexander Flemming.

Module II. Functional Anatomy of Prokaryotic Cells 3 hrs.

Cell structure, plasma membrane, cytoskeleton, cytoplasm, nucleoid, cytoplasmic inclusions. The prokaryotic cell envelope, peptidoglycan structure, gram positive and negative cell walls. Components outside the cell wall: capsules, slime layers and s- layers, pili and fimbriae, flagella and motility. The endomembrane system, mitochondria and chloroplasts, cell wall and pellicle in protists.

Prerequisite: Morphology, size, shape and cell arrangement.

Module III. Microbial Metabolism 4 hrs.

Energy acquisition by chemotrophs and phototrophs, glycolysis (Embden- Meyerhof pathway). Fermentation, anaerobic oxidations, chemosynthesis. Photosynthesis, carbon assimilation. Regulation of metabolism.

Module IV. Nutrition and Growth 3 hrs.

Common nutrient requirements, nutritional types, growth factors, uptake of nutrients by the cell. Culture media. Reproduction and exponential growth, the growth curve. Physical requirements for bacterial growth and influence of environmental factors on growth.

Module V. Microbial Interactions and Microbial Ecology 4 hrs.

Symbiosis, commensalism. Mutualism between microbes, microbes and plants, microbes and animals. Cooperation, competition, predation, antagonism. Parasitism, plant parasites, animal parasites.

Module VI. Virology 3 hrs.

Properties of viruses, structure and chemical composition, genetic composition eclipse, host interaction and specificity. Classification, RNA virus, DNA virus, plant virus, animal virus, bacteriophage, lysis and lysogeny, Viral replication. Virioids and prions. Nature and significance. Pathogenic virus, oncovirus.

MODULE VII. Applied Microbiology 10 hrs.

Bacteria of air, water and soil. Microbes associated with food production and spoilage, microbiology of milk and dairy products. Epidemiology of human diseases, Mechanism of microbial pathogenicity. Normal microbial population on human body, microbial diseases, Nosocomial infections. Medical mycology. Control of microorganism- physical, chemical and antimicrobial agents. Biological weapons and bioterrorism.

BIOTECHNOLOGY 42 hrs.

Module 1. Introduction to Biotechnology 2 hrs.

Historical aspects, definitions and scope of Biotechnology. Biotechnology in India.

Module II. Tools and Techniques in Recombinant DNA Technology 12 hrs.

Vectors: cloning and expression vectors - Plasmids, Ti and Ri plasmids, cosmids, phasmids, phagemids, bacteriophage, SV40, vectors with combination features; PUC19 and Bluescript vectors, shuttle vectors, viral vectors, BAC and YAC vectors. Restriction enzymes and DNA modifying enzymes. Polymerase chain Reaction- different types and applications. Chromosome walking, chromosome jumping, DNA foot printing. Molecular Markers and Probes-SNP, VNTR, RAPD, RFLP, SSR, STMS, FISH and GISH. DNA sequencing methods- Maxam and Gilberts chemical degradation method, Sanger and Coulson method, Automated DNA sequencers. Site directed mutagenesis, molecular chimeras. Cloning Methodologies - Gene isolation : Shot gun method, Genome libraries, cDNA libraries, Chemical synthesis. Splicing and integration of isolated gene- cohesive end ligation, homopolymer tailing, extending linkers. Methods of rDNA transfer to host cells- CaCl_2 treatment, Virus delivery. Selection and screening of the transformed cells, Blue-white screening, Colony hybridization methods, Reporter genes, Fusion proteins.

Prerequisite: Blotting techniques- Southern, Northern, Western, Dot Blot, DNA finger printing.

Module III. Animal Biotechnology 12 hrs.

Cell and Tissue culture: Basic techniques of mammalian cell culture, disaggregation of tissue and primary culture, maintenance of cell culture and cell separation. Growth media: Physicochemical properties, natural and artificial, Balanced salt solutions, Complete Media, Serum, Serum-Free Media and protein free media and their applications. Biology and characterization of cultured cells, measurement of viability and cytotoxicity. Manipulation of cultured cell and tissues- scaling up of animal cell culture, cell

DEPARTMENT OF ZOOLOGY
TIME TABLE (2019-2020) B. Sc & M.Sc. Even Semester

	I	II	III	IV	V
FIRST DAY	VZ JT IVZ VKV IIIZ AS IIZ JS IB MPJ	VZ AK IVZ AEG IIIZ GKJ IIB MPJ	VZ JS IVZ AS IIIZ(EL) VKV IZ GKJ	VZ(P) AEG IVZ(P) GKJ IIIZ (P) MPJ, AK	VZ(P) AEG IVZ (P) GKJ IIIZ (P) JT, AS
SECOND DAY	VZ AEG IVZ JS IIIZ JT IIZ AS IZ(P) AK, MPJ	VZ GKJ IVZ AK IIIZ VKV	VZ GKJ IVZ AS IIIZ (EL) MPJ IIB JS	VZ (P) AK IVZ (P) VKV IIIZ(P) AEG, AS	VZ (P) AK IVZ (P) VKV IIIZ(P) AEG, GKJ IB MPJ
THIRD DAY	VZ JT IVZ AEG IIIZ AK	VZ VKV IVZ AK IIIZ JS	VZ AS IVZ JS IIIZ(EL) JT IZ VKV	VZ (P) GKJ IVZ(P) AEG IIIZ (EL) MPJ IIB (P) JT, JS	VZ (P) GKJ IVZ(P) AEG IIIZ AK IIB (P) MPJ, JS
FOURTH DAY	VZ AK IVZ GKJ IIIZ AEG IIZ JS	VZ AS IVZ GKJ IIIZ VKV IB(P) MPJ, JT	VZ AEG IVZ VKV IIIZ JS IB(P) MPJ, JT	VZ (P) JS IVZ (P) AK IIIZ (P) AEG, AS	VZ(P) JS IVZ (P) AK IIIZ (P) GKJ, AS IZ (P) VKV, MPJ
FIFTH DAY	VZ VKV IVZ AEG IIIZ AK	VZ JS IVZ JT IIIZ GKJ IIZ(P) AS, VKV	VZ GKJ IVZ AK IIIZ AEG IIZ(P) AS, JT IIB MPJ	VZ (P) VKV IVZ(P) JS IIIZ (P) AK, MPJ	VZ(P) VKV IVZ(P) AS IIIZ(P) JT, MPJ

AK Dr. Ani Kurian - 17 Hrs
 GKJ Dr. Gigi K. Joseph - 16.5 Hrs
 VKV Dr. Vinod K. V - 16 Hrs
 AEG Ms. Ambily Elizebeth George - 16 Hrs
 JS Ms. Jaya S - 16 Hrs
 AS Ms. Ashitha Stanly - 15 Hrs
 MPJ Ms. Merin P. Johny - 14 Hrs
 JT Ms. Jissy Thomas - 12.5 Hrs

(1 theory hour in M.Sc = 1.5 hours for permanent faculty)

IZ - VKV (Class tutor), GKJ, AK, MPJ
 II Z -JS (Class tutor), AS, VKV, JT
 III Z - AK (Class tutor), GKJ, AEG, VKV, AS, JS, MPJ, JT
 IV Z -GKJ(Class tutor), AK, AEG, VKV, AS, JS, JT
 V Z - AEG (Class tutor), AK, GKJ, VKV, JS, AS, JT
 I B -MPJ, JT
 II B - MPJ, JS, JT

DEPARTMENT OF ZOOLOGY
TIME TABLE (2019-2020) B. Sc & M.Sc. Odd Semester

	I	II	III	IV	V
FIRST DAY	VZ AS IVZ AK IIIZ AEG IIZ JS IB MPJ	VZ VKV IVZ JS IIIZ GKJ IIB MPJ	VZ JT IVZ AEG IIIZ(OC) AK IZ GKJ	VZ(P) JT IVZ(P) AK IIIZ (P) GKJ,AEG	VZ(P) JT IVZ (P) AK IIIZ (P) GKJ, AEG
SECOND DAY	VZ MPJ IVZ AEG IIIZ GKJ IIZ AS IZ(P) AK, VKV	VZ GKJ IVZ VKV IIIZ JS	VZ GKJ IVZ AS IIIZ (OC) VKV IIB JS	VZ (P) GKJ IVZ (P) VKV IIIZ(P) JT, AS	VZ (P) AS IVZ (P) AEG IIIZ(P) JS, JT IB MPJ
THIRD DAY	VZ AS IVZ JT IIIZ VKV	VZ VKV IVZ MPJ IIIZ GKJ	VZ AEG IVZ MPJ IIIZ (OC) AS IZ VKV	VZ AEG IVZ(P) AK IIIZ AS IIB (P) MPJ, JS	VZ AEG IVZ(P) GKJ IIIZ AK IIB (P) JT, JS
FOURTH DAY	VZ GKJ IVZ VKV IIIZ JT IIZ AK	VZ JT IVZ GKJ IIIZ AEG IB(P) MPJ, JS	VZ AK IVZ JS IIIZ(OC) VKV IB(P) MPJ, JT	VZ (P) JS IVZ (P) AS IIIZ (P) AK, MPJ	VZ(P) JS IVZ (P) AEG IIIZ (P) VKV, JT IZ (P) MPJ, AK
FIFTH DAY	VZ AS IVZ AEG IIIZ MPJ	VZ VKV IVZ AK IIIZ JS IIZ(P) AS, JT	VZ JS IVZ GKJ IIIZ AK IIZ(P) AS, VKV IIB MPJ	VZ (P) VKV IVZ(P) JT IIIZ (P) AK, JS	VZ(P) AEG IVZ(P) AS IIIZ(P) AK, MPJ

AK Dr. Ani Kurian – 16.5 Hrs
GKJ Dr. Gigi K. Joseph – 15.5 Hrs
VKV Dr. Vinod K. V – 16.5 Hrs
AEG Prof. Ambily Elizabeth George – 16 Hrs
JS Ms. Jaya S– 15.5 Hrs
AS Ms. Ashitha Stanly – 15 Hrs
MPJ Ms. Merin P. J – 15.5 Hrs
JT Ms. Jissy Thomas – 14.5

(1 Hour M. Sc. Theory class = 1.5 Hours for permanent staff)

I Z I Year B.Sc. Zoology AK, VKV, GKJ, MPJ
II Z II Year B.Sc. Zoology AK, AS, JS(MM), AS, JT
III Z III Year B.Sc. Zoology AK, GKJ, VKV, AEG (AP), JS(MM)
IV Z I Year M.Sc. Zoology (II Semester M.Sc. Zoology) AK, JS, AEG, VKV, AS, JT,
MPJ, GKJ
V Z II Year M.Sc. Zoology - ALL
I B I Year B.Sc. Botany MPJ, JS, JT
II B II Year B.Sc. Botany MPJ, JS, JT

F 5087

(Pages : 2)

Reg. No.....

Name.....

6-1-16

M.Sc. DEGREE (C.S.S.) EXAMINATION, JANUARY 2016

Third Semester

Faculty of Science

Branch VIII—Zoology

ZY3CT13—MICROBIOLOGY AND BIOTECHNOLOGY

(2012 Admission onwards)

Time : Three Hours

Maximum Weight : 30

Section I (Short Answer Type Questions)

Answer any ten out of twelve.

Each question carries weight 1.

1. Write down the contributions of Lararo Spallanzani.
2. What are nucleoid ?
3. What is fermentation ?
4. Comment on growth curve.
5. Define Antagonism.
6. Comment on Oncovirus.
7. Mention the scope of biotechnology.
8. Distinguish between BAC and YAC vectors.
9. What is lipofection ?
10. Define biochips.
11. Define bioinsecticides.
12. Give a brief note on : WTO.

(10 × 1 = 10)

Section II (Short Essay Type Questions)

Answer any five out of eight.

Each question carries weight 2.

13. Write down the contributions of Louis Pasteur and Joseph Liter in the field of microbiology.
14. Give a brief note on predation and parasitism.
15. Comment on bacteriophages.

Turn over

16. Discuss about the mechanism of microbial pathogenicity.
17. Highlight the applications of stem cell technology in medicine.
18. Explain briefly about hormones and growth factors.
19. Give a brief account on transgenic plants.
20. Examine critically the biosafety concepts and issues .

(5 × 2 = 10)

Section III (Long Essay Type Questions)

*Answer any two out of three.
Each question carries weight 5.*

21. Describe the microbiology of milk and dairy products.
22. Explain in detail the sewage and solid wastes management.
23. Write an essay on bioethics.

(2 × 5 = 10)

NIRMALA COLLEGE MUVATTUPUZHA

Third Semester (V Z) M. Sc. Zoology Model Examination –October 2019

COURSE: ZY3CT13- MICROBIOLOGY AND BIOTECHNOLOGY

Time: 3hrs

Total Wt. - 30

PART A

(Answer any ten questions out of twelve–1 wt. each)

1. Comment on phagemids and phasmids.
2. Comment on Chromosome walking and jumping.
3. What is blue white screening?
4. What a short note on Noscomial infection.
5. Comment on carbon assimilation in bacteria.
6. What are the physical requirements for bacterial growth?
7. Comment on symbiosis and commensalism in microbes.
8. What is cell line?
9. How to find the viability of cultured cells
10. Comment on Biosensors
11. What is Balanced salt solution
12. Comment on cryogenics

PART B

(Answer any five out of eight 2 wt. each)

13. Give an account on viral replication.
14. Briefly describe RFLP, RAPD, VNTR, SSR.
15. What a short note on Berger's manual.
16. Comment on biological weapons and bioterrorism.
17. Comment on different types of culture media and growth curve of microbes.
18. Describe stem cell culture and its applications
19. Briefly describe cryopreservation
20. Describe different types of PCR and its uses in biotechnology

PART C

(Answer any two out of three –5 wt. each)

21. Write an essay on various DNA sequencing methods.
22. Write an essay on microbiology of milk and dairy products.
23. Elaborate the role of biotechnology in Healthcare.

ASSIGNMENTS - 2019

BIOTECHNOLOGY

TOPIC	DATE OF SUBMISSION	SUBMITTED ON	SIGNATURE
Introduction to intellectual property Rights, Types of IP: Patents, Trademarks, Copyrights.	03-01-2019	03-01-2019	
Basics of Patents. Types of patents; Indian Patent Act 1970; Recent Amendments; Protection of New GMOs. IPs of relevance to Biotechnology and few case studies (Rice, Neem, Curcumin).	"	"	
Introduction to History of GATT, WTO, WIPO and TRIPS	"	"	
Biosafety concepts and issues. Biosafety protocol 2000.	"	"	
Bioethics: Principles of bioethics; autonomy, human rights, beneficence, privacy, justice, equity.	"	"	
PCR. different types and applications, Gene cloning.	"	"	
SV40, vectors with combination features, pUC19 and Bluescript vectors, shuttle vectors, viral vectors, BAC and YAC vectors.	"	"	
Gene therapy: Ex vivo, In situ. Cell and tissue engineering	"	"	

DNA vaccine, Biosensors and Biochip.	03-01-2019	03-01-2019	
Transgenic animals - Production and its applications.	"	"	

BIOINFORMATICS

Primary databases - Nucleotide sequence database: GenBank, EMBL, DDBJ; Protein sequence databases: SWISSPROT, PIR; steps involved in use and interpretation of results.	"	"	
Structure databases: PDB, NDB; Secondary databases: PROSITE, Pfam, CATH; composite databases: OWL; Literature database; PubMed; Database searching. Entrez; Database sequence submission - BankIt.	"	"	
Types of sequence alignment, methods of sequence alignment, scoring schemes, gaps and gap penalties. Phylogenetic trees CLUSTAL W and CLUSTAL ω, PHYLIP	"	"	

M G UNIVERSITY

INTERNAL ASSESSMENT FOR P.G. PROGRAMME-CSS(2018 ADMISSION ONWARDS)

SEMESTER: III Sem-MSc Zool

Centre No : 1

Name of College Nirmala College, Muvattupuzha

Programme : MSc Zoology

Sl. No.	Reg. No.	Name of Candidate	Core Course												Remark
			Title: ZY3CP15		Title: ZY3CP16		Title: ZY3CT11		Title: ZY3CT12		Title: ZY3CT13		Title: ZY3CT14		
			Practical		Practical		Theory		Theory		Theory		Theory		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
1	180011020707	ALEENA SIMON	4.00	A	4.00	A	3.80	A	3.83	A	3.67	A	3.83	A	Acad.
2	180011020708	ALKKA REJIMON	4.00	A	4.00	A	4.00	A	4.00	A	4.00	A	4.00	A	Acad.
3	180011020709	ANN MARIA GEORGE	4.00	A	4.00	A	3.60	A	3.50	A	3.67	A	3.50	A	Acad.
4	180011020710	BISMI SHUKKOOR	4.00	A	4.00	A	3.80	A	3.83	A	3.67	A	3.83	A	Acad.
5	180011020711	DILSHA MURALI	3.92	A	3.92	A	3.80	A	3.67	A	3.50	A	3.67	A	Acad.
6	180011020712	JEBY ELDHO	4.00	A	4.00	A	3.80	A	3.83	A	3.67	A	3.67	A	Acad.
7	180011020713	JESNA SAJI	4.00	A	4.00	A	3.80	A	4.00	A	3.67	A	3.83	A	Acad.
8	180011020714	JOHNCY JOY	4.00	A	4.00	A	3.80	A	3.67	A	3.67	A	3.67	A	Acad.
9	180011020715	KRISHNAPRIYA AK	3.92	A	3.92	A	3.60	A	3.67	A	3.50	A	3.67	A	Acad.
10	180011020716	LEEMA ROSE MATHEW	4.00	A	4.00	A	3.80	A	3.67	A	3.67	A	4.00	A	Acad.
11	180011020717	MAREENA CHACKOCHAN	4.00	A	4.00	A	4.00	A	3.83	A	3.67	A	3.83	A	Acad.
12	180011020718	MERIN FRANCIS	4.00	A	4.00	A	3.80	A	3.67	A	3.67	A	3.50	A	Acad.
13	180011020719	MILAN AUGUSTINE	4.00	A	4.00	A	3.80	A	3.67	A	3.67	A	3.83	A	Acad.

C Certified that 1. The entries are verified with the records and there is no error or omission.

2. These assessments were published and no grievances from the students are pending.

Armbaly Elizabeth George

Name and Signature of the Teacher(s) in Charge



Dr. Anilkumar
Name and Signature of the Head of the Department

(College Seal)

Name and Signature of Principal

Head of the Department

NOMINAL ROLL [2019 - 2020]

SI No.	Roll No	Admn No	Student Name	Second Language	Gender	Religion
Forth Semester-MSc Zoology						
1	5101	Z59686	ANN MARIA GEORGE	NIL	Male	Christian
2	5102	Z59582	JEBY ELDHO	NIL	Male	Christian
3	5103	Z59594	ALEENA SIMON	NIL	Female	Christian
4	5104	Z59551	ALKKA REJIMON	NIL	Female	Christian
5	5105	Z59684	BISMI SHUKKOOR	NIL	Female	Islam
6	5106	Z59589	DILSHA MURALI	NIL	Female	Hindu
7	5107	Z59819	JESNA SAJI	NIL	Female	Christian
8	5108	Z59657	JOHNCY JOY	NIL	Female	Christian
9	5109	Z59813	KRISHNAPRIYA AK	NIL	Female	Hindu
10	5110	Z59679	LEEMA ROSE MATHEW	NIL	Female	Christian
11	5111	Z59713	MAREENA CHACKOCHAN	NIL	Female	Christian
12	5112	Z59678	MERIN FRANCIS	NIL	Female	Christian
13	5113	Z59638	MILAN AUGUSTINE	NIL	Female	Christian

3rd Semester

Cl. No	Name	I st Internal				II Internal				Animal Phy.		Cells Mol. MicroBio.		Immuno.		PRACTICAL I			PRACTICAL II				
		Paper II		Paper III		Paper I		Paper II		Papers I		Paper II		Paper IV		I			II				
		P.I	P.II	P.III	P.IV	P.I	P.II	P.III	P.IV	Assgn	Sem	Assgn	Sem	Assgn	Sem	Test	Lab	Recor	Test	Lab	Recor		
01	Ann Marie George	1.50	3.2	2.6	2.8	1.73	2.8	1.76	1.63	3.7	3.7	3.7	3.6	3.5	3.5	3.6	3.5	3.8	3.7	3.5	3.6	3.8	3.6
		C	B	B	B	C	B	C	C	13.6	13.8	A	A	A	A	A	A	A	A	A	A	A	A
02	Jebby Eldho	3.13	3.8	3.2	3.2	3.23	3.3	2.93	2.87	3.6	3.8	3.8	3.8	3.9	3.9	3.8	3.9	3.9	4	3.7	3.8	4	3.6
		B	A	B	B	B	B	B	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A
03	Aleena Simon	3.33	3.5	2.73	3.53	2.83	2.93	2.9	2.93	3.8	3.8	3.9	3.8	3.8	3.9	3.9	3.9	3.9	4	3.8	3.8	4	3.7
		B	A	B	A	B	B	B	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A
04	Alhka Regimoon	3.53	3.8	3.73	3.53	3.6	3.43	3.5	3.83	3.6	3.9	3.8	3.8	3.9	3.9	3.9	3.9	3.8	4	3.8	3.8	4	3.8
		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
05	Bismita Shukhoo	3.4	3.5	3.27	3.8	2.83	2.5	2.56	2.93	3.7	3.6	3.9	3.7	3.8	3.8	3.6	3.8	3.9	3.6	3.5	3.6	3.7	3.6
		B	A	B	A	B	B	B	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A
06	Dalsha Murali	2.6	3.5	2.8	3.53	2.7	2.43	2.6	2.5	3.7	3.7	3.8	3.8	3.5	3.7	3.6	3.8	3.9	3.6	3.7	3.9	3.7	3.7
		B	A	B	A	B	B	B	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A
07	Jesna Saji	2.86	3.6	2.87	3	3.13	3.23	3.5	3.53	3.6	3.6	3.8	3.7	3.7	3.7	3.5	3.5	3.6	3.9	3.6	3.7	4	3.6
		B	A	B	B	B	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
08	Johnny Joy	3.83	3.2	2.27	3.01	2.73	3.03	2.86	3.37	3.5	3.6	4.0	2.8	3.7	3.7	3.7	3.6	3.7	4	3.7	3.7	4	3.8
		B	B	B	B	B	B	B	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A
09	Krishnapriya A.K	2.86	3.5	2.6	3.53	2.3	2.73	2.96	2.7	3.8	3.6	4.0	3.7	3.5	3.7	3.6	3.7	3.8	3.5	3.6	3.8	3.7	3.7
		B	A	B	A	C	B	B	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A
10	Leena Rose Mathew	2.6	3.2	3.27	3.5	2.26	3.03	3.2	3.53	3.8	3.7	3.9	3.7	3.8	3.8	3.5	3.7	3.6	3.8	3.5	3.6	3.8	3.6
		B	B	B	A	C	B	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
11	Mareena Chackochan	3.8	3.5	3.33	3.73	3.03	3.2	2.86	3.03	3.8	3.8	3.8	3.5	3.5	3.7	3.8	3.8	3.8	4	3.7	3.8	3.8	3.8
		A	A	B	A	B	B	B	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A
12	Meris Francis	2.6	2.5	2.5	2.9	2.46	2.5	2.5	2.4	3.8	3.7	3.8	3.5	3.6	3.7	3.7	3.6	3.8	3.8	3.7	3.8	3.8	3.8
		B	B	B	B	B	B	B	C	A	A	A	A	A	A	A	A	A	A	A	A	A	A
13	Milani Augustine	2.8	3.2	2.7	3.73	2.93	3.03	2.76	3.1	3.8	3.7	3.8	3.7	3.6	3.7	3.8	3.9	3.9	4	3.8	3.9	4	3.9
		B	B	B	A	B	B	B	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A

Assignment

Topic:- CELL CYCLE

Submitted to:
Ambily Elizabeth

By: Abhinand Raj. P

Introduction

Cell division is the process by which a parent cell divides into two or more daughter cells. In unicellular organisms, cell division is the means of reproduction and by this process two or more new individuals arise from the mother cell. In multicellular organism, new individuals develop from a single primordial cell, the zygote. In fact, countless divisions of the zygote produce an organism of astonishing cellular complexity and organization. Cell division does not stop with the formation of the mature organism but continues in certain tissues throughout life. For example, millions of cells, residing within the bone marrow or the lining of the intestinal tract undergo divisions all through the life. This enormous production of cells is needed to replace cells that have aged or died.

THE CELL DIVISION CYCLE

Is considered as the final separation of the already duplicated molecular units.

In a population of dividing cells, whether inside the body or in a culture dish, each cell passes through a series of defined stages, which constitutes the cell cycle. It includes the entire sequence of events happening from the end of one nuclear division to the beginning of the next. Cell cycle comprises essentially of two periods, the 'Interphase' (period of non-apparent division) and the 'period of division'.

Interphase, the period between the cell divisions, is a time when the cell grows and engages in diverse metabolic activities. Whereas the period of division usually lasts only an hour or so in mammalian cells, interphase may extend for days, weeks or longer, depending on the cell type and the conditions. Virtually, cell division is only the final and microscopically visible phase of an underlying change that has occurred at the molecular level. Before the cell divides by mitosis, its main

molecular components have already been duplicated. Accordingly, cell division can be considered as the final separation of the already duplicated molecular units.

Howard & Pelc 1953

Alma Howard and Stephen Pelc published their work on cell proliferation in bean roots. They grew plants with a ^{32}P isotope label and showed that it was incorporated into DNA in the nucleus only during interphase, and that it took 12 hours from the end of division until the beginning of the isotope uptake into new DNA. By analysing heterogeneous populations of moustemetic cells, Howard and Pelc deduced that DNA synthesis takes about six hours, and that cells enter prophase of the next mitosis only eight hours after DNA synthesis is completed.

Howard and Pelc were the first to describe a timeframe to cellular life and they proposed the existence of four periods in the cell cycle: a period of cell division, the pre-S phase (called G₁), the S-phase (a period of DNA synthesis) and period G₂, or the pre-mitotic period. The concept of the cell cycle was born.

G₁ phase: The first phase within interphase, from the end of the previous M phase until the beginning of DNA synthesis (S-phase) is called G₁. (G indicates gap). It is also called the growth phase. During this phase the biosynthetic activities of the cell, which had been considerably slowed down during M phase, resume at a high rate. This phase is marked by synthesis of various enzymes that are required in S phase, mainly those needed for DNA replication. Duration of G₁ is highly variable, even among different cells of the same species. Even though, no DNA

During G_2 period, the cell contains two times ($4n$) the amount of DNA present in the original diploid cell.

Of the various phases of the cell cycle, the G_1 period is the most variable, in most eukaryotic cells it lasts a minimum of three to four hours. Depending on the physiological condition of the cell, it may last days, months or years. The S and G_2 phases, on the contrary are relatively constant.

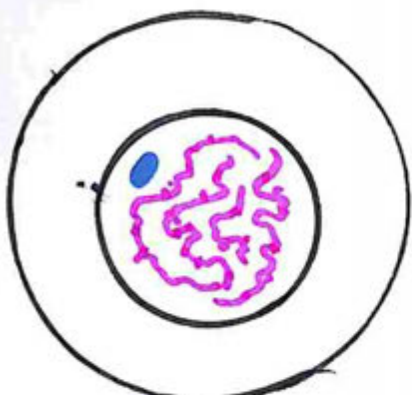
G_0 phase:

Non proliferative cells in multicellular eukaryotes generally enter quiescent state called G_0 from G_1 and may remain quiescent for long periods of time; possibly indefinitely (as is often the case for neurons). This is very common for cells that are fully differentiated.

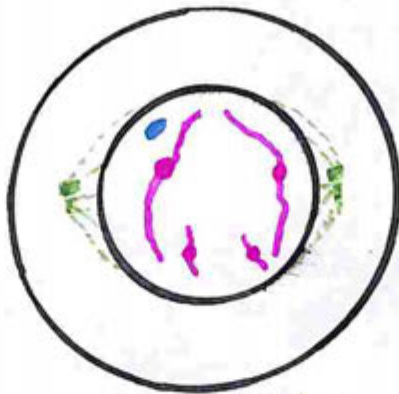
M phase:

This is the divisional phase. It is characterised by separation of the sister chromatids of each chromosome and their migration to opposite poles, followed by cytokinesis or cytoplasmic cleavage. M phase is generally much shorter than interphase, lasting perhaps only one to two hours. During cell division, the nucleus undergoes a series of complex changes, in which the nuclear envelope and the nucleolus disappear and the chromatin fibres become condensed into thread like bodies called chromosomes. In fact, chromosomes are always present in the nucleus. But during interphase, they are not generally visible because they are in dispersed and loosely distributed state within the nuclear sphere.

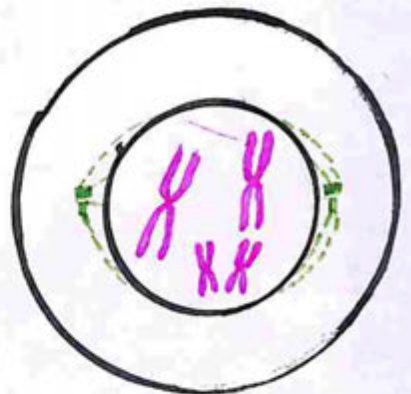
The length of the cell cycle varies considerably in different types of cells. Some cells have a short life cycle and cell division takes place



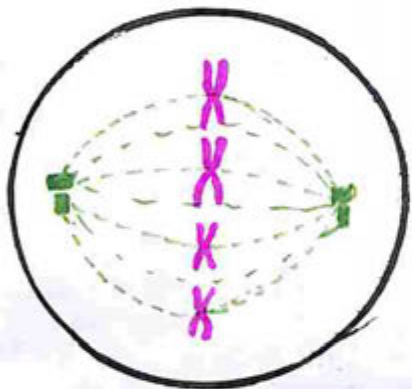
Interphase



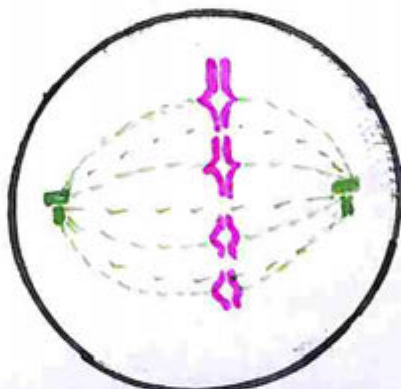
Early Prophase



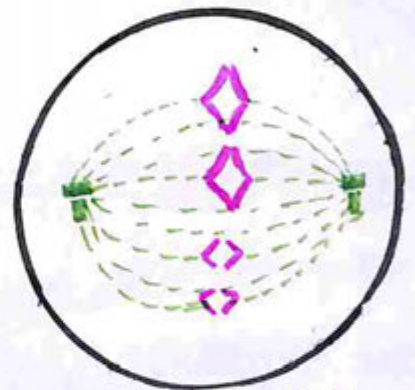
Late Prophase



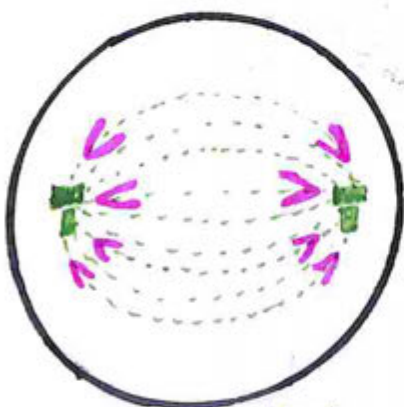
Early metaphase



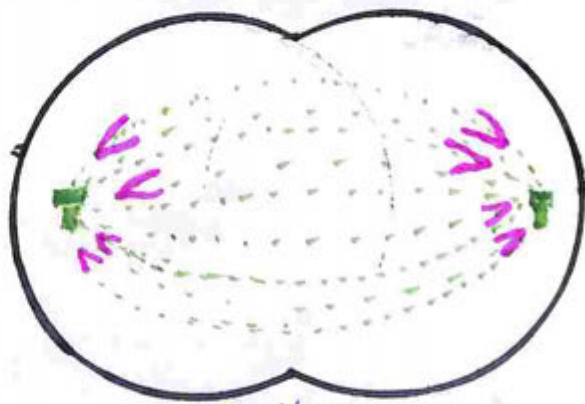
Late Metaphase



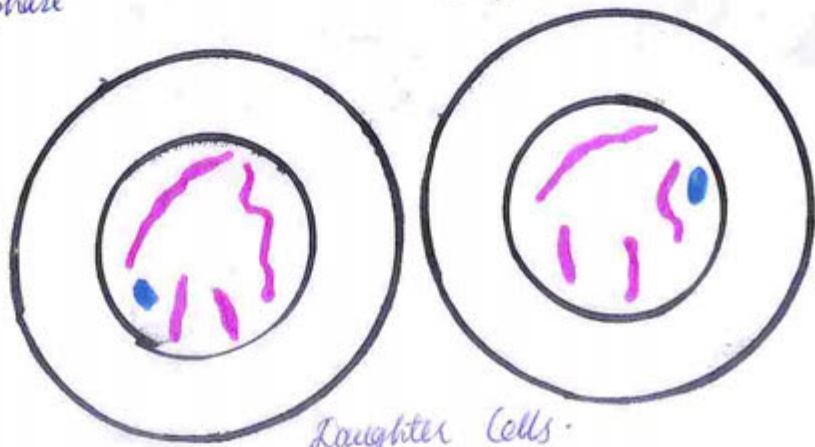
Early Anaphase



Late Anaphase



Telophase



Daughter Cells

TOPICS BEYOND SYLLABUS WITH REFERENCES

1. Mapping gene function in the embryo

Davidson Duncan and Richard Baldrk-Nature Review and Genetics 2

2. Applications of bio-informatics: www.biotechnologyforums.com

3. Advances in water treatment by absorption technology-

Ali, I, Gupta V, Advances in water treatment by absorption technology

4. Regulatory sequences finding and analysis

Benos P.V, Lapedes, A.S and Stromo

5. Predicting functional structures

Langaver

6. D.N.A Sequence Analysis- Benos P.V, Buly K, M.L and Stromo, GD

