Pazhassiraja College,Pulpally,Wayanad
NAAC re-accredited by A+ grade.
Department of B.VOC. Agriculture
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IQAC

BRIDGE COURSE

Objectives:

Give students the confidence and skills for the successful transition from schools to college and new curriculum

Report

A Bridge Course for newly admitted students of Vocational Studies (2023-24 Batch) wasconducted before the commencement of the first semester classes. The main aim of the course was to act as a buffer for the new entrants with an objective to provide adequate time for the transition to hardcore of degree courses.This gives them a breather, to prepare themselves before the onset of courses for first year degree programme.

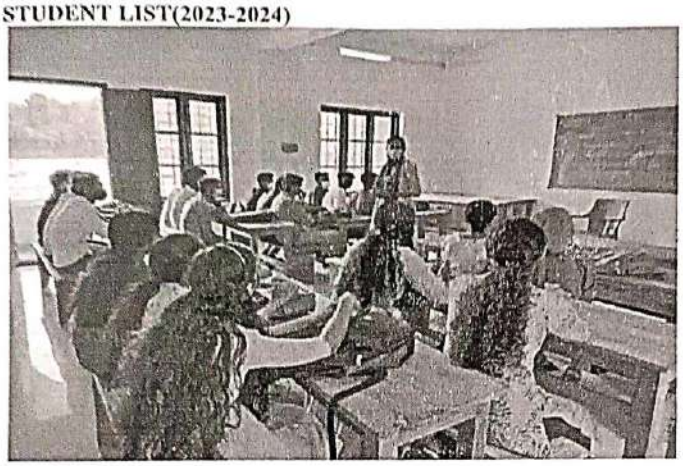
During this interaction with the faculty and their classmates the students will be equipped with the knowledge and the confidence needed to take on bigger challenges in future. The syllabus for the course is framed, in such a way that they get basic knowledge on the subjects which they would be learning through graduation.

Assistant Professor & Head
Department of Vocational Studies(Agriculture)
Pazhassiraja College - Pulpally
Wayanad 673579

PRINCIPAL IN CHARGE
PAZHASSIRAJA COLLEGE
PULPALLY - 673579

A curriculum was framed separately for each of the subjects for Bridge Courses. The students were familiarised with different subjects and various scientific terms of agriculture during this course. A test was conducted after the completion of the bridgecourses to assess the ability of students and suggestions were given to students for improvisation.

STUDENT LIST(2023-2024)



SI.NO	NAME OF THE STUDENT	SIGNATURE
1	HRIDHANYA M	
2	SABARI S	
3	SONARA K	
4	SWATHI E	
5	MARIYA AKASH A	
6	BHAGYA P	
7	FATHIMA RAHMAN	
8	POOJABHAI N P	
9	PRANATHA M	
10	SUKANYA C K	
11	AKARSH PP	
12	INDRAJ C V	

13	MUHAMMED ASHIQ V K	
14	SACHIN RAJ	
15	VISHNU P K	
16	ASHWIN SANTO	
17	ABHINANDHA SANTHOSH	
18	FATHIMA HIBA C	
19	FATHIMA SHAMNA T	
20	FARSEEN K	

UNIVERSITY OF CALICUT

B.Voc DEGREE PROGRAMME
IN
AGRICULTURE
(LRP Pattern)

CHOICE BASED CREDIT AND SEMESTER SYSTEM VOCATIONAL UG (CBCSS VUG – 2021)

UNDER THE

FACULTY OF SCIENCE

PROGRAMME CURRICULUM

(FOR THE STUDENTS ADMITTED FROM THE ACADEMIC YEAR 2021 ONWARDS

BOARD OF STUDIES IN B.VOC AGRICULTURE (SINGLE BOARD)

CONTENTS

REGULATIONS FOR THE DEGREE OF B.Voc AGRICULTURE

1. TITLE OF THE PROGRAMME:

This programme shall be called Bachelor of Vocational studies in Agriculture under Choice Based Credit and Semester System for Vocational Under Graduate Curriculam 2021(CBCSSVUG2021)

2. PROGRAMME – AN OVERVIEW

The University Grants Commission (UGC) had launched a scheme for skills development based higher education as part of college/university education, leading to Bachelor of Vocation (B.Voc.) degree with multiple entry and exit points. The B.Voc. programme is focused on universities and colleges providing undergraduate studies which would also incorporate specific job roles along with general education. This would enable the graduates completing B.Voc to make a meaningful participation in accelerating India's economy by gaining appropriate employment, becoming entrepreneurs and creating appropriate knowledge.

B. Voc is a three year undergraduate degree programme in agriculture. The above mentioned course deals with agriculture science. Agriculture science deals with applying scientific knowledge, technology and principles to boost agricultural productivity. It has a multidisciplinary scope. This course consists of elements such as chemistry, biology, animal husbandry, technology, management, and marketing. Agriculture is a broader concept within itself. It consists of many sub-disciplines and sub-branches such as, floriculture, horticulture, poultry farming, organic farming and many more.

The programme will make the student an agriculture professional who can deal with the various aspects of agriculture and farming.

Broad Objectives

Upon successful completion of the programme, students will:

- To provide judicious mix of skills relating to a profession and appropriate content of General Education.
- To ensure that the students have adequate knowledge and skills, so that they are work ready at each exit point of the programme.
- To provide flexibility to the students by means of pre-defined entry and multiple exit points.
- To integrate NSQF within the undergraduate level of higher

education in order to enhance employability of the graduates and meet industry requirements. Such graduates apart from meeting the needs of local and national industry are also expected to be equipped to
become part of the global workforce.

- To provide vertical mobility to students coming out of 10+2 with vocational subjects
- accommodate insightful information of Agriculture principles necessary for the applications of Agriculture.
- Graduates of the program will acquire knowledge of recent trends in technology and solve problem in industry and farmers

Programme Outcome (PO)

- PO-1 To impart first hand knowledge on agriculture and allied sciences
- PO-2 Understand the impact of the professional agricultural solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
- PO-3 To demonstrate research based knowledge of the legal and ethical environment impacting agriculture organizations and exhibit an understanding and appreciation of the ethical implications of decisions
- PO-4 To demonstrate an understanding of and appreciation for the importance of the impact of globalization and diversity in modern agriculture organizations. Understanding of globalization, and NGO working
- PO-5 To understand and analyze the current events and issues that are occurring in agriculture and how they affect futuristic agriculture
- PO-6 To understand and analyze the current events and issues that are occurring in agriculture and how they affect futuristic agriculture
- PO-7 Able to recognize and examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions. To understand mechanics of a agripreneurship

Programme Specific Outcome (PSO)

- PSO-1 To acquire knowledge on the importance of agriculture and various types of farming.
- PSO-2 To acquaint yourself with importance, division and classification of horticultural crops and to understand the basic principles and types of plant propagation.
- PSO-3 To familiarize with fundamentals of water management and to acquaint yourself with various soil conservation methods.
- PSO-4 To understand the fundamentals of Plant breeding, Basics of Seed technology and cultivation aspects of Plantation crops, spices and fruit crops.

- PSO-5 To build theoretical foundations in plant tissue culture and biotechnology and to develop knowledge on the theoretical basis of integrated pest management and also to familiarize with protected cultivation structures and cultivation practices.
- PSO-6 To understand the general characters of weeds and their management and to acquaint with cultivation of rice, fibre crops, fodder crops, etc
- PSO -7 To develop practical skill in propagation and cultivation aspects of horticultural crops, Plantation crops, spices and fruit crops
- PSO-8 To develop skill in various aspects of seed production and to do the micropropagation of plants.

3. ELIGIBILITY CRITERIA FOR ADMISSION

- The admission to this programme will be as per the rules and regulations of the University for UG admissions.
- Basic eligibility for B. Voc is 10+2 and above in any stream (No age limit).
- A weightage of 25 marks will be given to VHSE students from the concerned area of specialization
- The eligibility criteria for admission shall be as announced by the University from time to time.
- Separate rank lists shall be drawn up for reserved seats as per the existing rules.
- The candidates admitted for B.Voc. Degree (without multiple exit) shall subsequently undergo the prescribed courses of study in a college affiliated to the University for six semesters within a period of not less than three years; clear all the examinations prescribed and fulfil all such conditions as prescribed by the University from time to time.
- The college shall make available to all students admitted a prospectus listing all the courses offered in various departments during a particular semester. The information so provided shall contain the title of the courses, the semester in which it is offered and credits for the courses. Detailed syllabi shall be made available in the University/college websites.
- There shall be a uniform calendar prepared by the University for the registration, conduct/schedule of the courses, examinations and publication of results. The University shall ensure that the calendar is strictly followed.
- Grace Marks may be awarded to a student for meritorious achievements in co-curricular activities such as Sports/Arts/ NSS/NCC/ Student Entrepreneurship.
- Preferred subjects & index mark calculations will be decided by the respective Board of Studies

4. DURATION OF THE PROGRAMME

- Duration of an undergraduate programme is six semesters distributed over a period of 3 academic years.
- An academic week is a unit of five working days in which distribution of work is organized from Monday to Friday with six contact periods of one hour duration on each day.
- A sequence of 18 such weeks (16 instructional weeks and 2 weeks for examination) constitutes a semester.

5. COURSE STRUCTURE

- **Programme** means the entire course of study and examinations for the award of a degree.

- **Courses:** Course means a segment of subject matter to be covered in a semester. This undergraduate programme includes 3 types of courses, *viz.*,

i. **General Education Components (GEC):** Common course means a course that comes under the category of courses, including compulsory English and additional language courses and a set of General courses applicable for Language Reduced Pattern (LRP) programmes, the selection of which is compulsory for all students undergoing UG programmes.

ii. **Skill Development Components (SDC):**

a) This component should match the skill gap identified.

b) At least 50% of Skill Development Component should be allotted to practical and can grow

up to 60% based on the nature of the course. The practical component can be carried out in the college and/or the industry partner premises

iii. **Audit courses** are courses which are mandatory for a programme but not conducted for the calculation of SGPA or CGPA. There shall be one audit course each in the first 4 semesters. Audit courses are not meant for class room study. The students can attain only pass (Grade

P) for these courses. At the end of each semester there shall be an examination conducted by the college from a pool of questions (Question Bank).

iv. Electives: Students are permitted to take elective subjects provided along with the syllabus of the programme.

6. CREDIT

- Each course shall have certain credits. **Credit** is a unit of academic input measured in terms of weekly contact hours/course contents assigned to a course.
- A student is required to acquire a minimum of 180 credits for the completion of the UG programme which shall only be counted for SGPA and CGPA.
- The maximum credit for a course shall not exceed 5 and the minimum credit for a course is 2.
- Each subject shall have a certain number of credits assigned to it depending upon the academic load and the nature and importance of the subject.

- Audit course shall have 4 credits as per course and a total of 16 credits in the entire programme. The credit of the audit course or extra credits are not counted for SGPA or CGPA.
- **Extra credits** are mandatory for the programme. Extra credits will be awarded to students who participate in activities like NCC, NSS and Swatch Bharath. Those students who could not join in any of the above activities have to undergo Calicut University Social Service Programme (CUSSP). Extra credits are not counted for SGPA or CGPA. The maximum credits acquired under extra credits shall be 4. If more Extra credit activities are done by a student that may be mentioned in the Grade card.

7. SCHEME OF EVALUATION

The evaluation scheme for each course shall contain two parts 1) internal evaluation 2) external evaluation. 20% weight shall be given to the internal evaluation. The remaining 80% weight shall be for the external evaluation. The marks secured for internal evaluation only need to be sent to University by the colleges concerned. The internal evaluation shall be based on a predetermined transparent system involving written tests, classroom participation based on attendance in respect of theory courses and lab involvement/records attendance in respect of practical courses. Internal evaluation of the project will be based on its content, method of presentation, final conclusion and orientation to research aptitude. Components with percentage of marks of internal evaluation of theory Courses are- Test paper 40%, Assignment 20%, Seminar 20% and Classroom participation based on attendance 20%.

For practical courses - Record 60% and lab involvement 40% as far as internal is concerned. (If a fraction appears in internal marks, the nearest whole number is to be taken) For the test paper marks, at least one test paper should be conducted. If more test papers are conducted, the mark of the best one should be taken. To ensure transparency of the evaluation process, the internal assessment marks awarded to the students in each course in a semester shall be notified on the notice board at least one week before the commencement of external examination. There shall not be any chance for improvement for internal marks.

The course teacher(s) shall maintain the academic record of each student registered for the course, which shall be forwarded to the University by the college Principal after obtaining the signature of both course teacher and Head of the Department. The split up of marks for Test paper and Classroom Participation (CRP) for internal evaluation are as follows.

Split Up of Marks for Test paper

f Marks in Test paper	Out of 8 (Maximum marks is 20)	Out of 6 (Maximum marks is 15)

Less than 35%	1	1
35%- 45%	2	2
45% - 55%	3	3
55% - 65%	4	4
65% -85%	6	5
85% -100%	8	6

Split Up of Marks for Classroom Participation

Range of CRP	Out of 4 (Maximum marks is 20)	Out of 3 (Maximum marks is 15)
50% ≤CRP <75%	1	1
75% ≤CRP <85%	2	2
85 % and above	4	3

External Evaluation

External evaluation carries 80% of marks. All question papers shall be set by the University. The external question papers may be of uniform pattern with 80/60 marks. The courses with 2/3 credits will have an external examination of 2 hours duration with 60 marks and courses with 4/5 credits will have an external examination of 2.5 hours duration with 80 marks. The external examination in theory courses is to be conducted by the University with question papers set by external experts. The evaluation of the answer scripts shall be done by examiners based on a well-defined scheme of valuation and answer keys shall be provided by the University. The external examination in practical courses shall be conducted by two examiners
– one internal and an external, the latter appointed by the University. The project evaluation with viva also shall be conducted by two examiners – one internal and an external, the latter appointed by the University.

The model of question papers may be prepared by the concerned Board of Studies. Each question should aim at – (1) assessment of the knowledge acquired (2) standard application of knowledge (3) application of knowledge in new situations. Different types of questionsshall possess different marks to quantify their range. A general scheme for the question paper is given below.

Question paper type 1

Scheme of Examinations:

The external QP with 80 marks and Internal examination is of 20 marks. Duration of each external examination is 2.5 Hrs. The pattern of External Examination is as given below. The students can answer all the questions in Sections A&B. But there shall be Ceiling in

each section.

Section A

One word answer type carries 1 marks each - 10 questions	10

Section B

Short answer type carries 2 marks each - 8 questions	16

Section C

Short Essay type carries 4 marks each- 6 questions	24

Section D

Essay type carries 15 marks each- 2 questions	15
Total	80

Question paper type

Scheme of Examinations:

The external QP with 60 marks and Internal examination is of 15 marks. Duration of each external examination is 2 Hrs. The pattern of External Examination is as given below. The students can answer all the questions in Sections A & B. But there shall be Ceiling in each section.

Section A

Short answer type carries 2 marks each - 12 questions	Ceiling - 20

Section B

Paragraph/ Problem type carries 5 marks each - 7 questions	Ceiling - 30

Section C

Essay type carries 10 marks (1 out of 2)	1X10= 10
Total	60

B. Voc PROGRAMME

SEMESTER I									
C. No	**Course Code**	**Course Name**	**Credit**	**Marks**			**Hrs/wk**		
				Int	**Ext**	**Tot**	**T**	**P**	**Tot**
1.1	A01	English	3	15	60	75	3		3
1.2	A02	English	3	15	60	75	3		3
1.3	A07(3)	Mal/Hindi/Arabic	4	20	80	100	4		4
1.4	SDC1AG01	Fundamentals of Agronomy	4	20	80	100	4		4
1.5	SDC1AG02	Fundamentals of Horticulture	4	20	80	100	4		4
1.6	SDC1AG03	Fundamentals of Soil Science	4	20	80	100		4	4
1.7	SDC1AG04(P)	Fundamentals of Agronomy and Horticulture – Practicals	4	20	80	100	1	3	4
1.8	SDC1AG05(P)	Fundamentals of Soil Science – Practicals	4	20	80	100	1	3	4
1.9	Audit Course 1	Environmental Studies	4						
Semester Total			**30**			**750**	**20**	**10**	**30**
SEMESTER II									
C.				**Marks**			**Hrs/wk**		

No	Course Code	Course Name	Credit	Int	Ext	Tot	T	P	Tot
2.1	A03	English	4	20	80	100	4		4
2.2	A04	English	4	20	80	100	4		4
2.3	A08(3)	Mal/Hindi/Arabic	4	20	80	100	4		4
2.4	SDC2AG06	Plantation Crops, Spices and Fruits	4	20	80	100	4		4
2.5	SDC2AG07	Fundamentals of Seed technology	4	20	80	100	4		4
2.6	SDC2AG08(P)	Plantation Crops, Spices and Fruits -Practicals	3	15	60	75		3	3
2.7	SDC2AG09(P)	Seed technology-Practicals	3	15	60	75		3	3
2.8	SDC2AG10(Pr)	Internship/Project (Cultivation of Crops)	4	20	80	100		4	4
2.9	Audit Course II	Disaster management	4						
Semester I I Total			**30**			**750**	**20**	**10**	**30**

SEMESTER III

C. No	Course Code	Course Name	Credit	Marks			Hrs/wk		
				Int	Ext	Tot	T	P	Tot

3.1	A11	Biodiversity- scope and relevance	4	20	80	100	4		4
3.2	A12	Research Methodology	4	20	80	100	4		4
3.3	SDC3AG11	Plant Tissue Culture & Biotechnology	4	20	80	100	4		4
3.4	SDC3AG12	Integrated Pest Management in Crops	4	20	80	100	4		4
3.5	SDC3AG13	Fundamentals of Agricultural Engineering	4	20	80	100	4		4
3.6	SDC3AG14(P)	Agricultural Engineering – Practicals	4	20	80	100	4/	4	4
3.7	SDC3AG15(P)	Micropropagation of Plants-Practicals	3	15	60	75		3	3
3.8	SDC3AG16(P)	Integrated Pest Management-Practicals	3	15	60	75		3	3
	Audit course **AUD3E03**	Human Rights	4						
Semester III Total			**30**			**750**	**20**	**10**	**30**

SEMESTER IV

C. No	**Course Code**	**Course Name**	**Credit**	**Marks**			**Hrs/wk**		
				Int	**Ext**	**Tot**	**T**	**P**	**Tot**
4.1	A13	Natural Resource Management	4	20	80	100	4		4
4.2	A14	Intellectual Property Rights	4	20	80	100	4		4

4.3	SDC4AG17	Protected Cultivation of Horticultural Crops	3	15	60	75	3		3
4.4	SDC4AG18	Weed Management and Fodder Crop Production	4	20	80	100	4		4
4.5	SDC4AG19	Livestock Farming	4	20	80	100	4		4
4.6	SDC4AG20(P)	Protected Cultivation of Horticultural Crops- Practicals	4	20	80	100		4	4
4.7	SDC4AG21(P)	Weed Management and Fodder Crop Production and Livestock Farming- Practicals	3	15	60	75		3	3
4.8	SDC4AG22(P)	Internship/Project (Cultivation of Rice)	4	20	80	100		4	4
	Audit Course IV **(AUD4E04)**	GENDER STUDIES	4						
Semester IV Total			**30**			**750**	**19**	**11**	**30**

SEMESTER V

C. No	**Course Code**	**Course Name**	**Credit**	**Marks**			**Hrs/wk**		
				Int	**Ext**	**Tot**	**T**	**P**	**Tot**

5.1	SDC5AG23 E1/E2	E1-Environmental Microbiology and Biotechnology/ E2-Government Policies and Programmes Related to Agriculture	4	20	80	100	4		4
5.2	SDC5AG24 E3/E4	E3-Food and Dairy Microbiology/ E4-Landscaping and Gardening	4	20	80	100	4		4
5.3	SDC5AG25	Commercial Vegetable Production	4	20	80	100	4		4
5.4	SDC5AG26	Agricultural Enterprises	3	15	60	75	3		3
5.5	SDC5AG27	Fundamentals of organic Farming	4	20	80	100	4		4
5.6	SDC5AG28 (P)	Agricultural Enterprises and fundamentals of organic Farming- Practicals	3	15	60	75		3	3
5.7	SDC5AG29(P)	Commercial Vegetable Production- Practicals	4	20	80	100	1	3	4
5.8	SDC5AG30(P)	Landscaping and Gardening – Practicals	4	20	80	100		4	4
Semester V Total			**30**			**750**	**20**	**10**	**30**

SEMESTER VI

C. No	**Course Code**	**Course Name**	**Credit**	**Marks**			**Hrs**		
				Int	**Ext**	**Tot**	**T**	**P**	**Tot**

6.1 6.2	SDC5AG31(Pr) SDC5AG32(P)	Term paper Internship & Project (900hrs.) Internship Project	30	50 400 400	-- 1600 1600	50 200 200		900	900
Semester VI Total			**30**	1300	3200	**4500**			**900**
Grand Total			**1800**			**4200**			

B. Voc Programme in Agriculture Detailed Syllabus

SEMESTER I

Course No: 1**.4** Course Code: SDC1AG01 Course Name**:** Fundamentals of Agronomy	Credits:4 Hours per week:4 Total hours: 60
Course Objectives	
To enable the students to acquire knowledge on importance of agriculture and various types of farming. To study the fundamentals of agronomy and classification of field crops	
Course Outcomes	
CO1: Describe the importance of agriculture in India and Kerala **CO2**: To understand the agricultural classification of crops **CO3**: Explain the Soil productivity and fertility **CO4**: Describe the crop nutrition and nutrient cycling through manures and fertilizers. **CO5**: Explain the Integrated Nutrient Management. **CO6**: Explain the irrigation and irrigation methods.	

MODULE 1 **12 Hrs**

Importance of agriculture in India and Kerala, Hunger and food security, Agronomy, Sustainable agriculture, Subsistence agriculture, commercial agriculture, Extensive and intensive agriculture,

Peasant farming, Urban agriculture, Agribusiness, Agricultural seasons in India and Kerala, Rainfed and irrigated agriculture.

MODULE 2 **12Hrs**

Agricultural classification of crops, Agronomic classification of crops, Botanical classification of crops, Major farming systems in Kerala and Cropping Intensity, Methods of sowing/planting - planting geometry and its effect on growth and yield.

MODULE 3 **12Hrs**

Soil and climatic requirements, varieties, cultural practices, special systems of cultivation, harvesting and processing of major cereals and millets, pulses, tubercrops, rice, maize,

fingermillet, cowpea, tapioca, sweetpotato, amorphophallus, yams, coleus, arrowroot etc

MODULE 4 **12Hrs**

Soil productivity and fertility. - Crop nutrition - nutrients -classification - Nutrient sources- organic manures -fertilizers - biofertilizers .Nutrient recycling through manures and fertilizers - organic manures. Fertilizers and fertilizer use- management of fertilizers. Biological nitrogen fixation, Green manure crops and cover crops. Integrated Nutrient Management.

MODULE 5 **12Hrs**

Irrigation: definition and objectives. Role of water in soil and plants- Irrigated agriculture vs. Rainfed agriculture, dry farming and dryland farming-defenition.Water resources and in India and Kerala. Irrigation methods - drip and sprinkle irrigation systems. Water management of different crops like rice, banana, coconut, cowpea, and vegetables.

Text Books:

1. Balasubramaniyan, P and Palaniappan, S.P. 2001. Principles and Practices of Agronomy
   AgroBios(India)Ltd., Jodhpur.
2. Cox, G.W and Atkins, M.D. 1979. Agricultural Ecology : An Analysis of World Food Production Systems. W.H. Freeman and Company, San Francisco
3. De, G.C.1989.Fundamentals of Agronomy. Oxford & IBH Publishing Co., New Delhi.
4. Grigg, D.B. 1974. The Agricultural Systems of the World: An Evolutionary Approach. Cambridge University Press, Cambridge.
5. Harlan, J.R. 1992. Crops and Man. American Society of Agronomy& Crop Science Society of America, Madison, WI.
6. Havlin, J. L., Beaton, J. D., Tisdale, S.L., and Nelsothn, W.L. 2006. Soil Fertility and Fertilizers: An Introduction to Nutrient Management (7 ed.). Pearson Education, Delhi.
7. ICAR.2006. Hand book of Agriculture, ICAR, New Delhi.
8. Janick, J., Schery, R.W., Woods, F.W., and Ruttan, V.W. 1974. Plant Science: An Introduction to World Crops. W.H. Freeman and Company, San Francisco.
9. Noor Mohammed.1992. Origin, diffusion and development of agriculture. In: Noor Mohammed (ed.), New Dimensions in agricultural geography: Vol.1.Historical Dimensions of agriculture. Concept publishing Co., New Delhi.pp29-75.
10. Reddy.T.Y and Reddy, G.H.S.1995.Principles of Agronomy, Kalyani Publishers, Ludhiana.
11. Chatterjee, B.N. and Maiti, S.1985.Principles and Practices of Rice Growing. Oxford & IBH Publishing Co., New Delhi.

Course No: 1**.5** Course Code: SDC1AG02 Course Name**:** Fundamentals of Horticulture	Credits:4 Hours per week:4 Total hours: 60
Course Objectives	
To acquaint with importance, division and classification of horticultural crops. To understand the basic principles and types of plant propagation.	
Course Outcomes	
CO1: Describe the definition, importance, division and classification of horticultural crops. **CO2**: Explain the layout, planting systems and management practices in an orchard. **CO3**: Describe the training and pruning in horticultural crops **CO4**: Describe the fruit drop and seedlessness in horticultural crops.. **CO5**: Describe the different types of plant propagation methods **CO6**: Describe the components of the nursery and its various aspects.	

MODULE 1 **12 Hrs**

Horticulture - definition, importance, division and classification of horticultural crops. Importance of horticulture in India and Kerala. Orchard planning, layout, planting systems - management practices.Tree forms and functions - Training and pruning in horticultural crops - principles and methods, techniques of training and pruning, fruit thinning.

MODULE 2 **12Hrs**

Phases of growth and development - vegetative/ reproductive balance; Flowering in plants - bearing habit and its classification- factors associated with flowering and fruit set. Fruit set and development - structure and process concerned with setting. Fruit drop - factors affecting and control measures - unfruitfulness - internal and external factors. Seedlessness in horticultural crops; significance and induction.

MODULE 3 **12 Hrs**

Plant propagation - definition and basic concepts, sexual and asexual types - advantages and disadvantages. Media, containers, potting, repotting and pre planting treatments. Asexual propagation -propagation by cuttings, types of cuttings, factors affecting rooting of cuttings. Propagation by layering - types of layering.

MODULE 4 **12 Hrs**

Propagation by grafting - methods of grafting - development of graft unions, separation and after care. Stock-scion relationship - Graft incompatibility - factors affecting incompatibility. Propagation by budding, methods of budding - A comparative study between grafting and budding.

MODULE 5 **12 Hrs**

Nursery - site selection, layout - components of a nursery - production unit, sales unit,

display area, management and maintenance, propagation unit - close planted progeny orchards. Plant propagating structures-.greenhouse, glasshouse, hot bed, cold frame, lath house, net house, mist chamber.

Text books:

1. Bose, TK., Mitra, SK. and Sadhu, K. 1986.*Propagation of tropical and subtropical horticultural crops*. Naya Prokash, Calcutta.
2. Denixon, RI. 1979. *Principles of Horticulture*. Mac Millan, New York.
3. Edmond, JB., Sen, TD, Andrews, TS and Halfacre, RG. 1977. *Fundamentals of Horticulture.* Tata McGraw Hill, New Delhi.
4. Hartmann, HT. and Kester, DE.1986.*Plant propagation - Principles and practices*.Prentice-Hall, New Delhi.
5. Leopold, A.C. and Kriedeman, P.E. 1975.*Plant Growth and Development.* Tata McGrawHill Publishing Co. Ltd., New Delhi.
6. Chadha, K. L. 2003. Handbook of Horticulture, ICAR, New Delhi.Choudhury, B.1983. Vegetables. National Book Trust, New Delhi.
7. Das, P. C.1993. Vegetable crops in India.Kalyani Publishers
8. Gopalakrishnan, T. R. 2007. Vegetable Crops.New India Publishing Agency, NewDelhi.
9. Hazra, P. and Som, M. G. 1999. Technology for vegetable Production and Improvement.Naya Prokash, Calcutta

Course No: 1**.6** Course Code: SDC1AG03 Course Name**:** Fundamentals of Soil Science	Credits:4 Hours per week:4 Total hours: 60
Course Objectives	
To provide the student with a formalized way to build their fundamental knowledge and skills within the different areas of soil science to enhance their professional skills To provide a better appreciation of the distribution and variability of soils and their properties across the landscape. To impart knowledge to the students on the Fundamentals of Soil Science and impart skills in collecting and analyzing soils for basic physical, physico-chemical and chemical properties for using it as a medium for plant growth.	
Course Outcomes	
CO1:Understand the fundamentals and principles of Soil Science **CO2**:Explain how different soils are formed and how does soils act as a medium for plant growth. **CO3**:Explain soils of India and Land use capability, soil pollution and its effect on crop and mitigation of soil pollution **CO4**: Analyze the soils for basic physical, physico-chemical & chemical properties.	

Module 1 **12 Hrs**

Soil – Rocks – different kinds of rocks, formation and classification. Soil forming minerals – primary, secondary, accessory minerals – classification. Weathering of rocks and minerals types of weathering, factors affecting weathering. Soil formation – factors and processes of soil formation, soil development.

Module 2 **12 Hrs**

Soil physical properties – soil texture, importance of soil texture, textural classification of Soils. Soil structure – definition, classification. Aggregation of soil particles – factors controlling them. Soil consistency - Soil crusting. Soil compaction -Soil air – importance – composition – comparison with atmospheric air, factors affecting the composition of soil air – dynamics – importance

Module 3 **12 Hrs**

Soil classification, need for classification, comparison of different systems of classification. Soil taxonomy and its characteristics. Soil survey-importance, objectives-different types -Land capability classification. Soils of India – Geological formation and soils of Kerala – characterization.

Module 4 **12 Hrs**

Soil organic matter – composition - properties - decomposability, influence on soil properties. Humus fractions of soil Organic matter – carbon cycle - Transformation of organic matter – C:N ratio. Soil biology - soil organisms- their beneficial and harmful roles. Role of organic matter in maintaining the physical and chemical properties of soils-importance in plant nutrition.

Suggested Readings

1. Biswas, T.D. and Mukherjee, S.K. 1987. TextBook of Soil Science. Tata McGraw Hill Publishing Co., New Delhi
2. Black, C.A. 1982. Methods of Soil Analysis, Part I ASA, Madison, USA.
3. Brady, N.C. 1990 Nature and Properties of Soils. 10th Edn, Macmillan Publishing Co. Inc., New York
4. Das, D.K. 1997. Introductory Soil Science. Kalyani Publishers New Delhi
5. Fundamentals of Soil Science. Published by Indian Society of Soil Science, IARI New Delhi, 2002
6. Gupta, P.K. 2007. Soil, Plant, Water and Fertilizer Analysis. Published by AGROBIOS (India), Jodpur
7. Jackson, M.L. 1973 Soil Chemical Analysis. Prentice hall of India, New Delhi
8. Jaiswal, P.C. 2006. Soil, Plant and Water Analysis. 2nd Edn. Kalyani Publishers,

Ludhiyana
9. Page, A.L. 1982. Methods of Soil Analysis, Part II, ASA Madison, USA
10. Sehgal, J.2005. Pedology – Concepts and Applications. Kalyani Publishers New Delhi
11. Tisdale,S.L., Nelson,W.L.,Beaton, J.D. and Havlin, J.L. 1995. Soil fertility and Fertilizers. 5th Edn. Macmillan publishing company, US

Course No: 1.7 Course Code: SDC1AG04 (P) Course Name: Fundamentals of Agronomy and Horticulture	Credits:4 Hours per week:4 Total hours: 60
Course Objectives	
1. To develop skill in propagation and cultivation aspects of horticultural crops. 2. To familiarize with cultivation aspects of cereals and millets, pulses and tuber crops.	
Course Outcomes	
CO1- Identification of cereals and millets, pulses, and tuber crops. CO2. Explain the different methods of sowing; direct seeding: broadcasting, dibbling and drilling- transplantation. CO3. Describe the seed treatment - Rhizobium inoculation of leguminous crops. CO4. Identification of manures and fertilizers and their preparation CO5- Explain the fertilizer recommendation and calculation for major cereals and pulses. CO6. Fertilizer recommendation and calculation for major cereals and pulses CO7-Familiarization with green manure crops and cover crops, Different planting systems and layout and the propagation methods	

Contents

1. Identification of cereals and millets, pulses, and tuber crops.
2. Different methods of sowing; direct seeding: broadcasting, dibbling and drilling transplantation.
3. Seed treatment - Rhizobium inoculation of leguminous crops.
4. Identification of manures -organic manures: bulky and concentrated manures

Fertilizers: Straight, complex and mixed fertilizers - identification and preparation.

5. Fertilizer recommendation and calculation for major cereals and pulses.
6. Familiarization with green manure crops and cover crops.
7. Familiarization to Different planting systems and layout
8. Propagation methods - sexual propagation -seed viability tests, dormancy breaking methods.
9. Propagation structures - mist chamber, green house, hot beds etc.
10. Propagation by cuttings.

11. Propagation by layering - types of layering.
12. Propagation by grafting - methods of grafting

Course No: 1**.8** Course Code: SDC1AG05 (P) Course Name**:** Fundamentals of Soil Science	Credits:4 Hours per week:4 Total hours: 60
Course Objectives	
1. To familiarize with soil properties related to crop production 2. To familiarize with soil sampling and estimation of different soil nutrients	
Course Outcomes	
CO1- Identification of soil properties for crop production CO2- How to collect and prepare soil samples CO3. Describing the methods of determination of different nutrient contents in soil	

Contents

1. Soil moisture determination by different methods
2. Determination of Soil moisture constants - Field capacity, PWP
3. Measurement of soil temperature variations
4. Collection and preparation of soil samples
5. Determination of Organic C
6. Determination of soil pH, and electrical conductivity of soil
7. Total elemental analysis -Determination of total N
8. Determination of total P, K
9. Determination of CEC of soils, identification of rocks and minerals

Audit Course 1 (AEC /AC): (Environment Studies)

Module 1

Introduction – Environment in the Indian context: Concept of an ecosystem, Multidisciplinary nature of environmental studies. Components of environment- Atmosphere, hydrosphere, lithosphere and biosphere. Definition, scope and importance. Concept of sustainability and sustainable development.

Module 2

Natural Resources : Renewable and non-renewable resources : Natural resources and associated problems.

(a) Forest resources : Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people.
(b) Water resources : Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
(c) Mineral resources : Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
(d) Food resources : World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. (e) Energy resources : Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies.
(f) Land resources : Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Carbon footprint Water conservation, rain water harvesting, watershed management

Module 3

Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following ecosystem : (a) Forest ecosystem
(b)Grassland ecosystem
(c) Desert ecosystem
(d)Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Module 4

Biodiversity and its conservation, Introduction – Definition : genetic, species and ecosystem diversity, Biogeographical classification of India, Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values, Biodiversity at global, National and local levels., Hot-spots of biodiversity, Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts, Endangered and endemic species of India, Conservation of biodiversity

Module 5

Environmental Pollution Definition, Cause, effects and control measures of :- (a) Air pollution (b)Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution ((f) Thermal pollution (g)Nuclear hazards , Solid waste Management : Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution.

Module 6

Environmental Policies and practices: Climate change, Climate change, Global warming, acid rain, ozone layer depletion, nuclear accidents

SEMESTER II

Course No: 2.4 Course Code: SDC2AG06 Course Name**:** Plantation Crops, Spices and Fruits	Credits:4 Hoursperweek:4 Total hours: 60

Course Objectives

To acquaint with the cultivation aspects of Plantation crops, spices and fruit crops.

To provide technical and scientific cultivation practices of different fruit and plantation crops.

To provide field knowledge and acquaint the students with practical field

Course Outcomes

Explain the importance - area, production ,origin, distribution of plantation crops.

Students will get knowledge on technical cultivation techniques of different fruits and plantation crops.

: Students will able to identify different practical issues related to fruits and planation crops

Analyze the propagation, planting, irrigation ,and manuring of Coconut and Rubber.

Module1 **15 Hrs**

Plantation crops, Introduction - importance - area, production - origin, distribution - botany, varieties - climate, soil, site selection - propagation, production of quality planting materials and hybrids - nursery management - layout, planting, aftercare - irrigation, manuring - stage of harvest, harvesting, yield and uses of :-coconut and Rubber.

Module 2 **12 Hrs**

Plantation crops, Importance - area, production - origin, distribution - botany, varieties - climate, soil, site selection - propagation, production of quality planting materials and hybrids. Nursery management - layout, planting, aftercare - irrigation, manuring - stage of harvest, harvesting, yield and uses of cashew, tea and coffee.

Module 3 **12 Hrs**

Spices, Definition - classification - importance to the state. Origin - distribution - area, production .varieties - climate, soil - propagation, nursery management - site selection, layout, planting - crop management including manuring, irrigation, shade regulation, harvesting, yield of the following crops: Pepper, cardamom, ginger, and nutmeg.

Module 4 **15Hrs**

Fruits, Importance and scope of commercial fruit production - Global scenario of fruit production and export - Present status of fruit production in the state and in the country - problems and prospects.Crop management practices - selection and preparation of planting materials, field preparation and planting, manuring, irrigation, weed management, use of bio-regulators, other cultural operations. Cultural practices for quality improvement. Maturity indices, harvesting, grading, packing, storage and ripening techniques. Industrial and export potential- of Crops- Banana, mango,and pineapple.

Module 5 **6 Hrs**

Fruits, Management practices of crops gaining importance in the state recently (mangosteen, rambutan, durian).

Text books:

1. Chadha, K.L.2001. Hand Book of Horticulture,ICAR, New Delhi.
2. Kumar.N, Abdul Khader.J.B.M.Rangaswami.P. and Irulappan., 1993. Introduction to spices
3. Menon.K.P.V. and Pandalai.K.M. 1960. The coconut Palm - a monograph. Indian Central Coconut Committee, Ernakulam.
4. Purseglove. J.W., Brown, E.G.Green, C.L. and Robbins, S.R.G.1981.SpicesVol-I & II.
5. Pruthi.J.S. 1993.Major Spices of India, Crop Management - Post Harvest Technology, ICAR, New Delhi.
6. Pruthi, J.S.2001 Minor Spices and Condiments-Crop Management and Post HarvestTechnology, ICAR, New Delhi, India.
7. Amar Singh, 1986. Fruit Physiology and Production.Kalyani Publishers, New Delhi.
8. Bose, T.K, Mitra,S.K. and Sanyal, D. 2002. Fruits: Tropical and Subtropical. Vol. I & II, Nayaprakash publications, Calcutta.
9. Hayes,W.B. 1957. Fruit Growing in India.Kitabitan, Allahabad.
10. Kumar, N. 1997 (6^{th} Edition).Introduction to Horticulture.Rajhalakshmi Publications, Nagercoil
11. Mitra,S.K, Bose,T.K and Rathore, D.S. 1991. Temperate Fruits. Horticulture and Allied Publishers , Calcutta.
12. Naik,K.C. 1949. South Indian Fruits and Their Culture.Varadachari Co., Madras.

Course No: 2.5 Course Code: SDC2AG07 Course Name**:** Fundamentals of Seed technology	Credits:4 Hours per week:4 Total hours: 60

Course Objectives

To familiarize with the fundamentals of plant breeding.
To familiarize with the basics of seed technology.
. To strengthen undergraduate student in the field of seed science & technology.
To impart training for entrepreneurship programme .
To initiate basic research related to genetic purity, seed health and seed storage.

Course Outcomes

CO1: Core competency in the subject & comparative evidence on development of seed.

CO2: High analytical ability in understanding the application of scientific principles and students will acquire skills & handling operations of different equipment's in seed science laboratory.

CO3: Develop an understanding of seed development, germination, vigour, deterioration and the relationship between laboratory tests and field performance

CO4: Understand seed increase systems, seed testing and the laws and regulations related to marketing high quality seed.

Module1: Morphology and systematics of crop plants 20 Hrs

General features of important families - morphology of roots, stem, leaves, flowers, fruits and seeds. Introduction to field crops - Classification of field crops. Botany and economic importance of crops like Rice, Ragi, cowpea, Bitter Gourd, Cucumber, Brinjal, Chilli, Tomato, Soybean, coconut, Groundnut, Gingelly, Tapioca, Cotton, Sweet potato, Rubber, Mango, Cashew, Pepper, Papaya and Banana.

Module 2: Principles of Seed Technology 20 Hrs

Introduction to Seed Production, Importance of Seed Production, The concept of a seed-definition- structure of a seed-seed development process, Definition, Characters of good quality seed, Factors affecting seed quality - ecological influences , packing practices, harvest and post-harvest handling, Genetic and agronomic principles of seed production, Seed testing procedures for quality assessment- Physical, Purity, germination and viability test, Principles of establishing a seed testing laboratory, Post-harvest seed management techniques seed extraction-seed processing- drying-cleaning- upgrading-seed blending, Dormancy of seed, role of growth regulators in restoring seed viability, physical agents for increased seed germination, seed vigour etc. Seed treatment, Importance of seed treatment, types of seed treatment, equipment used for seed treatment, Seed packing and seed storage, factors affecting

seed longevity during storage and conditions required for good storage, General principles of seed storage, measures for pest and disease control, temperature control, Seed production of major crops - field crops , plantation crops , fruit plants ,spices, ornamental plants , medicinal plants, Different classes of seeds- Production of nucleus, breeder's seed, foundation and certified seed production, Seed certification, procedure for seed certification, field inspection and field counts etc.,

Module 3: Legislation of Seed Technology **20 Hrs**

Seed Legislation - Seed Act and Seed Act enforcement, Central Seed Committee, Central Seed Certification Board, State Seed Certification Agency, Central and State Seed Testing Laboratories; Seed Act 2000 and other issues related to seed quality regulation, Organizations involved in seed production i.e., public, quasi, cooperative, private etc. Planning seed production programme- seed farm organization-procurement and pricing policy-economics of seed production of different crops; government policy in seed production and study of export potential of seeds.

Text books:

1. Albert F-Hill and O.P. Sharma, 1996.Economic Botany. Tata McGraw - Hill Publishing Company Ltd., New Delhi
2. Chalam, G.V., J. Venkateswarlu. 1966. Agricultural Botany in India-Vol. 1. Asia pulishing house, Bombay, New Delhi
3. Daniel Sundararaj, D and G. Thulasidas, 1993. Botany of field crops. Macmillan India Ltd., New Delhi
4. Allard, R.W. 1960. Principles of Plant Breeding.John Wiley & Sons INC. USA. Toppan Co. Ltd. Japan
5. 4. Choudhari, T.C. 1982. Introduction to Plant Breeding. Oxford A& IBH Publishing Co., New Delhi
6. 5. Elliot. 1958. Plant Breeding &Cytogenetics. Mc Grow Hill. New York
7. Sharma, J.R. 1989. Principles and Practice of Plant Breeding. Tata McGraw - Hill Publishing Company Limited, New Delhi.
8. Singh, B.D. 2001. Fundamentals of Genetics.Kalyani Publishers. New Delhi. Ludhiana
9. Singh, B.D. 2003. Plant Breeding Principles and Methods.Kalyani Publishers.New Delhi/ Ludhiana.
10. Agrawal, R.L. 1995. *Seed Technology*. Oxford, IBH Publishing Co., New Delhi.
11. Bose, T. K. and Som, M. G. 1990. Vegetable crops in India.NayaProkash, Calcutta.
12. Das, P. C.1993. Vegetable crops in India.Kalyani Publishers
13. Dahiya, B.S and Rai, K.N., 1997. *Seed Technology*, Kalyani Publishers.

Course No: 2.6 Course Code: SDC2AG08(P) Course Name**:** Plantation Crops, Spices and Fruits -Practicals	Credits:3 Hours per week:3 Total hours: 45
Course Objectives	
To acquire skill on cultivation aspects of Plantation crops, spices and fruit crops To familiarize with the botanical aspects of field crops. To develop skill in various aspects of seed production	

Course Outcomes
CO1: Demonstrate preparation and application of plant growth regulators to the crops, etc. Investigate the various problems with the production technology of fruit and plantation crops such as disorder, diseases and pests, etc. **CO2**: Distinguish different fruits and plantation crops, symptoms of disorders, diseases, insects and pests, etc. **CO3**: Discuss various concepts of high density planting, new techniques of high density planting, plant propagation, seed propagation, etc. **CO4**: Acquaint the knowledge on the method of field preparation for crop production and arrange the resources required in the field. **CO5:** Apply the production techniques of crops in the practical crop production field. Examine the production of sown crops in the practical crop production field

Plantation Crops

1. Coconut: Nursery techniques, Seedling selection, Production of quality planting materials and hybrids and mother palm selection
2. Familiarization with varieties, Moisture conservation methods in coconut plantations.
3. Layout and planting, care and management of plantations.
4. Tapping systems in rubber.
5. Training and pruning in tea, coffee.

Spices

1. Morphology, nursery techniques, planting in main field, cultural operations and harvesting of pepper, cardamom, ginger, nutmeg

Fruits (Banana, Pineapple and Mango.)

1. Familiarization with important varieties. Practice in propagation, selection of good planting materials, field preparation and planting, manuring and use of growth regulators. Familiarization with weedicides, and plant protection chemicals. Studies on major pests, diseases and nutritional disorders. Studies on maturity indices and storage

Course No: 2.7 Course Code: SDC2AG09(P) Course Name**:** Plantation Crops, Spices and Fruits-practical	Credits:3 Hours per week:3 Total hours: 45
Course Objectives	

- Ensured by adhering to quality checks during production, post production and distribution
- Enhance the knowledge of seed biology, seed quality, seed production, seed storage and seed certification
- Possess sufficient knowledge on seed quality, its production strategy, processing methodology, distribution links and even legal issues.
- Provide students with the methodology of conducting and applying the industrial tests for monitoring seed quality.
- To provide students with steps required for controlling seed quality during seed production in the field.

Course Outcomes

CO1: Acquaint with scope and importance of seed technology in agriculture and the role of officials and legislation, seed act and seed order in quality seed production

CO2: Able to learn the main steps in seed production and certification

CO3: To learn about the important chemical components of seeds and their importance as source of human food and germinating embryo after planting

CO4: Develop an understanding of various seed production techniques for different field crops, the importance of maintenance of purity of crop varieties, and factors causing deterioration of variety.

CO5: Execution of various phases of seed certification, field inspection, and seed purity testing

CO6: Analyze the factors related to genetic and physical purity of seed and its health status of seeds of a variety during seed processing.

Seed technology

1. Introduction to field crops and agricultural classification of field crops.
2. Observing general morphology of roots, stem, leaves, inflorescence, flowers
3. Family characters and Botany and economic parts of the crop plants
4. Microscopy
5. Preparation and use of fixatives and stains for light microscopy
6. Preparation of micro slides
7. Identification of seeds of summer vegetables and cool season vegetables
8. Seed sampling principles and procedures
9. Physical purity analysis of seeds

10. Seed Testing: Germination analysis and viability analysis of seeds
11. Seed dormancy and breaking methods
12. Techniques of hybrid seed production in tropical vegetables
13. Seed extraction techniques
14. Seed treatment against systemic diseases
15. Seed production in rice, Hybrid seed production in rice, coconut

Course No: 2.8 Course Code: SDC2AG10(Pr) Course Name**:** Internship/Project (Cultivation of Crops)	Credits:4 Hoursperweek:4 Total hours: 60
Course Objectives	
To develop skill and to get experience in the cultivation practices of various crops Provides opportunities for the students to attach with the agri related industries and make them know about the functioning them. Students will be oriented with the principles of crop planning and selection of crop Students will be given practical experience on raising of crops in their field with special emphasis on the agronomic management of the crop Familiarized with the calculation of economics of crop cultivation	
Course Outcomes	
Acquaint with the knowledge of principles of crop planning and selection of crop Developed the field experience on raising of crops in their field with special emphasis on the agronomic management of the crop familiarized with the calculation of economics of crop cultivation Demonstrate the ability to apply the scientific method to problems in crop	

Work planned:

Familiarisation with seedling/sucker selection, land preparation, pit making and planting, Nutrient management, irrigation and other intercultural operations, pest and disease management aspects by allotting each student with different crops.

AUDIT COURSE – 2nd SemesterDISASTER MANAGEMENT(AUD2E02)

MODULE 1

Introduction – Hazard and Disaster. Concepts of Hazard, Vulnerability, Risks. Different Types of Disaster: **A)** Natural Disaster: such as Flood, Cyclone, Earthquakes, Landslides etc. **B)** Manmade Disaster: such as Fire, Industrial Pollution, Nuclear Disaster, Biological Disasters, Accidents (Air, Sea, Rail & Road), Structural failures (Building and Bridge), War & Terrorism etc. Slow Disasters (famine, draught, epidemics) and Rapid Onset Disasters (Air Crash, tidal waves, Tsunami) Causes, effects and practical examples for all disasters. Water and Climate Disaster: flood, hail storms, cloudburst, cyclones, heat and snow avalanches, cold waves, droughts, sea erosion, thunder and lightning. Geological Disaster: landslides, earthquakes, Tsunami, mine fires, dam failures and general fires. Biological Disaster: epidemics, pest attacks, cattle epidemic and food poisoning. Nuclear and Industrial Disaster: chemical and industrial disasters, nuclear accidents. Accidental Disaster: urban and forest fires, oil spill, mine flooding incidents, collapse of huge building structures.

MODULE 2

Natural disasters- Earthquakes, Tsunami, Floods, Drought, Landslides, Cyclones and Volcanic eruptions. Their case studies. Coastal disasters. Coastal regulation Zone. Risk and Vulnerability Analysis **1.** Risk: Its concept and analysis **2**. Risk Reduction **3**. Vulnerability: Its concept and analysis **4**. Strategic Development for Vulnerability Reduction. Disaster Prevention and Mitigation. Refugee operations during disasters, Human Resettlement and Rehabilitation issues during and after disasters, Inter-sectoral coordination during disasters, Models in Disasters.

MODULE 3

Disaster Preparedness and Response Concept and Nature Disaster Preparedness Plan Prediction, Early Warnings and Safety Measures of Disaster. Role of Information, Education, Communication, and Training, Disaster Management: Role of Government, International and NGO Bodies. Role of IT in Disaster Preparedness Role of Engineers on Disaster Management. Response Disaster Response: Introduction Disaster Response Plan Communication, Participation, and Activation of Emergency Preparedness Plan Search, Rescue, Evacuation and Logistic Management Role of Government, International and NGO Bodies Psychological Response and Management (Trauma, Stress, Rumor and Panic) Relief and Recovery Medical Health Response to Different Disasters.

MODULE 4

Rehabilitation, Reconstruction and Recovery Reconstruction and Rehabilitation as a Means of Development. Damage Assessment Post Disaster effects and Remedial Measures. Creation of Long-term Job Opportunities and Livelihood Options, Disaster Resistant House Construction Sanitation and Hygiene Education and Awareness, Dealing with Victims' Psychology, Longterm Counter Disaster Planning Role of Educational Institute.

MODULE 5

The vulnerability atlas of India. Disaster Prevention and Mitigation. Agencies involved in

Disaster Management. Warning and Prediction

ESSENTIAL READING:

1. Pandey, M., 2014. Disaster Management, Wiley India Pvt. Ltd., 240p.
2. Tushar Bhattacharya, Disaster Science and Management, McGraw Hill Education (India) Pvt. Ltd
3. Jagbir Singh, Disaster, Management: Future Challenges and Opportunities, K W Publishers Pvt. Ltd.
4. J.P. Singhal, Disaster Management, Laxmi Publications
5. C. K. Rajan, NavalePandharinath, Earth and Atmospheric Disaster Management : Nature and Manmade, B S Publication
6. Shailesh Shukla, ShamnaHussain, Biodiversity, Environment and Disaster Management, Unique Publications

SEMESTER III

Course No. 3.1 Course Code: A11 Course Title: Biodiversity- scope and relevance	Credits: 4 Total Contact Hrs: 72 Hrs

Unit 1 Defining Biodiversity (Hours: 12)

The concept of biodiversity. Biodiversity crisis. Importance of biodiversity in daily life. Biodiversity and climate change. India as mega biodiversity nation. Hot spots of biodiversity in India.

Unit 2 Components of Biodiversity. (Hours: 12)

Genetic diversity, species diversity and ecosystem diversity. Brief outlines of the magnitude of bacterial, fungal, protist, animal and plant diversity.

Unit 3 Loss of Biodiversity (Hours: 12)

Factors causing loss of genetic-, species- and ecosystem diversity. Processes responsible for species extinction. Threatened species and IUCN Red List categories. Loss of agrobiodiversity.

Significance of wild relatives of cultivated plants and domesticated animals.

Unit 4 Values and uses of biodiversity (Hours: 12)

Ethical and aesthetic values of biodiversity. Direct and indirect economic benefits of biodiversity. Bio-prospecting – micro-organisms and plants as a source of novel enzymes, antibiotics, antiviral agents, Immunosuppressive agents and other therapeutic agents.

Unit 5 Inventorying and Monitoring of Biodiversity (Hours: 12)

The need for inventorying and monitoring of biodiversity. Methods of inventorying and monitoring of biodiversity and their limitations.

Unit 6 Conservation of biodiversity (Hours: 12)

Conservation of genetic-, species- and ecosystem diversity. In situ and ex situ conservations:

biosphere reserves, national parks, wild-life sanctuaries, gene banks, seed banks, botanical

gardens, microbial culture collections.

SUGGESTED READING

1. Patent, D. H., Munnoz W. 1996. Biodiversity. Clarion Books.

2. Maiti, P. K., Maiti, P. 2011. Biodiversity: Perception, Peril and Preservation. Prentice Hall

India.

3. Maclaurin, J. 2008. What is biodiversity? University of Chicago Press.

4. Krishnamurthy, K. V. 2003. Textbook of Biodiversity. SciencePublishers Inc.

5. Wilson E. O. 2010. The Diversity of Life. Harvard University Press.

6. Hosetti B.B., Ramkrishna, S. 2016. Biodiversity: Concepts and Conservation. Aavishkar

Publishers.

7. Kumar A. 2011. Understanding Biodiversity. Discovery Publishing House.

8. Hendon, J. 2017. Textbook of Biodiversity. Syrawood Publishing House.

9. Adom, D. Umachandran, K., Ziarati, P., Sawicka, B., Sekyere, P. 2019. The Concept of Biodiversity and its Relevance to Mankind: A Short Review. Journal of Agriculture and Sustainability 12(2): 219-231.

10. Ehrlich, P.R., Ehrlich, A.H. 1992. The Value of Biodiversity. Stanford University Press.

Course No. 3.2 **Course Code: A12** **Course Title: Research Methodology**	**Credits: 4** **Total Contact Hrs: 72 Hrs**

Unit I (Hours: 13)

Topic selection - Planning research – defining objectives - Preparation of work plans.

Identification of suitable methodology - Preparation of project proposal –Summer Schools – Training in research institutes

Unit II (Hours: 14)

Collection of literature- News articles – Newsletters – Magazines – Books - Journals. Digital library and search of articles - Keywords and search - Internet – Google Scholar – PubMed – Inflibnet – Medline – Agricola – Science direct -Open access Journals - virtual sources – other sources. Short communications –review articles

Unit III (Hours: 15)

Collection of protocols and selection of suitable methods according to work plan. Observational

and experimental research. Data analysis – Construction of tables – headings - footer -

Tabulation – Presentation of results - Use of statistical software to analyze the results- SPSS.

Unit IV (Hours: 15)

Thesis structure –Components - Writing Introduction – review of literature – Materials & Methods – Presentation of results – Discussion of Results based on literature – Arriving at conclusions – Preparation of Summary/abstract – Arrangement of Bibliography and how to quote reference in thesis - Appendix.

Unit V (Hours: 15)

Publishing of Articles in newspapers /newsletters - Selection of journals – ISSN Number – Peer reviewed

Journals – Science citation index – impact factor and importance. Manuscripts

preparation for Journals – components – Plagiarism - Submission and Publication – reprints and

pdf formats. Paper presentation in Conferences.

SUGGESTED READING

1. Anderson, Durston & Polle 1970: Thesis and assignment, writing. Wiley Eastern Limited.
2. Booth W. C. et al. 2016. The Craft of Research. University of Chicago Press.
3. Rajendrakumar C. 2008. Research Methodology. APH publishing Corporation.
4. Kothari C. R. 2004. Research Methodology. New Age International Publishers.
5. Gurumani, N. 2006. Research Methodology for Biological Sciences. MJP. Publishers.
6. Marczyk, G., DeMatteo, D., Festinger, D. 2005. Essentials of research design and methodology. John Wiley.
7. Katz, M. J. 2009. From Research to Manuscript: A Guide to Scientific Writing. Springer.
8. Michael Alley. The Craft of Scientific Writing (3rd Edition) Publisher: Springer.

9. Cargill, M., O.Connor, P. 2013. Writing Scientific Research Articles: Strategy and Steps.
Wiley-Blackwell.
10. Blake, G. and Bly, R. W. 2000. The Elements of Technical Writing. Pearson.
11. Reep, D. C. 2014. Technical Writing: Principles, Strategies, and Readings. Longman.

Course No. 3.3 **Course Code: SDC3AG11** **Course Title: Plant Tissue Culture and Biotechnology**	**Credits: 4** **Total Contact Hrs: 60 Hrs**
Objectives • To build theoretical foundation in plant tissue culture and biotechnology.	
Course Outcomes CO1- Describe the principles and techniques of plant tissue culture	
CO2- Explain the Tissue culture medium	
CO3- Describe the preparation of explants and different methods of micropropagation	

CO4- Explain the different phases of micropropagation
CO5- Explain the methods and applications of tissue culture
CO6- Describe the recombinant DNA Technology
CO7- Explain the cloning vectors and PCR
CO8- Describe the different methods of gene transfer

Plant tissue culture

Module-1 (20 hours)

1. Plant tissue culture – Principles and techniques; Cellular totipotency; *invitro* differentiation – de differentiation and re-differentiation.

3. Tissue culture medium – Basic components in tissue culture medium – Solid and liquid medium; Murashige and Skoog medium – composition and preparation.

4. Aseptic techniques in *in vitro* culture – sterilization – different methods –sterilization of instruments and glassware, medium, explants; workingprinciple of laminar air flow and autoclave.

5. Preparation of explants – surface sterilization, inoculation, incubation, subculturing.

6. Micropropagation - Different methods – apical, axillary bud proliferation, direct and indirect organogenesis and somatic embryogenesis.

7. Different phases of micropropagation – multiple shoot induction, shoot elongation, *in vitro* and *in vivo* rooting hardening, transplantation and field evaluation; Advantages and disadvantages of micropropogation. Somaclonal variation.

Module – II (15 hours)

1. Methods and Applications of tissue culture:

1. Shoot tip and meristem culture
2. Somatic embryogenesis and synthetic seed production
3. Embryo culture
4. Protoplast isolation culture and regeneration – transformation and transgenics
5. Somatic cell hybridization, cybridization.
6. *In vitro* secondary metabolite production — cell immobilization, bioreactors
7. *In vitro* production of haploids – anther and pollen culture
8. *In vitro* preservation of Germplasm

Biotechnology

Module –I (15 hours)

1. Recombinant DNA Technology: Gene cloning strategies – recombinant DNA construction

– cloning vectors – plasmids- Ti plasmids, pBR322, bacteriophage based vectors.

Restriction endonucleases and ligases- transformation and selection of transformants

– using antibiotic resistance markers. Blotting techniques; PCR.

2. Different methods of gene transfer – chemically stimulated DNA uptake by protoplast,

electroporation, microinjection, biolistics. Agrobacterium mediate gene transfer- gene library, gene banks.

Module –II (10 hours)

1. Application of Biotechnology in:

a. Medicine - Production of human insulin, human growth hormones.

b. Forensics - DNA finger printing.

c. Agriculture - Genetically modified crops – Bt crops, Golden rice, Flavr Savr tomato, herbicide resistant crops, edible vaccines.

d. Environment- Bioremediation- use of genetically engineered bacteria- super bugs.

e. Industry- Horticulture and Floriculture Industry, production of vitamins, amino acids and alcohol.

Textbooks

1. Bhojwani, S.S. and Razdan, S.K. 1993. *Plant tissue culture: Theory and Practice*. Elsever Science Publications, Netherlands.

2. Chawla, H.S.2012. *Introduction to plant biotechnology*. IBH publishing Co.

3. Christou, P. and Klee, H. (eds.). 2004. *Handbook of Plant Biotechnology*.Wiley, 768 p.

4. Smith, H.R. 2013. *Plant tissue culture –Techniques and Experiments* (third Ed). Elsevier. 188 p.

5. Singh, B. D. 2013. *Molecular biology, genetic engineering and applications of biotechnology*. Kalyani Publishers.

6. Slater, A., Scott, N. and Fowler, M. 2003. *Plant biotechnology: the genetic manipulation of plants.* Oxford University Press, 346 p.

Course No. 3.4 **Course Code: SDCAG12** **Course Title: Integrated Pest Management in Crops**	**Credits: 4** **Total Contact Hrs: 60 Hrs**
Objectives • To develop knowledge on the theoretical basis of integrated pest management.	
Course outcomes CO1- Describe the concepts, principles and tools of IPM	
CO2- Explain the different types of IPM Methods	
CO3- Describe the important groups of microorganisms used in insect pest control.	
CO4- Explain the mass multiplication techniques of important biocontrol agents	

Module 1 **12 Hrs**

IPM- introduction, importance, concepts, principles. Tools of IPM- Host plant resistance,

definition, mechanisms of resistance, compatibility with other pest management practices -merits and demerits.

Module 2 **12Hrs**

IPM Methods- Cultural methods, Mechanical methods, Physical and Legislative methods, Biological methods- definition, methods, advantages, limitations. Natural enemies- parasites,predators and microorganisms used in pest control.

Module 3 **12 Hrs**

Important groups of microorganisms-bacteria, viruses and fungi used in insect pest control.Mass multiplication techniques of important biocontrol agents.

Module 4 **12 Hrs**

Chemical control - importance, hazards and limitations. Classification of insecticides based onchemical nature- insecticides of plant origin (botanical insecticides) and Synthetic insecticides.

Preparation of neem oil garlic emulsion and tobacco decoction. Formulations of insecticides andcalculation of quantity of formulations for field application. Synthetic insecticides -organophosphates, carbamates, synthetic pyrethroids. Plant protection equipment -Classification- and working principles- parts of sprayers, dusters and uses.

Module 5 **12 Hrs**

Distribution, host-range, symptoms of damage and management practices for major pests of the following Crops-Rice, Coconut, Banana, Cashew, Pepper, cardamom, Brinjal, Bitter gourd and cowpea.

Text books:

1. Mani, M. S. 1968. General Entomology. Oxford and IBH Publishing Company, New Delhi.

2. Nayar, K. K., Ananthakrishnan T. N. and David.B.V. 1976. General and Applied Entomology, Tata McGraw Hill Publishing Company Limited, New Delhi.

3. Pedigo, L. P. 1999. Entomology and Pest Management. Third Edition. Prentice Hall, New Jersey, USA.

4. Richards, O.W. and Davies, R. G. 1977.Imm's General Text Book of Entomology, Vol.1&2, Chapman and Hall Publication, London.

5. Srivastava, P. D. and Singh, R. P. 1997.An Introduction to Entomology, Concept Publishing Company, New Delhi.

6. Dhaliwal, G. S. and Ramesh Arora. 1998. Principles of Insect Pest Management. Kalyani Publishers, New Delhi.

Course No. 3.5 **Course Code: SDCAG13** **Course Title: Fundamentals of Agricultural Engineering**	**Credits: 4** **Total Contact Hrs: 60 Hrs**

Objectives

1. To familiarize with fundamentals of water management.
2. To acquaint with various soil conservation methods.

Course outcomes

CO1- Describe the irrigation with definition and objectives

CO2-Explain the methods of irrigation and their engineering aspects

CO3- Describe the agronomic techniques to improve water use efficiency

CO4-Describe the soil erosion and its relative aspects

CO5-Describe the water harvesting techniques - in situ and ex situ methods

CO6- Explain surveying: survey equipment, chain survey, cross staff survey, plotting procedure, calculations of area of regular and irregular fields.

MODULE 1 **12 Hrs**

Irrigation: definition and objectives. Role of water in soil and plants- Irrigated agriculture vs. Rainfed agriculture, dry farming and dryland farming-definition.

MODULE 2 **12 Hrs**

Methods of determining water requirement-effective rainfall. Methods of irrigation and their engineering aspects - surface irrigation, sprinkler, drip - Agronomic techniques to improve water use efficiency- factors affecting water use efficiency.

MODULE 3 **12 Hrs**

Soil erosion- nature and extent of erosion; types- soil erosion by water- different forms- Soil conservation vs. water conservation - agronomic measures- mechanical measures- Role of grasses and pastures in soil conservations; Wind breaks and shelter belts.

MODULE 4 **12 Hrs**

Water harvesting techniques - in situ and ex situ water harvesting methods - Farm ponds, percolation ponds or wells, check basin, minor irrigation tanks.

MODULE 5 **12 Hrs**

Surveying: survey equipment, chain survey, cross staff survey, plotting procedure, calculations of area of regular and irregular fields.

Text books:

1. Dhruvanarayana, V.V. 1993.*Soil and Water Conservation Research in India*. ICAR, New Delhi.

2. Gurmel Singh, C. Venkataraman, G., Sastry,B. and Joshi, P. 1990.*Manual of Soil and Water Conservation Practices*. Oxford and IBH Publishing Co., New Delhi.

3. Hansen, V.Eh.,Israelsen, O.W., and Stringham, G.E. 1979. *Irrigation Principles and Practices* (4th Ed.). John Wiley and Sons, New York.

4. Lenka, D. 2001.*Irrigation and Drainage*. Kalyani Publishers, New-Delhi.

5. Mal, B. C.2002.*Introduction to Soil and Water Conservation Engineering,* KalyaniPublishers, New-Delhi.

6. Michael, A.M and Ojha, T.P. 2005.*Principles of Agricultural Engineering*-Vol.II.Jain Brothers, New Delhi.

7. Michael, A.M. 1988.*Irrigation Theory and Practice*.Vikas Publishing House Pvt. Ltd., New Delhi.

Course No. 3.6 Course Code: SDCAG14 (P) Course Title: Agricultural Engineering- Practicals	Credits: 4 Total Contact Hrs: 60 Hrs
Objectives 1. To familiarize with fundamentals of water management	

Contents

1. Study of soil loss by multi slot device
2. Estimation of runoff -problems
3. Study of water flow measuring devices
4. Study of water harvesting techniques
5. Study of ground water recharge techniques
6. Design of water harvesting ponds
7. Problems on drip irrigation systems
8. Problems on sprinkler irrigation systems
9. Study of fertigation equipments
10. Irrigation pump selection - problems
11. Field visit

Course No. 3.7 Course Code: SDCAG15 (P) Course Title: Micropropagation of plants- Practicals	Credits: 4 Total Contact Hrs: 75 Hrs

Course outcomes

CO1-Explain the requirements for Plant Tissue Culture laboratory and media components and preparations.

CO2- Describe the preparation and sterilization of media and aseptic manipulation and inoculation of various explants

CO3- Explain the micro propagation of important crops

CO4- Describe the preparation of synthetic seeds

CO5- Explain the demonstration of anther culture and embryo culture.

1. Requirements for Plant Tissue Culture Laboratory.

2. Media components and preparations.
3. Preparation and sterilization of media.
4. Aseptic manipulation and inoculation of various explants.
5. Callus induction, subculturing and plant regeneration.
6. Micro propagation of important crops.
7. Preparation of synthetic seeds.
8. Demonstration of Anther culture.
9. Demonstration of embryo culture.
10. Hardening/ acclimatization of regenerated plants.

Course No. 3.8 **Course Code: SDCAG16 (P)** **Course Title: Integrated Pest Management- Practicals**	**Credits: 4** **Total Contact Hrs: 75 Hrs**
Objective- Familiarization with methods of pest control	

Contents

1. Familiarization with Mechanical methods of pest control.
2. Identification of predators.
3. Identification of microbial agents.
4. Familiarization with different formulations of insecticides.
5. Preparation of neem oil garlic emulsion and tobacco decoction.
6. Familiarization with different insecticides.
7. Calculation of doses/concentrations of insecticides.
8. Preparation of spray fluid for field application.
9. Familiarization with Plant protection equipment.
10. Identification, symptoms of damage, collection and preservation of pests of:

a) Rice, Coconut.
b) Banana, Cashew.
c) Pepper, cardamom.
f) Brinjal, Bittergourd and cowpea

AUDIT COURSE – 3rd SEMESTER (AUD3E03) Human Rights
SYLLABUS

Module I - INTRODUCTION TO HUMAN RIGHTS

Evolution, Nature, Philosophical and Historical foundation of Human Rights, National Human Rights Commission, State Human Rights Commission

Module II – CONSTITUTION OF INDIA AND FUNDAMENTAL RIGHTS

Right to Equality, Right to Freedom, Right against Exploitation, Right to Freedom of Religion,

Cultural and educational rights, Rights to Constitutional Remedies.

Module III - INTERNATIONAL HUMAN RIGHTS

Evolution of human rights and duties on the international plane, The United Nations Charter and the development of human rights Provisions of the Charter, Universal Declaration of Human Rights 1948, International Covenant on Civil and Political Rights 1966 and other major UN instruments on human rights (Conventions on Women's Rights, Rights of the Child, Torture)

Module IV - HUMAN RIGHTS COMMISSION FOR WOMEN AND CHILDREN

Women Rights - National Commission for Women (NCW), Kerala Women Commission (KWC), Legal Aid for Women, Laws for protection of women
Child Rights - National Child Rights Protection Council, National Commission for Protection of Protection of Child Rights (NCPCR), Legal Aid, LokAdalats, Public Interest Litigation Laws for the Protection and Care of Children

Module V - HUMAN RIGHTS FOR MINORITIES, SC AND ST

Special Laws and Policies: National Commission for Minorities Act (1992). Minority Rights in India, The Nation- Building Project and Minorities, Communal Mobilization and Minority's Rights. National Commission for Scheduled Tribes (NCST), National Commission for Scheduled Castes (NCSC)

SEMESTER IV

Course No. 4.1 **Course Code: A13** **Course Title: Natural Resource Management**	**Credits: 4** **Total Contact Hrs: 72 Hrs**

Unit 1: Introduction to natural resources (Hours: 8)
Definition of natural resources. Types of natural resources. Need for protecting natural resources
Unit 2: Sustainable utilization (Hours: 8)
Concept of sustainable utilization. Economic, ecological and socio-cultural approaches.
Unit 3: Land (Hours: 8)
Agricultural, pastoral, horticultural and silvicultural land utilization. Soil degradation and soil management.
Unit 4: Water (Hours: 8)
Fresh water (rivers, lakes, groundwater); Marine; Estuarine; Wetlands; Threats and management strategies.
Unit 5: Biological Resources (Hours: 8)

Biodiversity-definition and types; Significance; Threats; Management strategies. Bioprospecting. National Biodiversity Action Plan.

Unit 6: Forests (Hours: 8)

Definition. Types of forests. Forest cover and its significance (with special reference to India); Major and minor forest products; Forest depletion. Forest Management.

Unit 7: Energy (Hours: 8)

Renewable and non-renewable sources of energy.

Unit 8: Contemporary practices in natural resource management (Hours: 8)

Environmental Impact Assessment, Remote Sensing, Geographic Information System, Participatory Resource Appraisal. Ecological footprint with emphasis on carbon footprint. Resource Accounting. Waste management.

Unit 9: National and international efforts in natural resource management and conservation (Hours: 8)

SUGGESTED READING

1. Singh K. K. 2008. Natural Resources Conservation & Management. M D Publications Pvt. Ltd.
2. Singh, J. S., Singh, S.P. and Gupta, S. 2006. Ecology, Environment and Resource Conservation. Anamaya Publications.
3. Rogers, P.P., Jalal, K.F. and Boyd, J.A. 2008. An Introduction to SustainableDevelopment. Prentice Hall of India.
4. Pandey, B. W. 2005. Natural Resource Management. Mittal Publications.
5. Lynch D. R. 2011. Sustainable Natural Resource Management. Cambridge University Press.
6. Nuberg, I., George, B., Reid, R. 2009. Agroforestry For Natural Resource Management. CSIRO Publishing.
7. Camp, W. G., Heath-Camp, B. 2016. Managing Our Natural Resources. Cengage Learning Pte. Ltd
8. Chiras, D. D., Reganold, J. P. 2009. Natural Resource Conservation: Management for a Sustainable Future. Pearson.
9. Campbell, B. M., Sayer, J. A. 2003. Integrated Natural Resource Management: Linking Productivity, the Environment and Development. CABI Publishing.
10. Deal, K. H. 2011. Wildlife and Natural Resource Management. Delmar Cengage Learning.

Course No. 4.2 **Course Code: A14** **Course Title: Intellectual Property Rights**	**Credits: 4** **Total Contact Hrs: 72 Hrs**

Module 1: Overview of intellectual property (Hours: 4)
Introduction and the need for intellectual property right (IPR). IPR in India – Genesis and Development. Some important examples of IPR.

Module 2: Patents (Hours: 10)
Macro-economic impact of the patent system. Patent and kind of inventions protected by a
patent. Patent document. How to protect your inventions? Granting of patent. Rights of a patent. How extensive is patent protection? Why protect inventions by patents? Searching a
patent. Drafting of a patent. Filing of a patent

Module 3: Copyright (Hours: 10)
What is copyright? What is covered by copyright? How long does copyright last? Why protect copyright?
Related rights: What are related rights? Distinction between related rights and copyright. Rights covered by copyright.

Module 4: Trademarks (Hours: 14)

Definition of trademark. Rights of trademark. Kinds of signs that can be used as trademarks.
Types of trademark. Function that a trademark performs. How is a trademark protected? How
is a trademark registered? How long is a registered trademark protected for? How extensive is
trademark protection? What are well-known marks and how are they protected? Domain name and how does it relate to trademarks?

Module 5: Geographical Indications (Hours: 4)
What is a geographical indication? How is a geographical indication protected? Why protect
geographical indications?

Module 6: Industrial Designs (Hours: 10)
What is an industrial design? How can industrial designs be protected? What kind of protection is provided by industrial designs? How long does the protection last? Why protect
industrial designs?

Module 7: Biotechnology and IPR (Hours: 20)
Rationale for Intellectual Property Protection in biotechnology. Concept of Novelty in Biotechnological Inventions. Concept of Inventive Step in Biotechnological Inventions. Microorganisms as Biotechnological Inventions. Patenting biological inventions. Patenting
microorganisms. Patenting other biological processes and products. Protection of new varieties of plants. Justification for Protection. Biotechnology and International Treaties such
as Convention on Biological Diversity and TRIPs.

SUGGESTED READING

1. T. M Murray, M.J. Mehlman. 2000. Encyclopaedia of Ethical, Legal and Policy issues in Biotechnology, John Wiley & Sons.
2. P.N. Cheremisinoff, R.P. Ouellette and R.M. Bartholomew.1985. Biotechnology Applications and Research, Technomic Publishing Co., Inc.
3. D. Balasubramaniam, C.F.A. Bryce, K. Dharmalingam, J. Green and K. Jayaraman, 2002. Concepts in Biotechnology, University Press (Orient Longman Ltd.).
4. Bourgagaize, Jewell and Buiser. 2000. Biotechnology: Demystifying the Concepts, Wesley Longman.
5. Ajit Parulekar, Sarita D' Souza. 2006. Indian Patents Law – Legal & Business Implications; Macmillan India,
6. B.L. Wadehra. 2000. Law Relating to Patents, Trade Marks, Copyright, Designs & Geographical Indications; Universal law Publishing Pvt. Ltd.
7. P. Narayanan. 2010. Law of Copyright and Industrial Designs; Eastern law House.

8. N.S. Gopalakrishnan, T.G. Agitha. 2009. Principles of Intellectual Property. Eastern Book Company.
9. T. Ramakrishan (Ed.). 2003. Biotechnology and Intellectual Property Rights. CIPRA, NLSIU, Bangalore.
10 N.K. Acharya. 2012. Text Book on Intellectual Property Rights, 6th ed. Asia Law House.
11 M. M. S. Karki. 2009. Intellectual Property Rights: Basic Concepts. Atlantic Publishers.
12 N. S. Sreenivasalu. 2007. Intellectual Property Rights. Neha Publishers & Distributors.
13 Pal P. 2008.Intellectual Property Rights in India: General Issues and Implications. Regal Publications

Course No. 4.3 **Course Code: SDCAG17** **Course Title: Protected Cultivation of Crops**	**Credits: 4** **Total Contact Hrs: 60 Hrs**
Objectives • To familiarize with protected cultivation structures and cultivation practices	
Course outcomes CO1- Describe the introduction, scope and important of problems and prospects of protected culture in India CO2- Explain the basic considerations in establishment and operation of greenhouses CO3- Explain the environmental control systems in green house. CO4- Describe the type of containers used in protected culture CO5- Explain the use of substrate and preparation of substrate for protected cultivation CO6- Describe the Crop regulation CO7- Explain the harvesting methods	

Module1 **12 Hrs**

Introduction - scope and importance - problems and prospects of protected culture in India - growing structures - green house - polyhouse - net house - basic considerations in establishment and operation of greenhouses - maintenance .

Module 2 **12 Hrs**

Advantages of growing plants in a greenhouse - functioning and maintenance. Manipulation of environmental factors - environmental control systems in green house. Maintenance of cooling and heating system in green houses.

Module 3 **12Hrs**

Type of containers used in protected culture. Substrate -Use of substrate and preparation of

substrate for protected cultivation, soil decontamination. Water management- nutrient management (fertigation).

Module 4 **12 Hrs**

Crop regulation - special horticultural practices in protected cultivation for commercially important crops: vegetable crops, flowering plants, seedlings, etc

Module 5 **12Hrs**

Harvesting methods - postharvest handling - standards - grading - packing and marketing.

Suggested Readings:

1. Foja Singh., 1997. Advances in Floriculture.Media Today Pvt. Ltd., New Delhi-17.
2. Prasad, S. and U.Kumar. 1998. Commercial floriculture. Agro Botanica. Bikaner - 334 004.
3. Roy. A. Larson., 1992. Introduction of Floriculture.International Book Distributing Co., Lucknow.
4. Vishnu Swarup., 1997. Ornamental Horticulture.Macmillan India Ltd., New Delhi-2.Wltez,
S., 1972.The world gladiolus, NAGG, USA.
5. Yadav, L.P. and Bose, T.K., 1986. Biology, conservation and culture of orchids. East-West
Press Private Limited, New Delhi.E.
6. Yadav.I.S. and M.L. Choudhary., 1997.Progressive floriculture.The House of Sarpan, (Media), Bangalore.

Course No. 4.4 **Course Code: SDCAG18** **Course Title: Weed Management and Fodder Crop Production**	**Credits: 4** **Total Contact Hrs: 60 Hrs**
Objectives 1.To understand the general characters of weeds and their management 2.To acquaint with cultivation of rice, fibre crops, fodder crops, etc.	
Course outcomes CO1- Explain the classification, propagation and dissemination of weeds CO2- Describe the Integrated weed management CO3- Describe the herbicide classification, formulations, methods of application. CO4- Describe the soil and climatic requirement , varieties, cultural practices , harvesting and postharvest off major oil crops CO5- Explain the Crop Production in rice CO6- Describe the mechanised farming in rice CO7- Describe the cultivation and management of fodder crops	

MODULE 1 **15 Hrs**

Weeds: Introduction, harmful and beneficial effects, classification, propagation and

dissemination. Concepts of weed prevention, control and eradication; Methods of weed control: physical, cultural, chemical and biological methods. Integrated weed management (IWM); Herbicides: advantages and limitation of herbicide usage in India, Herbicide classification, formulations, methods of application.Compatibility of herbicides with other agro chemicals; Weed management in rice, banana, pineapple, coconut, rubber, vegetables.Aquatic and problematic weeds and their control.

MODULE 2 **15 Hrs**

Origin, geographic distribution, economic importance, soil and climatic requirement , varieties, cultural practices , harvesting and postharvest handling of major Oilseeds , Sugar cane, Fibre crop, Narcotics ,Medicinal plants.

MODULE 3 **10 Hrs**

Crop Production in rice in detail: Methods of sowing, Varieties and their duration, various systems of rice cultivation. Raising of nursery, sowing in the main field, Nutrient and water management. Weed Management in rice. Harvest indices in rice.

MODULE 4 **10 Hrs**

Mechanised farming in Rice. Introduction to various machines employed in mechanised rice cultivation including field preparation, weeding and harvesting.

MODULE 5 **10 Hrs**

Fodder crops: their cultivation and management.

Text books:

1. Agarwal, P.C. 1990.Oilseeds in India. Oxford and IBH, New Delhi
2. Balasuramaniyan, P. and Palaniappan, SP. 2003.Principles and Practices of Agronomy.Agrobios(India)
3. Barnes, A.C. 1964.The Sugarcane.Interscience Publishers, New Delhi
4. ChiddaSnidngh, Prem Singh and Rajbir Singh.2003. Modern Techniques of Raising Field Crops (2 Ed.). Oxford &IBH, New Delhi.
5. ICAR [Indian Council of Agricultural Research].2006. Hand Book of Agriculture. ICAR, New Delhi
6. KAU [Kerala Agricultural University].2007.Package of Practices Recommendations - Crops. Directorate of Extension, Kerala Agricultural University, Thrissur
7. Lekshmikantan, M. 1983.Technology in Sugarcane Growing. Oxford & IBH Publishing Co., Pvt. Ltd., New Delhi
8. Prasad, R. (Ed.). 2001. Field Crop Production. ICAR, New Delhi
9. Purseglove, J.W. 1975. Tropical Crops: Monocotyledons. The English Language Book Society and Longman, London
10. Thomas, J., Joy, P.P., Mathew, S., Skaria, B.P., Duethi, P.P. and Joseph, T.S. 2000.Agronomic Practices for Aromatic and Medicinal Plants.Directorate of Arecanut and Spices Development, Kozhikode.
11. Yadav, D.S. 1992. Pulse Crops. Kalyani Publishers., New Delhi.
12. Gurmel Singh, C. Venkataraman, G., Sastry,B. and Joshi, P. 1990.Manual of Soil and Water Conservation Practices. Oxford and IBH Publishing Co., New Delhi.
13. IARI [Indian Agricultural Research Institute]. 1977. Water Requirement and Irrigation
14. Management of Crops in India, IARI Monograph No.4, Water Technology Centre, IARI, New-Delhi.

15. Lenka, D. 2001.Irrigation and Drainage.Kalyani Publishers, New-Delhi.
16. Mal, B. C.2002. Introduction to Soil and Water Conservation Engineering,Kalyani
17. Michael, A.M. 1988.Irrigation Theory and Practice.Vikas Publishing House Pvt. Ltd., New
Delhi.
18. Mishra, R.D. and Ahamed, M. 1993.Manual of Irrigation Agronomy.Oxford and IBH Publishing Company Pvt. Ltd.
19. Prihar, S.S. and Sandhu, B.S. 1987. Irrigation of Field crops - Principles and Practices - ICAR, New-Delhi.
20. SankaraReddi, G.H. and Yellamanda Reddy, T.2003 Efficient Use of Irrigation Water. Kalyani Publishing House, New Delhi.
21. Tideman, E.M. 1996. Watershed Management: Guidelines for Indian Conditions. Omega Scientific Publishers, New Delhi.
22. Aldrich, R.J. and Kramer, R.J. 1997.Principles in Weed Management.Panama Publications,
New Delhi.
23. Anderson, P.W. 1983. Weed Science - Principles. West Publishing Con.d New York
24. Ashton, P.M. and Crafts, A.S. 1981. Mode of Action of Herbicides (2 Ed.) Wiley- Inter Science, New York.

Course No. 4.5 **Course Code: SDCAG19** **Course Title: Livestock Farming**	**Credits: 4** **Total Contact Hrs: 60 Hrs**
Objectives 1. To familiarize with fundamentals of livestock farming. 2. To acquaint with the management of various farms.	
Course Outcomes CO1- Describe the role of Livestock in National economy	
CO2- Describe the general management Practices in Dairy farming	
CO3- Describe the cattle and buffalo management	
CO4- Explain the general management practices	
CO5- Explain the dairy development in India-	
CO6- Describe the composition of milk, Constituent of Milk, Factors affecting Quality and Quantity of milk, Nutritive value , and Physico-chemical properties of milk	
CO7- Describe the poultry management	
CO8- Detailed study of major animal diseases	

MODULE 1 12 Hrs

Role of Livestock in National economy: Management- Principles of management, Functions of
management, Tools of management. General Management Practices in Dairy farming- Grooming,

Drying off, Control of bad habits, Castration, Dehorning, Trimming, Shoeing, Identification marks, removing extra teats.

MODULE 2 12 Hrs

Cattle and Buffalo management- Housing of Cattle, Calf raising, Heifer management, Management of pregnant and lactating cow and Buffaloes, Care and management of cross breed cow, Care and management of breeding bull, Sheep and Goat management- Housing of sheep and goat, General management practices.

MODULE 3 12 Hrs

Milk Industry: Dairy Development in India- Operation Flood Programme, Contribution of Military Dairy Farm, NDDB, NDRI, Milk grid to dairy development. Dairy Co-operatives structure and functions, Milk Chemistry and Milk constituents- Definition of Milk, Composition of Milk, Constituent of Milk, Factors affecting Quality and Quantity of milk, Nutritive value of milk, Physico-chemical properties of milk. Clean milk production: Source of contamination.

MODULE 4 12 Hrs

Poultry management: - Housing of Poultry, General Management practices, Pig Farming, Rabbit Farming, Duck Farming- Breeds of duck, General management practices. Quail management.

MODULE 5 12 Hrs

Classification of Animal Diseases: Study of major Diseases- Foot and mouth disease (FMD) Rinderpest, Anthrax, Black quarter (BQ), Haemorrhagic Septicaemia (HS). Study of Parasitic Diseases: Brucellosis, Babesiasis, Theleriosis. Diseases of lactating cow: Mastitis, Dystokia Milk fever, Prolaps, Ketosis. Diseases of Calves: Pneumonia, Calf score, Diarrhoea. Poultry Diseases- Ranikhet, Coccidiosis, Bird flu, Parasites of poultry. First aid measures. Disposal of carcasses.

Text books:

1) A Text Book of Animal Husbandry by G.C. Banarjee
2) A Text Book of Animal Science by. Dr. A.U. Bhikane and Dr. S.B. Kawitkar
3) Advances in Dairy Animal Production by V.D. Mudgal, K.K. Singhal and D.D. Sharma
4) Handbook of animal Husbandry, The I.C.A.R. publication
5) Animal Husbandry & Dairy Science by. Jagdish Prasad.
6) Dairy India Yearbook - 2007 by. P.R. Gupta
7) Hanbook of Veterinary Physician by V.A. Sapre
8) Farm Animal management and feeding practices in India by Thomas & Shashtri
9) Dairy Microbiology by K.C. Mahanta

Course No. 4.6 Course Code: SDCAG20 (P) Course Title: Protected cultivation of crops- Practicals	Credits: 4 Total Contact Hrs: 60 Hrs
Objectives • To practice with protected cultivation practices of important crops	

Contents

Protected cultivation in general:

1. Study of structures utilized for protected culture.
2. Cost estimation of different growing structures
3. Design and orientation of poly/green houses.
4. Study of various inputs used for protected culture
5. Type of containers used in protected culture.
6. Use of substrate and preparation of substrate for protected cultivation
7. Fertigation system in green houses
8. Maintenance of cooling and heating system in green houses.
9. Special horticultural practices in protected cultivation

Protected cultivation aspects of individual crops:

1. Protected cultivation of cowpea,
2. Protected cultivation of capsicum
3. Protected cultivation of cucumber
4. Protected cultivation of tomato
5. Protected cultivation of orchids and anthurium.
6. Protected cultivation of rose.

Course No. 4.7 Course Code: SDCAG21 (P) Course Title: Weed Management and Fodder crop Production and Livestock Farming- Practicals	Credits: 4 Total Contact Hrs: 60 Hrs
Objectives • To familiarize with the general characters of weeds and their management. • To familiarize with cultivation of rice, fibre crops, fodder crops etc. • Familiarization with cultural methods of pest control. • To familiarize with practices in livestock farming. • To acquaint with the management of important farm animals and birds	

Weed management

1. Techniques of weed collection, identification and preparation of herbarium of weeds.
2. Herbicide formulation and identification- Herbicide label information.
3. Study of herbicide application equipments and calibration.
4. Computation of herbicide doses.

5. Field practice of spraying herbicides in the field.
6. Recording observations on the effect of herbicides on crops and weeds.
7. Hand weeding and hoeing using conoweeder in rice.
8. Hoeing and after cultivation in cassava plots.
9. Economics of weed control practices.
10. Visit to areas with problem weeds.
11. Familiarization and planting of various fodder crops and their preservation.
12. After cultivation operations of major crops.

Pest management

1. Familiarization with Mechanical methods of pest control.
2. Identification of predators.
3. Identification of microbial agents.
4. Familiarization with different formulations of insecticides.
5. Preparation of neem oil garlic emulsion and tobacco decoction.
6. Familiarization with different insecticides.
7. Calculation of doses/concentrations of insecticides.
8. Preparation of spray fluid for field application.
9. Familiarization with Plant protection equipments.
10. Identification, symptoms of damage, collection and preservation of pests of:

a) Rice, Coconut.
b) Banana, Cashew.
c) Pepper, cardamom.
d) Brinjal, Bittergourd and cowpea.

Live stock farming

1. Morphology of cattle, buffalo and poultry
2. Classification of Cattle Breeds
3. Study of Cattle, Breeds

a. Milch : Gir, Sahiwal, Red Sindhi,
b. Draught: Khillar, Dangi, Red kandhari.
c. Dual: Deoni, Hariyana
d. Exotic: Jearsy, H.F.
e. Cross breed: Holdeo, Jerdeo.

4. Study of Buffalo Breeds: Murrah, Jaffrabadi, Nagpuri and Surti
5. Study of Sheep and Goat breeds: Osmanabadi, Jamnapuri, Saanem

Course No. 4.8 **Course Code: SDC4AG22(P)** **Course Title: Internship/Project (Cultivation of Rice)**	**Credits: 4** **Total Contact Hrs: 60 Hrs**

Objectives

• To understand the sustainable cultivation aspects of rice under low land condition.

• Rice-crop planning

• Nursery raising: Land preparation, seed treatment, sowing, water management, nutrient management, and plant protection

• Main field preparation, transplanting, nutrient management, water management, Identification of weeds and weed management

• Identification of insect pests and diseases and plant protection

• Harvesting, postharvest handling of produce, storage and marketing of produce. Harvest Index- Preparation of balance sheet including cost: benefit ratio (A minimum 5cents will be allotted to each student).

NOTE: In addition to regular practicals, the students will complete certain time bound operations after the regular class hours.

AUDIT COURSE 4th SEMESTER

GENDER STUDIES (AUD4E04)

Objectives

1. To provide basic understanding of the importance of Gender studies
2. To introduce basic concepts relating to gender and to provide logical understanding of gender roles.
3. To provide an analytical understanding of gender differences and major gender issues
4. To conscientise the students on cultural construction of masculinity and femininity
5. To provide an analytical understanding of women empowerment and gender equality
6. To provide a critical understanding of women developmental policies and programmes.

MODULE I : Gender and Gender Studies

I.1. Origin and Development of Gender Studies, Gender Studies in National and International Settings, Objectives and Relevance of Gender Studies

I.2. Social Construction of Gender: Sex and gender, Gender Difference, Gender Inequality, Gender Bias, Gender Discrimination

I.3. Gender Socialization: Construction of Femininity and Masculinity, Equality and Difference, Gender Identity and Self Image, Gender Roles, Segregation and Ranking.

MODULE II : Gender and Economy

II.1. Gender and Economy: Economic Inequality, Productive and Unproductive work, Visible and Invisible Work, Paid and Unpaid Work

II.2. Sexual Division of Labor: Private-Public Dichotomy, organized and unorganized sector. Feminization of Work, New Economic Policy and its impact on Women.

II.3. Women and Work: Production vs. Reproduction, Household Work, Women's Work and Technology

MODULE III : Major Gender Issues

III-1. Gender and Family: Gender Role Divisions, Domestic violence: physical, sexual, psychological and verbal, Denial of reproductive rights, Female Genital Mutilation (FGM), Dowry harassment and death, Child abuse.

III-2. Gender issues: Sexual exploitation, Rape, Prostitution, Sex Tourism, Sexual Harassment, Media violence

III.3. Women and Health: Early marriage and early motherhood. Ill-health, Mortality and Morbidity, Factors influencing health, Problems of destitute and aged women

MODULE IV: Status of women and Challenges to Development

V.1. Social and Economic Status of Women: Women in third world societies with special reference to India.

V.I Political and Religious Status of Women: Cultural and Religious prominence, Political participation and Power.

V.2. Factors influencing the status of women: Illiteracy and low education, Denial of access to resources, Selective abortion and female infanticide.

MODULE V: Women Empowerment and gender equality

IV.1. Empowerment and need for empowerment: Quality of Life Perspective and Contribution of Women

IV.2. Various facets for empowerment: social, economic, educational, legal, political empowerment

IV: 3. Empowerment Programmes: Government Empowerment Schemes and hindrances in the path of Women empowerment.

MODULE VI : Women and Development policies and programmes

VI-1. Gender and Politics: Political Role and Participation of Women in India, Women's Reservation Bill, and Laws related to women's property rights and inheritance, conditions of work and pay.

VI.2. National policies and programs: Feminist standpoint of development policy, Gender analysis of development policy, engendering development policies.

VI.3. Critical review of women development programs in India-Role of non-state actors, Role of NGOs – Development initiatives, Self Help Groups, Micro finance and micro enterprises, Kudumbasree.

VI.4. Women development: International initiatives, Copenhagen conference, Nairobi Conference, Beijing Conference, Mexico City conference

SEMESTER V

Course No. 5.1 **Course Code: SDCAG23** **Course Title: Environmental Microbiology and Biotechnology**	**Credits: 4** **Total Contact Hrs: 60 Hrs**
Objectives • To understand various aspects of environmental microbiology and biotechnology	

Module-I

Introduction to Microbiology-History-scope-Types –structure, biology and classification of bacteria, mycoplasma, fungi, algae and virus-identification (10 Hours)

Module-II

Rules, regulations and tools in Microbiology- Basic principles of Autoclave, Hot air oven, laminar air flow. Microscopy-Bright field-phase contrast-dark field-fluorescent-con-focal electron
microscopy (SEM,TEM) Centrifuge-spectrophotometer (10 Hours)

ModuleIII

Sampling Techniques: Preparation of samples, types of media-sterilization techniques-cultivation
and preservation of microorganism-methods of estimation and isolation of microorganism in soil,
water and milk(10 Hours)

Module-IV

Microbiology of soil-microbial flora of soil-interaction among soil microorganism-role of soil microorganisms-nitrogen, carbon, sulphur cycles-microbiology of aquatic micro organism-Air
microbiology-distribution, techniques and role of air microorganisms.(10 Hours)

Module-V

Microbial Genetics-concept of the gene mutations, transformation, conjugation, transduction, plasmids, microbial control of environmental pollution; genetic engineering and recombinant DNA techniques.(brief study only)(10 Hours)

Module-VI

Microbial growth process-major products of Industrial microbiology-alcoholic beverages, amino
acids and antibiotics,, Recombinant DNA technique in Biotechnology-Gene cloning-cloning vectors, organic synthesis and degradation, Environmental Applications (10 Hours)

Text Books:

Microbiology-Paul.A.Ketchum.1984.John wiley and Sons,Newyork.
Microbiology-L.M.Prescott,J.P.Harley,D.A.Klein,1993.2nd Ed.Wm.C.Brown Publishers
Microbiology-M.J.Pelczar,E.C.S.Chan,N.R.Kreig.1996. Mc Graw Hill Books Co.,Newyork
Microbiology-Fundamentals and Applications. Atlas,R.M.Macmillian Pub. Co.,New York

References:

Bacterial Metabolism. Doelle,N.W.1975.2nd Ed.Academic Press
Microbial Genetics-D.Freigelder,1987.Jones BartkettPublishers,Inc,Boston
Introduction to Environmental Microbiology.Mitchell,R.1974.Prentice Hall Int.
Introduction to Soil Microbiology.M.Alexander.1977Ny. John Wiley and Sons
Aquatic Microbiology –G.Rheinheimer.1991.4th Ed. John Wiley and Sons
Microbial Biotechnology-A.N.Glazer,H.Nikadio.1995.W.H.Freeman &Co.,New York
Bacteriology- Salle
A text book of Microbiology. Ananthanarayanan,R and JayaramPanicker

Course No. 5.1 **Course Code: SDC3AG23** **Course Title: Government Policies and Programmes Related to Agriculture**	**Credits: 5** **Total Contact Hrs: 60 Hrs**
Objectives • To acquaint with various Government Policies related to Agriculture in Kerala and India. • To familiarise with five year plans and Panchayathiraj system in India.	

MODULE 1 Introduction to agricultural policies **10 Hrs**

Introduction to agricultural policies of Kerala and of India - need and importance - National
Agricultural Policy in brief.

MODULE 2 Agricultural policies regarding land and labour **20 Hrs**

Agricultural policies regarding land - need and scope for land reforms - Abolition of intermediaries - Tenancy reforms - Ceiling on land holdings - appraisal of land reforms.- Size
pattern of operational holdings, problem of sub-division and fragmentation of holdings.
Agricultural policies regarding labour - present position of agricultural labour - minimum wages- abolition of bonded labour - Recommendations of the National Commission on Rural Labour –NREGP.

MODULE 3 Agricultural policies regarding seeds and fertilizers **20 Hrs**

Agricultural policies regarding seeds - National Seeds Policy -varietal development and plant variety protection - seed production - quality assurance - seed distribution and marketing – infrastructure facilities - transgenic plant varieties - import of seeds and planting material - export of seeds - promotion of domestic seed industry Agricultural policies regarding fertilizers
- Fertilizer pricing policy - payment of subsidy. Agricultural policies regarding plant protection
chemicals - pesticide production and consumption in India - protection of consumers from

adverse impacts of pesticides. Agricultural policies regarding irrigation, machinery, technology etc.

MODULE 4 Agricultural policies regarding credit 15 Hrs

Agricultural policies regarding credit - Co-operatives and rural credit - Commercial banks and

rural credit - Regional Rural Banks - Lead Bank Scheme - NABARD. Agricultural policies of

Kerala and of India- regarding agricultural products and their marketing, export and prices – food security.

MODULE 5 Five Year plans and Panchayathiraj 15 Hrs

Concept of planned growth- Five Year Plans-Government policies and programs in agriculture

and rural development. IADP - IAAP- IWDP- Watershed development Programmes- IRDPNREGP-SGSY - Kudumbasree- etc. Peoples' Plan- Decentralised planning- current Plans -Agricultural development programmes and schemes of the dept. of Agriculture- liaison with

Local Self Government. Panchayati raj system and institutions- gramasabha- Preparation of plan projects in agriculture.

Text books:

1. Government of India. Five year Plan Documents.

2. Government of India.Economic Survey. Published by Planning Commission (various issues)

3. Government of India.Economic Review. Published by State Planning Board (various issues)

Course No. 5.2 **Course Code: SDCAG24** **Course Title: Food and Dairy Microbiology**	**Credits: 4** **Total Contact Hrs: 60 Hrs**
Objectives • To understand various aspects of food and dairy microbiology	

Module 1 (10 hours)

Food as a substrate for microorganisms. Types of microorganisms in food - Source of contamination - Factors influencing microbial growth in foods (extrinsic and intrinsic) Microbial

examination of food- viable colony count, examination of fecal Streptococci.

Module 2 (10 hours)

Physical and chemical properties of milk. Milk as a substrate for microorganisms. Types of microorganisms in Milk- bacteria, fungi and yeast. Sources of microbial contamination of milk.

Microbiological analysis of milk. Rapid platform testsorganoleptic, Clot on boiling (COB), turntable acidity alcohol test, DMC, sedimentation test and pH. Standard plate count, MBRT.

Module 3 (10 hours)

Food fermentations: Cheese, bread, yoghurt, idli, fermented pickles and fermented vegetables,
Ice cream, - methods and organisms used. SCP, Probiotics and prebiotics.

Module 4 **(10 hours)**

General principles underlying spoilage, different kinds of foods, cereals and cereal products -
sugar and sugar products - vegetable and fruits - meat and meat products - fish and other sea foods - eggs and poultry - dairy and fermentative products (ice cream/milk/bread/wine).

Module 5 **(10 hours)**

Food Poisoning : food borne infections (a) Bacterial: Staphylococcal, Brucella, Bacillus, Clostridium, Escherichia, Salmonella (b) Fungal : Mycotoxins including aflatoxins, ergotism (c)Viral: Hepatitis, (d) Protozoa - Amoebiasis.

Module 6 **(10 hours)**

Food preservation : Principles of food preservation - methods of preservation. a. Physical (irradiation, drying, heat processing, pasteurization, chilling and freezing, high pressure and modification of atmosphere) b. Chemical (Sodium benzoate Class I & II). Food Sanitation: Good manufacturing practices - HACCP, Presonnel hygiene.

Suggested Readings

1. Food Microbiology by Adams, M R . and Moss, M.O.1995.The Royal Society of Chemistry, Cambridge.
2. Food Microbiology by Frazier, W.C. and Westhoff, D.C.1988.TATA McGraw HillPublishing company
ltd., New Delhi.
3. Modern Food Microbiology by Jay, J.M.1987.CBS Publishers and distributors, New Delhi.
4. Basic Food Microbiology by Banwart, G.J.1989.Chapman & Hall New York.
5. A Modern Introduction to Food Microbiology by Board, R.C.1983.Blackwell Scientific Publications,
Oxford.
6. Dairy Microbiology by Robinson, R.K.1990. Elsevier Applied Science, London.
7. Food Poisoning and Food Hygiene, Hobbs, B.C. and Roberts, D.1993. Edward Arnold.
8. MICROBIOLOGICAL EXAMINATION METHODS OF FOOD AND WATER by SILVA
9. Lund BM, Baird Parker AC, and Gould GW. (2000). *The Microbiological Safety and Quality of Foods.*
Vol. 1-2, ASPEN Publication, Gaithersberg, MD.
10. Gould GW. (1995). *New Methods of Food Preservation.* Blackie Academic and Professional, London.

Course No. 5.2 Course Code: SDCAG24 Course Title: Landscaping and Gardening	Credits: 4 Total Contact Hrs: 60 Hrs
Objectives • To familiarize with landscaping, gardening and commercial Floriculture	

Module 1

Introduction to landscaping, gardening and commercial Floriculture. Components of landscapes and gardens, descriptions and functional uses – Living components – Non living components – Enrichment item. Garden enclosures, surfacing materials, roads and paths, enrichment items

Module 2

Types of gardens – Styles in gardening – characteristics and components of gardens. Principles of landscaping. Designing and Preparation of landscape and garden plans.
Functional uses of plants for different purposes. Components of gardens.

Module 3

Lawn Types of lawn grasses, methods of establishing, maintenance and rejuvenation of lawns. Annuals and herbaceous perennials Function and selection colour schemes, planting designs, Cultural practices

Module 4

Specialized gardening techniques. Indoor gardening of plants Bonsai, vertical garden, tray garden, terrarium *etc*. Flower arrangement, flower shows and judging flower shows and arrangement, styles and designs

Suggested Readings

1. Bose,T.K. and Mukherjee, D. 1972. *Gardening in India*. Oxford and IBH Publishing Company, Calcutta.
2. Bose, T.K., Maiti, R.G., Dhuna, R.S. and Das., P. (eds) 1909. *Floriculture and Landscaping*.
Naya Prakash, Calcutta, India.
3. Bhattacharjee,S.K.(ed). 2006. *Advances in Ornamental Horticulture* Vol. I to VI. Pointer Publishers, Jaipur.
4. Chadha, K.L. and Choudhury, B. 1992. *Ornamental Horticulture in India*., ICAR, New Delhi.
5. Gilbert, R. 1988. *200 House plants any one can grow*. Dorling Kindersley Ltd., London. 144p.
6. Jindal, S.L. 1987. *Flowering shrubs in India.* Publications Division, Govt. of India, New Delhi. 175p.
7. Joiner.J.N. 1981. *Foliage Plant Production*. Prentice Hall Inc., London.
8. KAU(Kerala Agricultural University) 2011. Package of Practices Recommendations: Crops(14th Ed). Kerala Agricultural University, Thrissur. 360p.

9. Pal, B.P. 1972. *The rose in India*. Indian Council of Agricultural Research, New Delhi. 73
10. Randhawa, M.S. 1983. *Flowering Trees*. National Book Trust, India, New Delhi. 208p.
11. Randhawa.G.S. and Mukhopadhyay. A. 1986. *Floriculture in India*. Allied Publishers, New
Delhi. 656p.
12. Rajeevan, P.K., Singh, K.P. and Valsalakumari, P.K .2003. ed. *Bulbous Flowers*. Indian
Society of Ornamental Horticulture Division of Floriculture & Landscaping, IARI, New Delhi.
13. Sabina, G.T. 2009. *Ornamental plants*. New India Publishing Agency- 324p.
14. Santapau, H. and Heary, A.N. 1984. *A Dictionary of flowering plants in India*. CSIR, New
Delhi. 198p.
15. Sheela, V.L. 2008. *Flowers for trade*. New India Publishing Agency, New Delhi.379p.
16. Sidhu, S.S. 2016.*Ornamental Horticulture*. New India Publishing Agency,New Delhi. 485p.
17. Swarup.V. 1993. *Indoor Gardening*, ICAR, New Delhi.

Course No. 5.3 **Course Code: SDCAG25** **Course Title: Commercial Vegetable Production**	**Credits: 4** **Total Contact Hrs: 60 Hrs**
Objectives • To understand various principles and practices of commercial vegetable production.	

Module 1 **12 Hrs**

Introduction - Importance and scope of vegetable crops of India with special emphasis to Kerala.

Nutritional importance- nutrient value of vegetables, ANV. Classification of vegetables - types
of classification and their bases - Botanical, cultural, thermo classification, classification based
on parts used.

Module 2 **12 Hrs**

Factors affecting vegetable production- soil, temperature, light, water, nutrients. Basic principles
of vegetable production. Nursery, sowing and transplanting, Care and management.

Module 3 **12 Hrs**

Types of vegetable farming - Kitchen garden; Market garden; Truck garden; vegetable forcing;

Vegetable garden for seed production; Hydroponics, aeroponics, Riverbed system, Terrace

Garden
etc. Kitchen garden- site selection, principles of layout, cropping schedule. Growth regulators -role of
growth regulators in vegetable production and methods of application.

Module 4 **12 Hrs**

Production technology of warm season vegetable- Importance, origin, taxonomy, varieties, cultivation, problems and prospects for Solanaceous crops- tomato, brinjal and chilli- Cucurbitsbitter
gourd, snake gourd, cucumber, melons, pumpkins,watermelon and ivy gourd. Leguminous crops- vegetable cow pea and winged bean. Other vegetables-okra, amaranthus.

Module 5 **12 Hrs**

Production Technology of cool season vegetables- Importance, origin, taxonomy, Varieties, cultivation, problems and prospects of potato, cole crops - cabbage &cauliflower.Rootcropscarrot,
radish, beetroot.Bulb crops- onion, garlic and Leafy vegetables

Course No. 5.4 **Course Code: SDCAG26** **Course Title: Agricultural Enterprises**	**Credits: 4** **Total Contact Hrs: 60 Hrs**
Objectives • To understand various commercial enterprises in agricultural sector through observation, field visits and presentation.	

MODULE 1 **12Hrs**

Bee keeping -history and development. Honey bees- kinds of bees, biology-Hiving and domestication. Seasonal management of bees.Bee pasturage. Bee products- extraction, uses,
composition and preservation. Diseases and enemies of honey bees and their control. Bee poisoning. Scope of apiculture in Kerala. Recent advances in apiculture research.

MODULE 2 **10 Hrs**

Sericulture - history and development. Types of silkworms in India - morphology, biology, rearing of silkworms.Host plants and their cultivation.Diseases and enemies of silkworm and
their control. Use of biotechnology in sericulture.Scope of sericulture in Kerala. Recent advances in sericulture research.

MODULE 3 **23 Hrs**

Mushroom cultivation, Importance of mushroom cultivation - definition of mushroom - its importance - present scenario of mushroom cultivation - general morphological features, taxonomy and identification of different mushrooms-poisonous, hallucinogenic and

medicinal
Mushrooms. Pure culture of mushrooms and their nutritional requirements. Definition of spawn, substrate for spawn, types of spawn, methods of spawn production, characteristic of a good spawn, storage of spawn. Cultivation of Agaricus species - composting - its formulation, casing, preparation of casing mixture, sterilization, cultivation of pleurotus, Volvariella, Lentinus,
Calocybe and Auricularia. Different types of substrates, substrate preparation and sterilization,
Spawning, methods of spawning, spawn run phase, cropping. Identification and management of different pests and diseases of mushrooms. Methods of harvesting mushrooms, post harvest
treatments and preservation of mushrooms. Packing and processing - Different methods of processing, canning and dehydration. Nutritive value of mushrooms and preparation of differentrecipes.

MODULE 4 **15 Hrs**

Commercial floriculture, Status and prospects of commercial cultivation of flowers. Cultivation aspects of traditional and cut flowers - jasmine, crossandra, marigold, tuberose, gladiolous, heliconia etc. Protected cultivation of rose, gerbera, chrysanthemum etc. - general concepts and practices. Commercial cultivation of **orchid's** and anthurium. Status and prospects of Kerala. Classification and varieties, planting material production, methods of planting, media components and management, shade regulation, irrigation, nutrition, plant protection, stage and method of harvest, postharvest handling and marketing. Economics of cultivation.

Text books:

1. David, B. V. and Kumarawami, T. 1978. *Elements of Economic Entomology* Popular Book Depot, Madras.
2. Ganga, G. and Sulochanachetty. 1999. *An Introduction to Sericulture* Second edition. IBM
and Oxford Publishing Company, New Delhi.
3. Groul, R.A. 1963.*The Hive and the Honeybee.*Dadani and Sons.Inc. Illinois.
4. Krishnaswami, S., Narasimhanna, Suryanarayana and Kumararaj. 1991. *FAO Manuals on*
Mulberry Cultivation, silkworm rearing and silk reeling. IBM and Oxford Publishing Company, New Delhi.
5. Mishra, R. C. 1998.*Perspectives in Indian Apiculture*. Agro botanica, Bikaneer, Rajasthan
6. Sardar Singh. 1962. *Bee Keeping in India*. ICAR, New Delhi.
7. Chang, S. T. Miles, P. G. and Hays, W. A. 1978.*The Biology and Cultivation of Edible Mushrooms.* Academic Press, London.
8. Lulu Das. 2002. *Mushroom Recipes*. (Released in the VIII Biennial meeting of AICMIP).
9. Nair, M. C. 1995.*Beneficial Fungi and TheirUtilization.*Scientific publishers, New PaliRoad,
Jodhpur.

10. Randhawa, G.S. and Mukhopadhyay, A. 1986.*Floriculture in India*. Allied publishers New Delhi.
11. Rogers, J. 1974.*Flower arranging*. Hamlyn, London

Course No. 5.5 **Course Code: SDC3AG27** **Course Title: Fundamentals of Organic Farming**	**Credits: 4** **Total Contact Hrs: 60 Hrs**
Objectives • To familiarize with the concept of sustainability and sustainable development. • To acquaint with the fundamentals of organic farming. • To have the knowledge about the organic certification procedures.	

MODULE 1 **12 Hrs**

The concept of sustainability and sustainable development-emerging issues- Sustainable agriculture- concept themes- differences between conventional, sustainable, and alternate agriculture- Various alternate agricultural systems- Conventional, sustainable, and alternate agriculture- Alternate agricultural systems- biodynamic farming, natural farming, organic farming, permaculture, homa farming, and other formslimitations- Modernization of agriculture and its relation to sustainability.

MODULE 2 **12Hrs**

Factors affecting ecological balance and ameliorative measures- Indian agriculture in terms of
availability of natural resources and their carrying capacity- Strategies for realizing sustainable
agriculture- low vs. high external input agriculture -Natural resource management as a part of
sustainable resource management -crop production practices- animal productionpractices- Basic ecological principles of LEISA - promising LEISA techniques and practices –Good Agricultural Practices(GAP)- GAP certification -Improved manure handling - crop residue management - strategic use of chemical fertilizers and pesticides, traps, repellants and biological control, water conservation measures for sustainability- water harvesting - ITK and farmer centered techniques and practices.

MODULE 3 **12 Hrs**

Organic agriculture-history-concepts- philosophy- objectives, opportunities and priorities- Criticisms- Organic farming and food security-Principles of organic farming. Tools and practices of organic farming: Planned crop rotation, Green manures and cover crops, Manuring and composting, multiple cropping.Intercropping in relation to maintenance of soil productivity.

MODULE 4 **12 Hrs**

Biological pest control: Biological agents -Mass multiplication and familiarization with field

application, Different traps and pheromones for pest control. Biocontrol of weeds, diseases and
insect pests, Sanitation, Tillage and cultivation, Mulching, Supplemental fertilization, Biorationalpesticides, Foliar fertilization.

MODULE 5 **12 Hrs**

Socio-economic impacts; Marketing and export potential - Current status of organic farming -
Initiatives in India and Kerala- National Programme for Organic Production (NPOP) - Operational structure of NPOP-Accreditation agencies- Certification Agencies - National Standards for Organic Products (NSOP)-inspection and certification procedures.

Text books:

1. Ananthakrishnan, T.N. (ed.) 1992. Emerging Trends in Biological Control of Phytophagous insects.Oxford& IBH, New Delhi.
2. Chhonkar, P.K. and Dwivedi, B.S. 2004. Organic farming and its implications on India's food security.Fertil. News 49(11): 15-18,21-28,31&38.
3. Gaur, A.C. 1982. A Manual of Rural Composting. FAO/UNDP Regional Project Document,
FAO, Rome.
4. Howard, A. 1940. An Agricultural Testament. Oxford University, London. Lampin, N. 1990. Organic Farming. Farming Press Books, Ipswitch, U.K.
5. Palaniappan, S.P and Anandurai, K. 1999. Organic Farming- Theory and Practice, Scientific
Pub., Jodhpur.
6. Reddy, M.V. (ed.) 1995.Soil organism and Litter decomposition in the Tropics. Oxford &IBH, New Delhi.
7. Singh, S.P. (ed.) 1994. Technology for Production of Natural Enemies, Project Directorate
of Biological Control, Bangalore.
8. Trewavas, A. 2004. A critical assessment of organic farming and food assertions with
9. Trivedi, R.N. 1993. A Text Book of Environmental Sciences, Anmol Pub., New Delhi.
10. Veeresh, G.K., Shivashankar, K. and Singlachar, M.A. 1997. Organic Farming and Sustainable Agriculture, Association for Promotion of Organic Farming, Bangalore.
11. Woomer, PL. and Swift, M.J. 1994. The Biological Management of Tropical Soil Fertility,.S.B.F. & Wiley.

Course No. 5.7 **Course Code: SDC3AG28** **Course Title: Commercial Vegetable Production- Practicals**	**Credits: 5** **Total Contact Hrs: 75 hrs**

Objectives

• To develop skill in cultivation of vegetable crops

Commercial vegetable production

1. Main field preparation and planting of transplanted tropical vegetable crops.
2. Main field preparation and planting of direct sown vegetable crops.
3. Preparation of nursery bed, sowing and aftercare of seeds of vegetable crops.
4. Preparation of growth regulator solutions and application.
5. Maturity indices and harvesting of vegetables for vegetable purpose and seed purpose.
6. Identification and familiarization of cool season vegetables.
7. Main field preparation and planting of cool season vegetables.
8. Visit to the farmer's fields in the vegetable growing areas to study the field problems faced by the farmer

Course No. 5.7 **Course Code: SDC3AG29** **Course Title: Agricultural Enterprises -Practicals**	**Credits: 5** **Total Contact Hrs: 75**
Objectives To develop awareness on bee keeping, sericulture and lac culture through observation, field visit and reporting. To develop skill in cultivation of edible mushrooms and to develop skill in dry flower production and bouquet making. To familiarize with the production and utilization of biofertilizers and biocontrol agents.	

Agricultural Enterprises

1. Different types of bees and bee equipments
2. Handling of bee colonies.
3. Extraction and processing of honey.
4. Visit to apiaries
5. Identification of silkworms
6. Laboratory rearing of mulberry silkworms and visit to rearing units.
7. Identification of lac insects and their natural enemies.
8. Identification of common edible and poisonous mushrooms.
9. Preparation of substrates for mushroom cultivation.
10. Oyster mushroom cultivation.
11. Paddy straw mushroom cultivation.
12. Button mushroom cultivation.
13. Visit to a commercial mushroom production unit.

14. Methods of harvesting mushrooms.
15. Mushroom recipes – preparation.
16. Production techniques of dry flowers.
17. Value addition in cut flowers and loose flowers, hands on training in preparation of garlands, bouquet, flower arrangements etc.

Course No. 5.7 **Course Code: SDC3AG30** **Course Title: Organic Farming Practical**	**Credits: 5** **Total Contact Hrs: 75**
Objectives To familiarize with organic production of various crops To gain skill with different composting techniques	

Organic farming

1. Preparation of enriched farm yard manure.
2. Coir pith composting.
3. Preparation of Vermicompost.
4. Study and field application of biofertilizers.
5. Raising green manure crops and cover crops.
6. Plant protection through bio-agents and traps.
7. Plant protection using pheromones.
8. Visit to urban waste recycling unit.
9. Study of profitable utilization of agricultural wastes.
10. Visit to poultry and dairy units to study resource allocation, utilization and economics.
11. Visit to an organic farm to study various components and utilization.

SEMESTER VI

Course No. 6.1
Course Code: SDC6AG22
Course Title: Major Internship/Main Project/Dissertation
Credits: 30

Details of Project Work

Industrial training will be conducted at the industrial premises engaged in agriculture and allied activities. A group of students (5-6 number) will be allotted to each industry. The interest of the students will be one of the major criteria in selecting the category of industry. A project report of the industrial training shall be submitted at the end of sixth semester and a viva-voce will be conducted by a panel of three subject experts.

Appendix C – Model Question Papers

Model Question Paper I

Agriculture Enterprises **Time: 2 hrs** **Max. marks: 60**

Section A

Short Answer Type Carries 2 marks each - 12 questions (Ceiling 20) (12x2 = 24)

1. What is bee space
2. Enlist the name of domesticated honeybees
3. What is Apiary
4. What is sericulture
5. Name any four edible mushrooms with scientific name
6. Write briefly about eri silkworm
7. Which all are the commercial varieties of silk cultivated in India?
8. What is a bale
9. Define brushing
10. What are the methods of communication in honey bee?
11. Name two examples each for loose flower and cut flower
12. Briefly explain the diseases and pests of mushroom

Section B

Paragraph Type Carries 5 marks each - 7 questions (Ceiling 30) (7x5 =35)

13. Explain production technology of orchid
14. Explain spawn production
15. What are the value added products of mushroom

16. Differentiate between cut flowers and loose flowers
17. Explain coccon harvesting and processing of silkworm
18. Explain the scope of commercial floriculture
19. Explain the seasonal management practices of honeybee

Section C

Essay Type Carries 10 marks each - Answer any ONE question (1 x 10 = 10)

20. Explain Diseases and enemies of silkworm and it's management
21. Explain Diseases and enemies of honeybee with their management

Model Question Paper II

Plant Tissue Culture and Biotechnology **Time: 3 hrs**

Max. marks: 80

Section A

One Word Answer Type Carries 1 mark each - 10 questions (10x1 = 10)

1. Energy source in a medium
2. Naturally occurring cytokinins

3. Example of a vector

4. Father of Tissue Culture

5. Bacteria used in transformation
6. Gelling agent used in medium

7. Normal pH range of nutrient medium suitable for *in vitro* growth of explant

8. Equipment used for sterilization of medium
9. Expand PCR
10. Enzyme used in PCR reactions

Section B

Short Answer Type Carries 2 marks each - 8 questions (8x2 =16)

11. Growth Curve

12. Embryo rescue
13. Multiple cloning site
14. Marine Biotechnology

15. Characteristics of plant tissue culture medium

16. Expression Vectors

17. Stages of Micropropagation

18. Protocol for seed culture
19. Sterilization techniques

20. Steps involved in Genetic Engineering

Section C

Short Essay Type Carries 4 marks each - Answer any six question (4 X 6 = 24)

21. Somatic hybridization

22. Cell suspension Culture

23. pBR 322 Vector

24. Gene Library *vs* Gene Bank

25.Applications of Biotechnology in medicine with examples

26. Plant Growth regulators

27. Lambda Phage Vector

28. Organogenesis and Embryogenesis

Section D

Essay Type Carries 15 marks each - Answer any two question (2 X 15 = 30)

29. Write an essay on compositions of plant tissue culture medium

30. Gene Transfer method in plants

31. Briefly Explain
    a. Protoplast culture
    b. Anther culture
    c. Endosperm culture
    d. Shoot tip Culture
    e. Callus Culture

Pazhassiraja College,Pulpally,Wayanad
NAAC re-accredited by A+ grade.
Department of Biochemistry
biochemistryt@prc.ac.in

Report on Bridge Course Conducted by the Department of Biochemistry for UG and PG Students

Introduction

The Department of Biochemistry organized a bridge course for undergraduate (UG) and postgraduate (PG) students from June 1 to June 15, 2024. This course aimed to bridge the knowledge gap between different academic levels, ensuring that students are well-prepared for the upcoming academic year. The course covered fundamental concepts, advanced topics, and practical skills essential for biochemistry studies.

Objectives

The primary objectives of the bridge course were:

To reinforce foundational concepts in biochemistry for new UG students.

To introduce advanced topics to PG students to prepare them for specialized coursework and research.

To develop practical laboratory skills and techniques.

To foster a collaborative learning environment among UG and PG students.

Course Structure

The bridge course was structured into three main components:

Theoretical Sessions: Lectures covering fundamental and advanced topics in biochemistry.

Practical Sessions: Hands-on laboratory experiments to develop essential biochemical techniques.

Interactive Workshops: Group discussions, problem-solving sessions, and case studies.

Dept. of Biochemistry
Pazhassiraja College
Pulpally-Wayanad

Topics Covered

For Undergraduate Students

Fundamental Biochemistry: Structure and function of biomolecules, metabolic pathways, enzyme kinetics.

Cell Biology: Cell structure, membrane transport, and signal transduction.

Molecular Biology: DNA replication, transcription, translation, and gene regulation.

BRIDGE COURSE

BSC BIOCHEMISTRY

SYLLABUS

Bridge courses for B.Sc. Biochemistry are designed to help students who need to strengthen their foundational knowledge in specific areas before delving into more advanced coursework in biochemistry. These courses typically cover essential concepts in chemistry, biology, and mathematics that are crucial for success in biochemistry.

Here is a general outline of the topics usually covered in bridge courses for B.Sc. Biochemistry:

1. Unit 1

-Atomic StructureElements, atomic number, mass number, isotopes, electronic configuration.

-Chemical Bonding:ionic, covalent, and metallic bonds, molecular geometry, polarity.

- Stoichiometry :Chemical equations, balancing equations, mole concept, molarity.

- Thermochemistry: Enthalpy, entropy, free energy, endothermic and exothermic reactions.

- Chemical Kinetics: Rate of reaction, factors affecting rate, activation energy.

- Chemical Equilibrium:Dynamic equilibrium, Le Chatelier's principle, equilibrium constants.

Unit2

- Introduction to Organic Compounds: Functional groups, hydrocarbons, isomerism.

- Nomenclature: IUPAC naming of organic compounds.

- Reaction Mechanisms: Addition, substitution, elimination reactions.

- Stereochemistry: Chirality, optical isomerism, conformations.

- Spectroscopy: Infrared (IR), Nuclear Magnetic Resonance (NMR), Mass Spectrometry.

Unit3

- Cell Biology: Cell structure and function, organelles, cell cycle, mitosis, meiosis.

- Genetics: Mendelian genetics, DNA structure and function, gene expression.

- Molecular Biology: DNA replication, transcription, translation.

- Microbiology: Classification of microorganisms, microbial metabolism, growth.

- Biological Molecules: Carbohydrates, proteins, lipids, nucleic acids, enzymes.

Unit4

- Basic Algebra: Functions, equations, inequalities.

- Calculus: Limits, derivatives, integration, applications to biological systems.

- Statistics: Descriptive statistics, probability, distributions, hypothesis testing.

- Graphing and Data Analysis: Interpretation of graphs, linear and nonlinear relationships.

Bridge course -Student enrolment list

B.Sc Biochemistry

Sl Number	Name	Signature
1	Janki K Nair	
2	Safla Nasreen	
3	Hyfa Nourin	
4	Risanathu	

DEPARTMENT OF COMMERCE
PAZHASSIRAJA COLLEGE
PULPALLY

BRIDGE COURSE 2023-24 AT
FOR FIRST YEARS(2023-26 BATCH)

01/08/2023 TO
04/08/2023

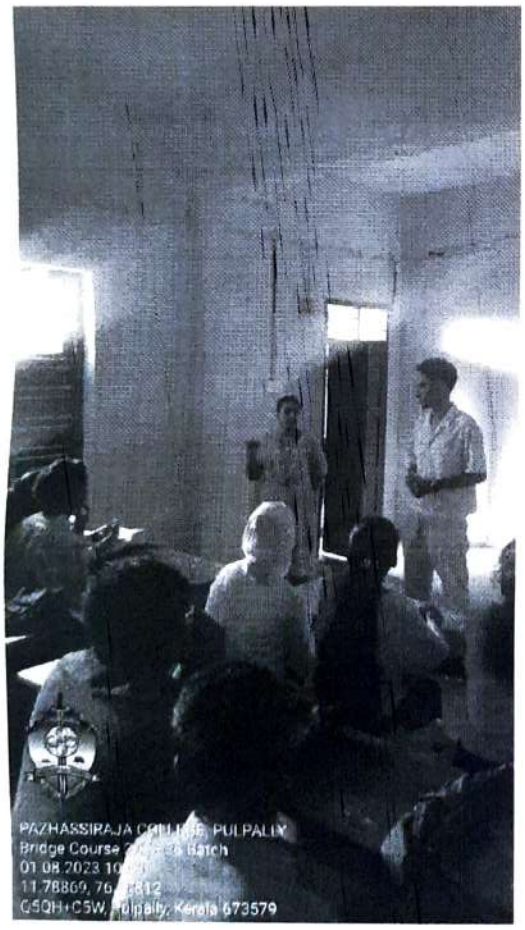
SESSIONS HANDLED BY

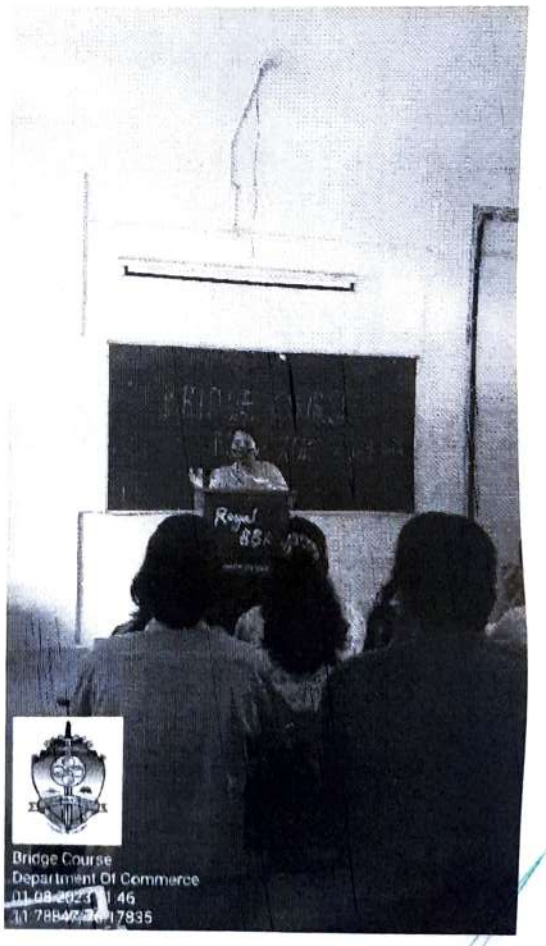
MRS.VIMYA KP
MR.KOSHY C.J
MR.SWARUN SEBASTIAN
MRS.RENJU THOMAS

PRINCIPAL
PAZHASSIRAJA COLLEGE
PULPALLY - 673579

Report of Bridge Course 2023-24 AY

- Conducted 4 days Bridge course for the first year students with a view to bridging their academic gap from plus two to graduation studies. In all the 4 days 4 hours were taken and it was totally a 16 hour programme for the students.
- Hours handled by
    - VIMYA K P
    - KOSHY CJ
    - SWARUN SEBASTIAN
    - RENJU THOMAS






Bridge Course
Department Of Commerce
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SYLLABUS-BRIDGE COURSE

I. Principles and **Functions of Management**

Unit 1: Nature and Significance of Management

Concept:

- Management – concept, objectives, and importance
- Management as Science, Art and Profession
- Levels of Management
- Management functions-planning, organising, staffing, directing and controlling
- Coordination- concept and importance

Unit 2: Principles of Management

- Principles of Management- concept and significance
- Fayol's principles of management
- Taylor's Scientific management- principles and techniques

Unit 3: Business Environment

- Business Environment- concept and importance
- Dimensions of Business Environment, Economic, Social, Technological, Political and Legal
- Demonetization – concept and features

II. Accounting for Partnership Firms and Companies

Unit 1: Accounting for Partnership Firms

- Partnership: features, Partnership Deed.
- Provisions of the Indian Partnership Act 1932 in the absence of partnership deed.
- Fixed v/s fluctuating capital accounts. Preparation of Profit and Loss Appropriation account- division of profit among partners, guarantee of profits.
- Past adjustments (relating to interest on capital, interest on drawing, salary and profit sharing ratio).
- Goodwill: meaning, nature, factors affecting and methods of valuation – average profit, super profit and capitalization.

Note: Interest on partner's loan is to be treated as a charge against profits.
Goodwill: meaning, factors affecting, need for valuation, methods for calculation (average profits, super profits and capitalization), adjusted through partners' capital/ current account or by raising and writing off goodwill (AS 26)

Unit 2: Accounting for Partnership firms – Reconstitution and Dissolution.

- **Change in the Profit-Sharing Ratio** among the existing partners – sacrificing ratio, gaining ratio, accounting for revaluation of assets and reassessment of liabilities and treatment of reserves, accumulated profits and losses. Preparation of revaluation account and balance sheet.
- **Admission of a partner-** effect of admission of a partner on change in the profit sharing ratio.

Unit-3 Accounting for Companies

Accounting for Share Capital

- Features and types of companies
- Share and share capital: nature and types.
- Accounting for share capital: issue and allotment of equity and preferences shares.
  Public subscription of shares – over subscription and under subscription of shares; issued at par and at premium, calls in advance and arrears (excluding interest), issue of shares for consideration other than cash.
- Concept of Private Placement and Employee Stock Option Plan (ESOP), Sweat Equity.
- Accounting treatment of forfeiture and reissue of shares.
- Disclosure of share capital in the Balance Sheet of a company.

III. General Overview about course and department

- History of the department
- General academic instructions

Attendence Sheet –Bridge Course 2023-2024

SL NO	NAME OF THE STUDENT	SIGNATURE OF THE STUDENT
1	Naja Jawhath	
2	Navya Vasan RV	
3	Anagha manoj	
4	Shyamily · P	
5	Sreejisha T K	
6.	Mereena Johny	
7	Fidha Farhana · K	
8	Gladwin Reji	
9	Sadiya	
10	Abhijith V.J	
11	Abhijith N.V	
12	Abinav P.V	
13	HASNA PARVIN	
14	RINSILA · P	
15	Thanha Thabassu	
16	Fida maryam	
17	Abhinav Soman	
18	Abhilash krisha PS	
19	Adithyan · K.K	
20	Abel James	
21	Anitta p Joseph	
22	Anjana · K · S	
23	Anju MI	
24	Sreya · SR	
25	Aswin Krishna T G	
26	Arjun Kovath	
27	Amrutha v.v	
28	Alin K Philip	
29	Binny Vaghese	
30	Hadhi Nihal	
31	Syam Krishnan · PP	
32	Sebin C jojo	
33	Manjeeth Kumar P.A	

DEPARTMENT OF ECONOMICS

PAZHASSIRAJA COLLEGE PULPALLY
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Reaccredited by NAAC with A+ Grade
✉ economics@prc.ac.in

Pulpally

07/08/2023

To

The Principal

Pazhassiraja College, Pulpally

Sir,

Reg: Conduct of Bridge Course for First Year Students

Department of Economics, Pazhassiraja College, Pulpally is planning to conduct a Bridge Course for the first year students from 16/08/2023 to 18/08/23. Kindly permit to conduct the programme.

Dr. Silvi T S

The Head
Department of Economics
Pazhassiraja College
Pulpally, Pin 673579

PRINCIPAL IN- CHARGE
PAZHASSIRAJA COLLEGE
PULPALLY - 673579

DEPARTMENT OF ECONOMICS
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Reaccredited by NAAC with A+ Grade
economics@prc.ac.in

BRIDGE COURSE 2023-24

Introduction

The Economics Department organized a three-day bridge course for first-year BA Economics and BA Econometrics students from August 16 to August 18, 2023. The course aimed to provide a foundational understanding of key economic concepts and mathematical tools, ensuring a smooth transition into the rigorous academic environment of the undergraduate programs.

Objectives

The primary objectives of the bridge course were:

- To introduce students to the basic principles of economics.
- To differentiate between microeconomics and macroeconomics.
- To familiarize students with essential microeconomic and macroeconomic concepts.
- To equip students with fundamental mathematical skills necessary for economic analysis.

Teaching Methods

The bridge course employed a mix of lectures, interactive discussions, and practical exercises to engage students and enhance their learning experience. Each session was conducted by an experienced faculty member, ensuring high-quality instruction and guidance.

Syllabus

Module 1

What is Economics? – Scope of Economics – Microeconomics and Macroeconomics-

Module 2

Microeconomics concepts: Demand, Supply, Market Equilibrium, Elasticity-Types of Markets.

Macroeconomic concepts: Types of Variables- National Income, GDP, GNP, PCI, Monetary policy.

Module 3

Types of data, Classification, Measures of central tendency, Basic mathematical calculations.Differential calculus, probability, Distributions.

Schedule

DATE	DAY	FACULTY
16-08-2023	Wednesday	Dr Silvi T S
17-08-2023	Thursday	Dr Merin S Thadathil
18-08-2023	Friday	Mr. Amal Marcus

Outcomes

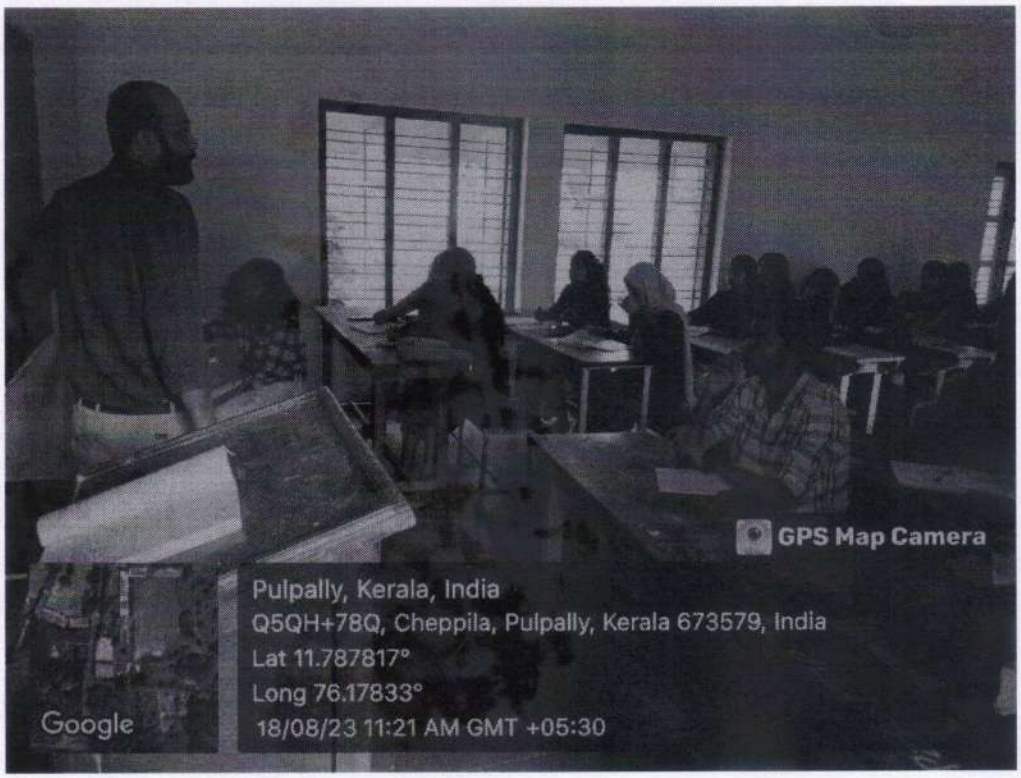
The bridge course successfully achieved its objectives, as evidenced by the positive feedback from 40 students. Key outcomes included:

Enhanced Understanding: Students gained a clear understanding of fundamental economic principles and were able to distinguish between microeconomic and macroeconomic concepts.

Practical Application: Through interactive discussions and case studies, students learned to apply theoretical concepts to practical situations.

Statistical and Mathematical Proficiency: The hands-on exercises helped students build confidence in using basic statistical methods and mathematical tools, which are crucial for economic analysis.

Engagement and Interaction: The course fostered a collaborative learning environment, encouraging students to engage with their peers and faculty members.



Conclusion

The bridge course for first-year BA Economics and BA Econometrics students was a well-structured and effective program that laid a strong foundation for their academic journey. The combination of lectures, discussions, and practical exercises ensured a comprehensive understanding of essential concepts, preparing students for the challenges of their undergraduate studies in economics and econometrics.

The Head
Department of Economics
Pazhassiraja College
Pulpally, Pin 673579

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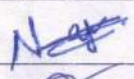
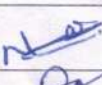
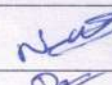
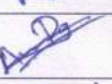
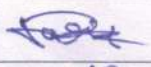
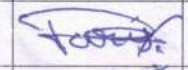
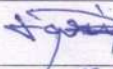
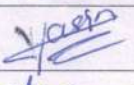
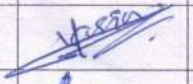
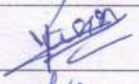
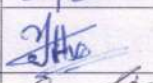
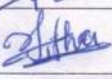
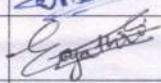
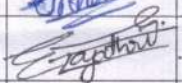
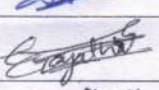
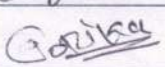
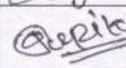
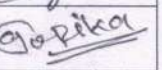
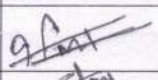
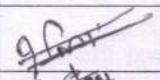
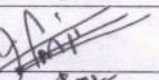
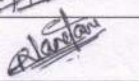
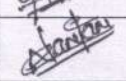
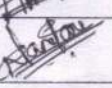
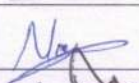
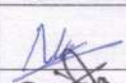
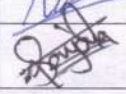
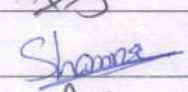
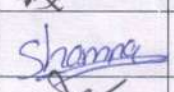
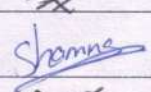
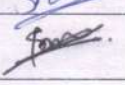
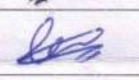
PULPALLY - 673579

Department of Economics
Bridge Course 2023-24

Attendance Sheet

Sl. No	Name of the Student	16/8/23	17/8/23	18/8/23
BA Economics				
1	Abitha A N			
2	Adithya P			
3	Amal Jhonson			
4	Anusree K P			
5	Arun Tampi			
6	AshinBiju			
7	Ashitha T S			
8	Ashmila Thesni			
9	Athila Sherin			
10	Devananda M P			
11	Fathimathul Farseena			
12	Fida Jasmin K T			
13	Fidha Mariyam			
14	Jasna K			
15	Parvana J S			
16	Rethu			
17	Rishinlal N K			
18	Sharban			
19	Samji Jose			
BA Econometrics				
20	Adhya P S			
21	Aryanandha v S			
22	Devi Krishna R P			

23	Najiya N			
24	Anuraj K			
25	Faris Rahman M T			
26	Muhammed Yasin P P			
27	Fitha Nasrin C			
28	Gayathri M			
29	Gopika Babu			
30	Hashmi S Subhash			
31	Nandana Balan P			
32	Noufiya Najeeb			
33	Sanjana P P			
34	Shamna Sherin K S			
35	Sreelakshmi V P			
36	Adarsh K V			
37	Athul Suresh			
38	Harinandh N P			
39	Sachu Vijayan			
40	Sarang T P			

The Head
Department of Economics
Pazhassiraja College
Pulpally, Pin 673579

Bridge Course 2023- 2024

Course Duration: August 21, 2023 – August 24, 2023

Objectives: The primary aim of the bridge course was to familiarize first-year BA English Language and Literature students with various genres of English literature. The course sought to bridge the gap between high school English curriculum and the more advanced and diverse literary studies at the undergraduate level.

Methodology:

- **Lectures:** The faculty members of the department of English engaged various sessions on literary genres. Fr. Dr. Kuriakose V C and Ms.Theres Divia Sebastian gave the students an introduction into the world of literature. Dr. Santhosh P C engaged sessions on Poetry. Ms Josena K Joseph and Ms. Aswathy Cheriyan oriented the students about mesmerizing world of fiction. The sessions on Drama were conducted by Fr. Dr. Kuriakose V C and Ms.Theres Divia Sebastian.

- **Group Discussions:** Interactive sessions to encourage critical thinking and exchange of ideas among students.
- **Workshops:** Hands-on sessions focusing on writing and analyzing literary pieces.
- **Reading Assignments:** Selected readings from various genres to be completed and discussed in class.
- **Audio-Visual Aids:** Use of films, documentaries, and recorded performances to enhance understanding.

Outcome: The bridge course successfully introduced students to the rich and diverse world of English literature. Students gained:

- A foundational understanding of different literary genres and their characteristics.
- Enhanced analytical and interpretative skills through reading and discussing various literary works.

Conclusion: The bridge course effectively prepared the BA English Language and Literature students for their academic journey. By providing a comprehensive overview of literary genres and fostering critical thinking, the course laid a solid foundation for further literary studies.

Head of the Dept. of Englis
Pazhassiraja College, Pulpall

Principal
Pazhassi Raja College
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BRIDGE COURSE SYLLABUS 2023

Course Code	ENGBGCC
Title of the Course	Genres of English Literature: An Introduction
Semester in which course is to be taught	1
No of contact hours	15

OBJECTIVE OF THE COURSE:

- To familiarize the student with the different genres of literature
- To distinguish between the various subcategories of each genre

OUTCOME OF THE COURSE:

After this course the student will be able to:

- Identify the different genres of literature
- Identify the types of poetry, drama, and novel

COURSE SUMMARY

Module 1 : 3 hours

Module 2: 4 hours

Module 3: 4 hour

Module 4: 4 hours

Total 15 hours

COURSE DETAILS:

Module 1: What is Literature

Major Concepts- significance in contemporary world

Module 2: Introduction to Poetry

Origin of poetry – Types of poetry- Movements in poetry

Module : The Genre of Novel

Evolution of Novel- types of novel- famous authors and works

Module 4: The Genre of Drama

Origin of drama- golden period of drama- famous plays and playwrights

READING LIST:

Peter Womack and Simon Shepherd. *English Drama: A Cultural History*.Cambridge: Blackwell.1996

Philip Hosbaum. *Meter, Rhythm and Verse Form*.London: Routledge,2006

Tom Furniss and Michael Bath. *Reading Poetry – An Introduction*.London: Prentice Hall 1993

Watt,Ian.*The Rise of Novel*.University of California Press.2001

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Pazhassiraja College, Pulpally

Principal
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Pulpally.Pin:673574

Activity Schedule

21/08/2023		
10 am – 11 am	General Introduction and Ice breaking session	Ms. Josena K. Joseph Ms. Theres Divia Sebastian Ms. Aswathy Cheriyan
11 am – 12 pm	Introduction to English Literature	Fr. Dr. Kuriakose V. C.
12 am- 1 pm	Contemporary relevance	Ms. Theres Divia Sebastian
22/08/2023		
10 am- 11 am	Introduction to literary genres	Dr. Santhosh P. C.
11 am – 12 pm	Introduction to poetry	Dr. Santhosh P. C.
12 pm – 1 pm	Introduction to Fiction	Ms. Josena K. Joseph
2 pm – 3 pm	Introduction to Drama	Fr. Dr. Kuriakose V. C.
23/08/ 2023		
10 am- 11 am	Evolution of Novel	Ms. Josena K. Joseph
11 am – 12 pm	Origin of Drama	Ms. Theres Divia Sebastian
12 pm – 1 pm	Types of Fiction	Ms. Aswathy Cheriyan
2 pm – 3 pm	Golden Period of Drama	Fr. Dr. Kuriakose V. C.
24/08/2023		
10 am- 11 am	Types of poetry	Dr. Santhosh P. C.
11 am – 12 pm	Movements in poetry	Dr. Santhosh P. C.
12 pm – 1 pm	Famous Novelists and works	Ms. Aswathy Cheriyan
2 pm – 3 pm	Gamous plays and playwrights	Fr. Dr. Kuriakose V. C.

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Pazhassiraja College, Pulpally

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Pazhassi Raja College
Pulpally.Pin:673579

ATTENDANCE REGISTER OF 1 BA ENGLISH 2023 SCHOOL

BRIDGE COURSE

For the month of AUGUST 2023

Sl No	NAME
1	ALFRED RAJ
2	
3	ASHIN BIJU
4	
5	RENJITH K R
6	
7	JESWIN JAMES
8	
9	MUHAMMED NOON SHIBIL
10	
11	ANNLIYA BRIGITH VINSON
12	
13	MOUSHMI BIJU PR
14	
15	AISWARYA LAKSHMI ANIL
16	
17	SAIKA
18	
19	ASWATHI
20	
21	SAILAKSHMI S SHA
22	
23	DIYA SAJEEV. P
24	
25	ABISHEK TT
26	
27	RAMEESHA P
28	
29	PARVATHY PS
30	
31	DIYA P P
32	
33	NAFLA RAHMAN
34	
35	GEETHIKA KRISHNA MP
36	
37	ANJIMA V.K
38	
39	GILNA K.L
40	
41	NIDHA FEBIN P
42	
43	ANOOJA E A
44	
45	
46	
47	
48	
49	
50	
51	

Days / Date: 1 2 3 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

No. of days present | Present up-to-date | % of Attendance | Admission Fee Rs | Date of

Head of the Dept. of English
Pazhassiraja College, Pulpally

Principal
Pazhassi Raja College
Pulpally Pin: 673579

TOTAL WORKING DAYS TH	PRESENT MONTH	TOTAL

at the
n the month .....

Daily Attendance	FN
	AN
Initial of Class Teacher	FN
	AN

Fees Collected Rs.	No.
Current	No.
Arrear	
Fine	No.
Total	the
Class Teacher	

PAZHASSIRAJA COLLEGE, WAYANAD

DEPARTMENT OF HISTORY

Bridge Course 2023-24

Date of Commencement:

From 01/09/23

BRIDGE COURSE- 2023-24

I. What is Bridge Course?

A bridge course is a type of educational program that helps students transition from one educational level to another. Bridge Course is designed to provide students with a solid foundation in the basic academic skills and knowledge they need to succeed in their college studies. The Bridge Course is a class or series of classes that help students to acquire knowledge about the topics that will be covered in their new courses.

The Department of History regularly organizes and conducts bridge courses for the newly admitted UG students before the commencement of their first semester classes. The main objective of the course is to bridge the gap between subjects that they are studied at plus two or Graduate level and subjects they would be studying in their new UG Programme. The course is available to all the first-year students in some subjects which need extra preparation and we also provide them some instructions before beginning their college programme. The Bridge Course is designed and taught by faculty members of the department, helping students develop a more well-rounded understanding of core concepts in the Subject.

II. Benefits of Bridge Course

There are a number of benefits to taking a bridge course before starting college-level courses. These include:

1. Establishing a stronger foundation in fundamental subjects, helping students overcome any challenges they may face when transitioning to college-level coursework.

2. Providing students with better preparation for entering college-level courses, helping them feel more confident and prepared as they start their studies.

3. Acting as a "cradle" or support system for new students, providing them with the tools and knowledge they need to succeed in higher education.

4. Offering interactive and dynamic learning opportunities that engage students and help them build the skills and knowledge needed for success in college-level courses.

III. History Student Induction Program (HSIP)

HSIP, a bridge course is offered as a one-week/ 10 Days intensive course before the commencement of regular classes to I UG students. To implement the bridge course in a systematic way, the Dept. adopted the following procedure.

1. Members of the staff from Dept of History and Political Science are involved in the bridge course. Course materials and lesson plans are designed exclusively for HSIP.

2. On Day 1, the students take an Entry-level test and on Day 6/ 10 the Exit-level test.

3. Based on the scores of the Entry-level test and demographic details, the Course materials were prepared by the teachers based on the knowledge level and activities were conducted for the students.

4. Around 40 students benefit from the bridge course. The sessions are arranged between 10.00 A.M. and 3.30 P.M.

5. At the end of the session, the students wrote an exit level test and filled the feedback form.

6. Based on their performance in the exit level test, the students were streamlined in to Advanced and Slow Learners. The department arranged special sessions every Saturday, if needed, where the teachers will clear students' doubts.

IV. Syllabus for Bridge Course in History

SESSION I. - A GLIMPSE INTO THE CAMPUS & THE DEPARTMENT-

General Discipline, Dos and Don'ts in the Campus and the Department

SESSION II. THE PROGRAMME- AN OVERVIEW- Curriculum discussion,

Programme Outcomes, Co-curricular and Extra Curricular Activities

SESSION III. COURSE STRUCTURE- five types of courses,

Common Courses (Code A), Core courses (Code B),

Complementary courses (Code C), Open Course (Code D) and

Ability Enhancement courses/ Audit courses (Code E),

Elective Course, PROJECT

SESSION IV. Common Courses- English & Malayalam/ Hindi-

Importance of Language & Communication Skill, MOOC/SWAYAM Courses

SESSION V. ABOUT THE ASSESSMENT AND EVALUATION-

Internal Evaluation and External Evaluation

Evaluation of Audit courses

Method of Indirect Grading,

External Examination Scheme,

Credit Distribution of the Programme

SESSION VI. CALICUT UNIVERSITY SOCIAL SERVICE PROGRAMME (CUSSP),

Study Tour, Additional/Extra Credit Schemes- NSS, NCC

SESSION VII. Presentation- Seminars and Assignments, Field Visit

SESSION VIII. Core Courses at a Glance- Trends in Historiography,

SESSION IX- Core Course At A Glance-

Indian History-I, II, III & IV, World History I, II & III

Kerala History I & II

SESSION X. Methodology of Historical Writing, Gender Studies,

History of Archaeology in India, Indian Heritage and

Plurality of Cultures.

HSIP 2023-24

SL. NO.	NAME OF THE FACULTY	TOPIC OF DISCUSSION (with Date)	NO. OF STUDENTS BENEFITTED	SIGNATURE OF THE FACULTY
1	Lt. Dr. Rani S. Pillai	A Glimpse into the Campus & The Department- general Discipline, class decorum	45	
2	Dr. Joshy Mathew Mrs. Lizy P.K	The Programme- an Overview	45	
3	Mr. Jobish Joseph	Course Structure- Common Courses, LMS/ MOODLE Course	40	
4	Mrs. Lizy P.K	CUSSP, Study Tour, Project, Additional/Extra Credit Schemes- NSS, NCC	37	
5	Lt. Dr. Rani S. Pillai	About the Assessment and Evaluation	40	
6	Mr. Jobish K. Joseph Mr. Manoj Mathew	About the Assessment and Evaluation - Indian Constitution, International Politics	"	
7	Dr. Joshy Mathew Mrs. Lizy P.K	Core Courses- At A Glance Indian History, World History,Kerala History	"	
8	Mrs. Lizy P.K Lt. Dr. Rani S. Pillai	Assignment & Seminar Guidelines, Field Visit Core Courses at a Glance- Trends in Historiography,	"	
9	Lt. Dr. Rani S. Pillai	Methodology of Historical Writing, Gender Studies,	"	
10	Mr. Manoj Mathew	Parliamentary Literacy Club, other clubs	"	
11	Lt. Dr. Rani S. Pillai	History of Archaeology in India, Indian Heritage and Plurality of Cultures.	"	

Signature of Coordinator

Signature of HoD

HEAD
Dept. Of History
Pazhassiraja College
Pulpally, Wayanad, 673579

PAZHASSIRAJA COLLEGE
DEPARTMENT OF HISTORY
BRIDGE COURSE 2023-24

List of Students

SL NO	Reg. No.	NAME	Signature
1	PZAXAHIR01	AYISHA NAHLA	
2	PZAXAHIR02	FATHIMA SANA K M	
3	PZAXAHIR03	SRUTHI THERESA	
4	PZAXAHIR04	ALBIN PAUL	
5	PZAXAHIR05	AMGIRAS M S	
6	PZAXAHIR06	ANAL SAJI K.S	
7	PZAXAHIR07	ANAND KRISHNA	
8	PZAXAHIR08	KEERTHANAN P G	
9	PZAXAHIR09	KIRAN VINOD	
10	PZAXAHIR10	ABHISHA K P	
11	PZAXAHIR11	AMAYA N	
12	PZAXAHIR12	ANJANA P	
13	PZAXAHIR13	ARCHANA E P	
14	PZAXAHIR14	ARYANANDHA K	
15	PZAXAHIR15	AYANA C	
16	PZAXAHIR16	AYISHA AGNA K	
17	PZAXAHIR17	BINSI T K	
18	PZAXAHIR18	CHAITHANYA O	
19	PZAXAHIR19	DILNA B S	
20	PZAXAHIR20	FATHIMA FITHA . K	
21	PZAXAHIR21	FATHIMA SAHILA M P	
22	PZAXAHIR22	FATHIMA SAJMI	
23	PZAXAHIR23	GOURI P	
24	PZAXAHIR24	INDUVADANA C M	
25	PZAXAHIR25	KRISHNANJANA C T	
26	PZAXAHIR26	NAJLA THASNI K	
27	PZAXAHIR27	NANDANA B S	
28	PZAXAHIR28	NANDHANA K G	
29	PZAXAHIR29	NIYA FATHIMA K	
30	PZAXAHIR30	POOJA K M	
31	PZAXAHIR32	RAHANA FATHIMA T K	
32	PZAXAHIR33	SINUMOL. K. P	

PAZHASSIRAJA COLLEGE
DEPARTMENT OF HISTORY
BRIDGE COURSE 2023-24

List of Students

33	PZAXAHIR33	SYAMILI K	
34	PZAXAHIR34	ABINANDH SAJI	
35	PZAXAHIR35	AKARSH SHAJI	
36	PZAXAHIR36	AKASH. K. P	
37	PZAXAHIR37	ANAND A R	
38	PZAXAHIR38	ASIF ISMAIL	
39	PZAXAHIR40	JOMITT JOSE	
40	PZAXAHIR41	MUHAMMED NOUSHEED	
41	PZAXAHIR42	SAJITH SADASIVAN	
42	PZAXAHIR43	TINU PRAKASH K	
43	PZAXAHIR44	VYSHNAV C S	

DQAC

Lt. Dr. Rani S. Pilla

Department of History
Pulpally-673579
Wayanad-Kerala
Pazhassiraja College

Head of the Department

Dr. JOSHY MATHEW
Head of the Department
of History
Pazhassiraja College,Pulpally
Wayanad- Pin:673579- Kerala

Principal

BRIDGE COURSE

2023-2024

JOURNALISM & MASS COMMUNICATION
Pulpally
Wayanad
Kerala -673 579
PAZHASSIRAJA COLLEGE

Dr.JOBIN JOY MCJ, Ph.D.
HoD & Assistant Professor
Journalism & Mass Communication
Pazhassiraja College, Pulpally
Wayanad - 673 579

Principal
Pazhassi Raja College
Pulpally.Pin:673579

Department of Journalism and Mass Communication
Pazhassiraja College Pulpally
Bridge Course – 2023 -2024 (Date on 01/08/23 to 04/08/2023)

Course objectives :

- **Introducing students to the field of mass communication and journalism.** This includes providing an overview of the different sectors of the media industry, the history of mass communication, and the key concepts and theories in the field.
- **Fostering an understanding of the ethical principles of mass communication.** This includes discussing the importance of truth, accuracy, and fairness in journalism, as well as the role of the media in society.
- **Providing students with hands-on experience in different areas of mass communication.** This may include coursework in news writing, reporting, photography, videography, editing, and web design.

Course outcome :

By the end of the course, students will be able to:

- Explain the different sectors of the media industry.
- Identify the key concepts and theories in mass communication.
- Write clear and concise news articles.
- Conduct research and interviews.
- Edit and produce multimedia content.
- Apply ethical principles to their work.

Students will develop an understanding of the following:

- The history of mass communication.
- The role of the media in society.
- The importance of truth, accuracy, and fairness in journalism.

Dr.JOBIN JOY MCJ, Ph.D.
HoD & Assistant Professor
Journalism & Mass Communication
Pazhassiraja College, Pulpally
Wayanad - 673 579

Students will have the opportunity to gain hands-on experience in following areas:

- News writing
- Reporting
- Photography
- Videography
- Editing

Increased knowledge of the media industry: Bridge courses can provide students with an overview of the media industry, including its history, different sectors, and current trends. This can help students to make informed decisions about their future careers in journalism and mass communication.

Module 1: Introduction to Mass Communication – Cristeena Joseph

History of mass communication
The different media of mass communication
The role of mass communication in society
The ethics of mass communication

Module 2: Newsgathering and Reporting – Kesiya Jacob

The news cycle
How to write a news story
How to conduct interviews
How to research a story

Module 3: Principles of Journalism – Jibin Varghese

The news cycle
The different types of news stories
How to write a news story
How to interview sources

Module 4: Media Writing – Lincy Joseph

The different types of media writing
How to write for different audiences
How to use grammar and punctuation correctly
How to edit your own work

Module 5: Media Production – Shobin Mathew

The different aspects of media production
How to use video and audio equipment
How to edit video and audio footage
How to create a multimedia presentation

Module 6: Public Relations and Advertising – Jibin Varghese

The basics of public relations
The basics of advertising
How to use public relations and advertising in the media

Module 7: Media Law – Cristeena Joseph and Shobin Mathew

The different laws that govern mass communication
How to avoid copyright infringement
How to protect your sources
How to deal with libel and slander

Module 8: Careers in Mass Communication – Dr.Jobin Joy

The different career paths in mass communication
How to get a job in mass communication
How to advance your career in mass communication

No.	Name of Student	signature
1	Abhishek T T	
2	Abhith Prasad	
3	Abina Vijayan	
4	Ajanya N	
5	Akash	
6	Akshay	
7	Alakananda K H	
8	Angel Maria Jose	
9	Bashila I K	
10	Basil Saji	
11	Dhirana V S	
12	Jishnu	
13	Navya V A	
14	Sana Fathima	
15	Sravana Ramesh	
16	Theertha K M	
17	Treesa A C	
18	Pavan	
19	Nandana	
20	Namitha	
21	Vinaya	
22	Archana	
23	Rameesa	

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JOURNALISM & MASS COMMUNICATION
Pulpally
Wayanad
Kerala -673 579
PAZHASSIRAJA COLLEGE

Principal
Pazhassi Raja College
Pulpally.Pin:673579

Department of Microbiology
PAZHASSIRAJA COLLEGE
(Affiliated to the University of Calicut)
Pulpally,Wayanad, Kerala 673579
NAAC re-accredited by A+ grade.
microbiology@prc.ac.in

IQAC

Bridge course -Basic of Microbiology

Department of Microbiology

Pazhassiraja College, Pulpally

Syllabus

Preamble of the Syllabus:

This course is designed for First Year B.Sc. Microbiology learners, to be completed in fifteen hours. The topics prescribed in the syllabus mainly emphasis on general introduction to the microbial World covering basic concepts and types of microorganisms. This course will fill the gap of subject knowledge between higher secondary and undergraduate studies. This course may be helpful to learners enrolled for BSc Microbiology to decide their career goals.

Objectives of the Course:

- To make the learners aware about diversity of microorganisms
- To make the learners aware about scope of Microbiology
- To make the learners familiar with reference books in Microbiology

Course Outcome:

By the end of the course: Learners will develop interest in the subject of Microbiology and it will also be useful to fill the gap of subject knowledge between higher secondary and graduate studies.

Bridge Course in Basic of Microbiology: For this course there shall be only one paper for 15 lectures comprising of four modules.

Module-I: Evolution and Biology

Module-II: Introduction to Microbiology

Module-III: Microbiology Instrumentation

Module-VI: Scope of Microbiology

Scheme of Examination: Examination: 20 Marks will be as follows -:

Question 1	Objectives Questions with options: MCQs, Fill in the Blanks, Match the pairs, Definations/Concepts.	20 Marks

Bridge course in Basic of Microbiology: For B.Sc Microbiology

Detailed Syllabus to be implemented from the Academic year 2021-22

Module-I. Evolution and Biology i. Evolution and Science ii. Genetics	
Module-II: Introduction to Microbiology i. Microbial Diversity: ii. Reference books for Microbiology	
Module-VI: Microbiology Instrumentation i. Basic lab instruments ii. Laboratory Design	
2 Scope of Microbiology- i. Job Opportunities ii. Higher studies	

Department of Microbiology
Pazhassiraja College
Pulpally(P.O), Wayanad

Principal
Pazhassi Raja College
Pulpally Pin:673579

DEPARTMENT OF MICROBIOLOGY
PAZHASSIRAJA COLLEGE, PULPALLY
B.Sc. Microbiology
BRIDGE COURSE
2023-24
Time table for the Bridge Course (1/8/23-4/8/23)

DAY	1 HOUR	2ND HOUR	3RD HOUR	4TH HOUR
TUESDAY	VJ	LJ	NG	NF
WEDNESDAY	SC	NG	AB	LJ
THURSDAY	LJ	VJ	NF	NG
FRIDAY	AB	NG	SC	NF

SYLLABUS

MICROBIOLOGY BRIDGE COURSE

Objectives of the Course:

- To create awareness about scope of microbiology and carrier opportunities.
- To stimulate interest and curiosity in microbial science
- To increase student motivation to learn science

Course Outcome:

- Learners will develop interest in the subject of Microbiology and it will also be useful to fill the gap.
- Stimulating interest and curiosity in Microbiology will increase student motivation to learn applied areas of microbiology.

Unit I: Science and microbiology

Evolution of life, Introduction to human physiology, Need for microbiology literacy in society, Scope and Carrier opportunities in Microbiology.

Unit II: Miracles from Microbes

Importance of microbiology in daily life. Introduction to microbial diversity, Introduction to environmental sciences.

Unit III

Chemistry and function of macromolecules, Biophysical chemistry and instrumentation Concepts in metabolism, Advanced concepts in biochemistry

Unit IV

Introduction to Information Technology, Role of IT in Education, Emerging Technologies

Unit V

Introduction to Statistics, Collection of Data, Types of Data, Classification and Tabulation.

Department of Microbiology
Pazhassiraja College
Pulpally(P.O), Wayanad

Principal
Pazhassi Raja College
Pulpally. Pin:673573

DEPARTMENT OF MICROBIOLOGY

PAZHASSIRAJA COLLEGE, PULPALLY

Bridge course attendance

SI NO.	REG.NO	NAME	Day-1	Day-2	Day-3	Day-4
1	PZAXSMB001	ALAKANANDHA E S				
2	PZAXSMB002	ANAMIKA N				
3	PZAXSMB003	DIYA S J				
4	PZAXSMB004	FARSANA.M.S				
5	PZAXSMB005	KHADEEJATHU NAIEMA				
6	PZAXSMB006	MONISHA.M				
7	PZAXSMB007	SELVA SHERIN				
8	PZAXSMB008	SIVANI SUMESH				
9	PZAXSMB009	SNEHA C K				
10	PZAXSMB010	SREYA VINOD V				
11	PZAXSMB011	AADINADHAN				
12	PZAXSMB012	ABHISHEK P P				
13	PZAXSMB013	ARJUN. V. B				
14	PZAXSMB014	MOHAMMED ANSHAD				
15	PZAXSMB015	RITHIN RAJ				
16	PZAXSMB016	GOPIKA PRAKASH P				
17	PZAXSMB017	MALAVIKA THAMBI K				
18	PZAXSMB018	NAYANA.M.P				
19	PZAXSMB019	NOUSHABA JASMINE				
20	PZAXSMB020	SAFA FATHIMA.P				
21	PZAXSMB021	SALIMA C S				
22	PZAXSMB022	SANDRA. C. M				
23	PZAXSMB023	SANIYA JOSEPH				
24	PZAXSMB024	SHAHIN MEHJABIN P				
25	PZAXSMB025	AMAL J				
26	PZAXSMB026	AMARJITH VIJAY P				
27	PZAXSMB027	SOORAJ V C				

Department of Microbiology
Pazhassiraja College
Pulpally(P.O), Wayanad

Principal
Pazhassi Raja College
Pulpally, Pin:6[illegible]

DEPARTMENT OF TRAVEL AND TOURISM MANAGEMENT

Pazhassiraja College
Pulpally, Wayanad.

26/07/2023
23-24

To

The Principal
Pazhassiraja College

Sir,

The classes for the first year degree programme will start soon. Students are from diverse social, economic and educational backgrounds. Higher education in travel and tourism needs augmented learning experience and professionalism needs to be instilled among the students to aim high. Also, the nature of learning is bit different from school levels and they have to study diverse subjects, strictly in English. Therefore, the department council suggests to have a bridge course, spanning over three days. We request you to approve a bridge course, titled 'Transfer to Travel and Tourism Management'.

Thanking you,

Truly,

Head of the Department

PRINCIPAL IN- CHARGE
PAZHASSIRAJA COLLEGE
PULPALLY - 673579

SHELJI MATHEW
Associate Professor & Head
Dept. of Travel and Tourism Manageme
Pazhassiraja College Pulpally
Wayanad (Dt), 673579

TRANSFER TO TRAVEL AND TOURISM MANAGEMENT

BRIDGE COURSE

Course Description

The course is designed to fully prepare students to face the challenge of learning a professional programme in travel and tourism management. After the completion of the course, students get prepared to study the courses of BTTM programme in a better manner and to score well, along with getting the skills and attributes needed to pursue a higher education or a suitable career in the global travel and tourism sector.

Syllabus

- Travel and Tourism: Introduction and the multi-disciplinarily, Tourism industry elements.
- Tourism Industry and Career opportunities. Types, qualifications needed Travel and tourism professional-attributes and characteristics.
- Travel, tourism and hospitality industry: The need of language skills. English vocabulary development and academic reading and writing. Terms used in tourism and hospitality sectors.
- Etiquettes, manners and body language (Basic training)
- Introduction to complementary courses and methods to learn and score well.

Pedagogy

Classroom lectures, video showing, presentations, case studies and one-to-one interactions.

References:

- M.R. Dileep, (2018). Tourism-Concept, Theory and Practice, IK International, New Delhi. ISBN 978-93-85909-67-2.
- Sampad Kumar Swain and Jitendra Mohan Mishra (2011). Tourism: Principles and Practices, Oxford University Press. New Delhi.
- IATA Training programme inventory and brochures.
- Calicut University BTTM Curriculum 2019.

TRANSFER TO TRAVEL AND TOURISM MANAGEMENT

BRIDGE COURSE 2023

SCHEDULE

Day 1: 10.00 AM-01.00 PM: Shelji Mathew/Mr. Shaijumon P .V

02.00 – 4.00 PM: Mr.Sanoop Kumar P.V/Ms. Anu T.P

Day 2: 10.00 AM-01.00 PM: Ms. Divya Das/ Mr.Shelji Mathew.

02.00 – 04.00 PM: Ms. Neetha Francis

Day 3: 10.00 AM- 01.00 PM: Ms.Lintu Jose

02.00 – 04.00 PM: Ms.Renju Thomas.

Day 4: 10.00 AM -01.00 PM Mr.Sanoop Kumar P.V/Mr.Shelji Mathew

02.00 -04.00 PM: Ms. Renju Thomas/Ms.Lintu Jose

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PRINCIPAL IN-CHARGE
PAZHASSIRAJA COLLEGE
PULPALLY - 673579

SHELJI MATHEW
Associate Professor & Head
Dept. of Travel and Tourism Management
Pazhassiraja College Pulpally
Wayanad (Dt), 673579

	1	AABEL GEORGE
	2	ABHAY RAJ
	3	ABHIJITH VISWAMBHARAN
	4	ABHINAND SHIJU
	5	ABHIRAMI V KRISHNAN
~~3500~~	6	ADITHYA VINOD
	7	AJINJITH KJ
	8	AJITH TV
	9	AKHINESH KT
	10	AKSHAY SHAJI KV
~~3500~~	11	AMAYA KRISHNA KV
	12	ANAGHA M
	13	ANAMIKA PA
	14	ANNEX ROYAL
	15	ANUNANDANA ANEESH
	16	ARCHANA S
	17	ARDHRA V
	18	ARYA PH
	19	ASHWIN SB
	20	AVANDHIKA K
	21	BIBIN CB
	22	DANIYA SALAM V
	23	JISHNU CS
	24	MUHAMMAD OUSE E
	25	MUHAMMED RAZIN ASHRAF
~~3500~~	26	PANCHAMI CM
	27	RINA FATHIMA CM
	28	RIYA RASHEED CH
	29	SHALFIN SHAJI
	30	VISMAYA P
	31	ATHUL K S
	32	VINAYAK RAMESH
	33	SOORYA SINTIL
	34	NIDHIN DAS
	35	VAISHNAVI C MOHAN
	36	NANDHANA SURESH
	37	JUSTIN BABY
	38	AMAL KRISHNA
	39	NAMITHA VIJAYAN
	40	JINSHANA FEBIN
	41	SHAN
	42	ALAN JOSE
	43	NAHLA
	44	ANAND BIJU
	45	RAMEESA P P

TOTAL WORKING DAYS		
PREVIOUS MONTH	PRESENT MONTH	TOTAL

No. on roll at the begining in the month .....

Daily Attendance

Initial of Class Teacher

FN
AN
FN
AN

	45	ALAN JOSE
	47	NAHLA
	48	ANAND BIJU
	49	RAMEESA P.P
46	50	KASINATH.P
47	6	Muhammed Yasid
48	7	Mohammad Rishad Fahim
49	8	Muhammed Mushafa
50	9	Nissam V.K
51	10	Muhammed Rameez.K.
52	11	Muhammed Nebeu
53	12	Abdul Rahnas - k
54	13	Abhinav V.R
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SHELJI MATHEW
Associate Professor & Head
Dept. of Travel and Tourism Management
Pazhassiraja College, Pulpally
Wayanad (Dt), 673579

FAZHASSI RAJA COLLEGE
Date.....
PULPALLY, WAYANAD, 673579

TOTAL WORKING DAYS			Daily Attendance	FN
PREVIOUS MONTH	PRESENT MONTH	TOTAL		AN
			Initial of Class Teacher	FN
No. on roll at the begining in the month				AN