ANNAMALAI UNIVERSITY

(Accredited with 'A' Grade by NAAC)

FACULTY OF AGRICULTURE

(Accredited by ICAR)

DEPARTMENT OF AGRICULTURAL EXTENSION

Academic Regulations and Syllabi

DOCTOR OF PHILOSOPHY IN AGRICULTURAL EXTENSION EDUCATION

Under Choice based credit system (CBCS) with Outcome based Education

2022-2023 Onwards

COMMON REGULATIONS FOR ALL Ph.D. PROGRAMMES OF FACULTY OF AGRICULTURE

(*w.e.f. 2022-2023*)

1. DEFINITIONS

1.1 An **"Academic year"** shall consist of two semesters.

1.2 **"Semester"** means an academic term consisting of 110 instructional days excluding final theory examinations.

1.3 **"Course"** means a unit of instruction to be covered in a semester having specific No., title and credits.

1.4 **"Credit hour"** means, one hour lecture plus two hours of library or homework or two and half hours of library/field practical per week in a semester.

1.5 **"Credit load"** of a student during a semester is the total number of credits registered by that student during that particular semester.

1.6 "**Grade Point"** of a course means the value obtained by dividing the percentage of marks earned in a course by 10 and the Grade Point is expressed on a 10 point scale and rounded off to two decimal places.

1.7 **"Credit Point"** means the grade point multiplied by corresponding credit hours.

1.8 **"Grade Point Average (GPA)"** means the quotient of the total credit points obtained by a student in various courses at the end of each semester, divided by the total credit hours taken by the student in that semester. The grading is done on a 10 scale and the GPA has to be corrected to two decimals.

1.9 **"Overall Grade Point Average (OGPA)"** means the quotient of cumulative credit points obtained by a student in all the courses taken from the beginning of the first semester of the year divided by the total credit hours of all the subjects which he/she had completed up to the end of a specified semester and determines the overall performance of a student in all subjects during the period covering more than one semester. The OGPA has to be arrived at the second decimal place.

2. SYSTEM OF EDUCATION

2.1 These rules and regulations shall govern the Ph.D. programmes leading to the award of Degree of Doctor of Philosophy in the concerned subject in the Faculty of Agriculture, Annamalai University. They shall come into force with effect from the academic year 2022-2023.

2.2 The semester system shall be followed for all the Ph.D. degree programmes. The duration of doctoral programmes is as follows:

2.2.1 The duration of the programme and the time for admission of thesis are counted from the date of provisional registration.

2.2.2 The minimum duration of the programme is three years and the maximum duration of the programme shall be seven years.

2.2.3 Break of study shall be granted up to a maximum period of one year and it can be done only after completing the course work. Such request shall be made in advance by scholar in writing with the recommendation of Supervisor, Head of the Department (HoD) and Dean, Faculty of Agriculture and it should reach the Director, Directorate of Academic Research (DARE). The orders for the break of study shall be issued by the Director, DARE after assessing the need.

2.2.4 If prior permission is not sought and obtained, it will be considered as a case of discontinuation and action will be taken to cancel the registration of such scholars.

2.2.5 The scholars should remit the yearly fees during the break of study also.

3. PROGRAMMES OFFERED

The details of various Ph.D. programmes offered in the Faculty of Agriculture are as follows:

1. Agri- Business Management
2. Agricultural Economics
3. Entomology
4. Agricultural Extension Education
5. Agricultural Microbiology
6. Agronomy
7. Genetics and Plant Breeding
8. Horticulture in Fruit Science
9. Horticulture in Vegetable Science
10. Horticulture in Floriculture and Landscaping
11. Horticulture in Plantation, Spices, Medicinal and Aromatic plants
12. Plant Molecular Biology and Biotechnology
13. Plant Pathology
14. Seed Science and Technology
15. Soil Science

4. ELIGIBILITY FOR ADMISSION

Candidates seeking admission to Ph.D. programme should satisfy the following requirements.

4.1 Candidates with two year master's degree programmes from Universities recognized by Annamalai University are eligible to apply for Ph.D. programmes of the university (Table 1).

4.2 Candidates who have undergone the programme under conventional system should possess not less than a second class Master's degree. The candidates under trimester system should possess a minimum OGPA of 3.00 out of 4.00. For those under semester system 7.00 out of 10.00 is required for various Doctoral programmes.

Table 1: Eligibility Criteria

Doctoral Degree Programmes	Eligibility

1. Agri Business Management	MBA in Agribusiness / MBA Agri Business Management
2. Agricultural Economics	M.Sc. (Ag.) in Agrl. Economics / Agricultural Marketing Management
3. Entomology	M.Sc. (Ag.) in Entomology / Agricultural Entomology
4. Agricultural Extension Education	M.Sc. (Ag.) in Agricultural Extension / Agricultural Extension and Communication / Agricultural Extension Education / Extension Education
5. Agricultural Microbiology	M.Sc. (Ag.) in Agricultural Microbiology
6. Agronomy	M.Sc. (Ag.) in Agronomy
7. Genetics and Plant Breeding	M.Sc. (Ag.) in Genetics and Plant Breeding
8. Horticulture in Fruit Science	M.Sc. (Hort.) / M.Sc. (Hort.) in Fruit Science
9. Horticulture in Vegetable Science	M.Sc. (Hort.) / M.Sc. (Hort.) in Vegetable Science
10. Horticulture in Floriculture and Landscaping	M.Sc. (Hort.) / M.Sc. (Hort.) in Floriculture and Landscape Gardening / Floriculture and Landscape Architecture / Floriculture and Landscaping
11. Horticulture in Plantation, Spices, Medicinal and Aromatic plants	M.Sc. (Hort.) / M.Sc. (Hort.) in Plantation, Spices, Medicinal and Aromatic Crops
12. Plant Molecular Biology and Biotechnology	M.Sc. (Ag.) in Plant Molecular Biology / Agricultural Biotechnology
13. Plant Pathology	M.Sc. (Ag.) in Plant Pathology
14. Seed Science & Technology	M.Sc. (Ag.) in Seed Science & Technology
15. Soil Science	M.Sc. (Ag.) in Soil Science and Agricultural. Chemistry / Soil Science

4.3 All research scholars shall undergo course work for two semesters as prescribed by the Department. Duration of the programme will be for three years.

4.3.1 The Ph.D. scholars shall report in the Department and sign every day in the attendance register. In order to promote quality research and training in cutting edge areas, the University may permit the scholar to conduct research in recognised universities/research institutes, after the completion of qualifying Viva voce examination.

4.3.2. Project staff/ fellow working in projects in the University, sponsored by Government of India/ Industries / Government of Tamil Nadu can also register.

4.3.3. Candidates in employment should be sponsored by their employer and should avail leave for the minimum duration of the programme and should be formally relieved from their duty to register.

4.3.4. Candidates who are selected under the national level fellowship programmes or by any recognized bodies and who satisfy the eligibility conditions as per the regulations shall apply in the respective discipline.

4.3.5. Admission to Foreign Students: Foreign students, who are selected under various scholarship schemes, either by the Ministry of Education and Culture or by the Ministry of External Affairs, will be given admission on the recommendation / sponsorship of the respective Ministry of Government of India. The other foreign students who seek admission should possess a research VISA issued by the Indian Embassies aboard and produce "No Objection Certificate" from the Ministry of Human Resource Development, Government of India, after clearance from the Ministry of External Affairs. They should also show proof for financial capability for staying, pursuing Ph.D. programme for three years.

5. MODE OF SELECTION

5.1. University shall issue notification for Ph.D. admission in starting of academic year.

5.2. The candidates desirous of registering for Ph.D. programme shall apply by filling all the relevant details mentioned in the online application form posted in the University website and submit completed application online before the due date as indicated in the notification issued from time to time.

5.3 Incomplete applications and applications with false information in any respect shall be summarily rejected without any intimation to the candidate.

5.4. The Departmental Research Committee (hereafter referred to as DRC) of concerned Department shall screen the applications as per the eligibility norms and shall conduct the written test and interview only for eligible candidates.

5.5. The admission to Ph.D. students shall be based on the following criteria besides general eligibility.

5.5.1 An entrance test at post graduate level for 70 marks (70 multiple choice questions (MCQs), each question carrying one mark and duration of the test is 90 minutes followed by an interview that will have a weightage of 30 marks.

5.5.2 The candidates who secure 50% marks in entrance test and interview are eligible for admission.

5.5.3 A relaxation of 5 % marks (from 50 % to 45%) shall be allowed for the candidates belonging to SC/ST/OBC (non creamy layer)/ differentially able category.

5.5.4 Candidates with UGC- JRF / NET / ICAR/ICSSR qualified candidates and teacher fellowship holders are exempted from the Entrance test but they have to appear for the interview and evaluated for 100 marks.

5.6 Departmental Research Committee: The following is the constitution of the DRC. The members other than Head of the Department shall serve only for one academic year.

Designation	Members
Head of the Department	Convener
Two professors/ Senior Faculty nominated by the Vice-Chancellor in rotation	Members
One Associate Professor (in rotation)	Member
One Assistant Professor (in rotation)	Member

5.7. The DRC has the following functions

5.7.1 Selection of candidates for admission to the Ph.D. programme.
5.7.2 Facilitating research facilities in the Department.
5.7.3 Maintenance of research quality and quality of publications.
5.7.3 Sorting out any other research related issue of the Department.

5.8. If there is any dispute either in the constitution of functioning of the DRC, it shall be brought to the notice of the Director, DARE and the decision of the Vice-Chancellor shall be final.

5.9. The minutes of the DRC together with the list of selected candidates and their research supervisors along with recommendations of the Dean of the respective faculty will be placed before the Vice-Chancellor for approval.

6. ADMISSION

6.1. The selected candidates shall be issued admission cards and they will be admitted to Ph.D. programme in the respective Department based on his/her PG qualification, entrance and interview.

6.2. The provisional registration order for Ph.D. shall be issued to the candidates.

6.3. The scholar, supervisor, Research Advisor Committee members and examiners shall not be relatives to one another.

7. TUITION FEES AND OTHER FEES

7.1 The selected candidates shall pay the prescribed fees before the last date mentioned in the selection order, failing which they will forfeit the seats.

7.2. The yearly fees shall be paid by the scholars within the prescribed date till the scholar submits the thesis. The supervisors should monitor the regular payment of yearly fees by those scholars who are working under them.

7.3. The registration is liable for cancellation, if the research scholar has not paid the yearly fees within stipulated time.

7.4 Non-payment of yearly fees is a serious lapse on the part of the scholars. Explanation for non-payment of yearly fees shall be called for from the supervisors.

7.5 The various fees payable by the students will be decided by the university from time to time.

7.6 Admission to the hostel will be strictly restricted to the actual accommodation available and no associate will be allowed. A Ph.D. student may be allowed to stay in the hostel for a maximum of five years from the date of admission to the Ph.D. programme.

8. CREDIT GRADE POINT REQUIREMENTS

8.1. A student enrolled for Doctoral program is required to complete 100 credits inclusive of 75 credits of research to become eligible for the degree as detailed below:

Sl. No.	Details	Credit Hours
1	Major Courses	12
2	Minor Courses	6
3	Supporting Courses	5
4	Seminar	2
5	Research	75
	Non credit Compulsory courses	
	Research and Publication Ethics (Contact hours: 2) MOOC (Contact hours: 2)	
	Total	**100**

8.2. In a semester, a Ph.D. scholar can register a maximum of 15 credits excluding research. However, the research credits registered should not exceed 16 per semester. Semester-wise distribution of credits is given in the respective Ph.D. programmes.

8.3. Registration Card: A student shall register the courses offered in a semester by writing all the courses in registration card in quadruplicate. The Supervisor, Ph.D. Coordinator and Head of the Department are responsible to furnish the registration particulars of the students with their signature in the Registration card to the Dean. The Dean shall approve the registration cards. The approved registration cards shall be maintained by the HoD, Supervisor and the student concerned. The list of courses registered by the students in each semester shall be sent by the Dean to the DARE for preparation of Report Cards.

8.4. The Ph.D. students should complete their course work within the first two semesters in Annamalai University campus.

8.5. Requirements for Ph.D. programme shall also include successful completion of Non-Credit Compulsory Courses, thesis research in the major field of study and submission of thesis thereon.

9. ATTENDANCE REQUIREMENT

9.1 One hundred per cent attendance is expected from each scholar. A student who fails to secure 80 per cent of attendance in each subject separately for theory and practical, shall not be permitted to appear for the final examination in that subject and shall be awarded ‘E’ (incomplete) and will be required to repeat the course whenever offered.

9.2 In respect of the student who has absented himself / herself for classes with or without valid reasons, that period will be treated as absence only and not as leave. Also, no attendance will be given for writing make up tests.

9.3 In case of new admission, for calculating 80 percent attendance in the first semester, the number of working days will be calculated from the date of joining of the students who are permitted to join late due to administrative reasons. However, for genuine reasons, condonation of attendance deficiency may be considered by the Vice - Chancellor on the recommendation of the Research Advisory Committee, HoD and Dean, Faculty of Agriculture on payment of condonation fee prescribed by the university.

9.4 Students absenting from the classes with prior permission of the HoD on official University business shall be given due consideration in computing attendance.

9.5 In respect of students who had absented for the mid-semester examination (MSE) on university business with prior permission of the HoD and Dean, Faculty of Agriculture, the makeup first test should be conducted ordinarily within 15 working days from the date of conduct of the first test.

9.6 The students who absent himself/herself for first test in a subject on genuine reasons shall be permitted on the recommendation of the course teacher / Research Supervisor and Head of the Department concerned. Missing examination should be completed within 15 working days from the date of respective examination on payment of missing examination fee prescribed by the university.

10. RESEARCH ADVISORY COMMITTEE

10.1 Each Ph.D. scholar shall have a Research Advisory Committee (RAC) to guide the scholar in carrying out his/her programme.

10.2 A Research Advisory Committee shall be constituted with the approval of the University for each candidate separately, immediately after his/her admission. The purpose of the RAC is to provide expert opinion on frontline research.

10.3 There shall be a Research Advisory Committee for every student consisting of not fewer than four members with the Supervisor as Chairperson. The Research Advisory Committee should have representatives from the major and minor fields. The Research Supervisor should convene a meeting of the Research Advisory Committee at least once in a semester. The research credit evaluation form should be communicated to the Head of Department and the Director, DARE for information.

10.4 Research Supervisor

10.4.1 Every scholar shall have a Research Supervisor (among the recognized guides), who will be appointed by the Vice-Chancellor on the recommendation of the DRC, Head of the Department and the Dean, Faculty of Agriculture. Research supervisors approved by the Vice-Chancellor only can be the guide for the students.

10.4.2 A teacher having Ph.D. with 5 years of service and PG teaching is eligible for teaching and guiding Ph. D. scholars. A teacher should have a minimum of three years of service before retirement for allotment of doctoral candidates.

10.4.3 The research supervisors who wish to avail leave/lien/deputation beyond a period of six months shall propose a Co-supervisor in the concerned subject for the candidates registered with them and it may be intimated to the University well in advance. The final approval of the proposal rests with the Vice-Chancellor.

10.5 Functions of the RAC:

10.5.1 Discuss, advice and recommend on all matters connected with the scholar's research from admission till the completion of the programme.

10.5.2 Approve the topic of research and the synopsis.

10.5.3 Assess and approve the progress reports of Ph.D. scholars in the prescribed format and to report to the University on the fitness or otherwise of the candidate to proceed with his/her research work for the Ph.D.

10.5.4 If necessary, recommend and approve change of title of dissertation / thesis and change of Research Supervisor.

10.5.5. Conduct the pre-submission presentation (before the submission of synopsis) and to give a certificate to this effect to be submitted along with the synopsis.

10.6 The Research Advisory Committee will meet every semester

10.6.1 To scrutinize the research proposal / progress report submitted by the research scholar.

10.6.2 To assess the conduct of experiments / field work, peruse laboratory notebooks, data recording, analysis, and publication.

10.6.3 To review and endorse the annual progress report of the research scholar.

10.6.4 To approve the synopsis of the thesis.

10.6.4 The Chairperson will convene the Research Advisory Committee meetings with intimation to the Director, DARE through the Head of the Department.

10.7 Changes in RAC

The proposals for changes in the RAC are to be sent to the Director, DARE, through HOD and Dean for approval, if it is keenly felt that such changes are absolutely necessary.

10.8 Change of Research Supervisor

10.8.1 Change of Research Supervisor shall not be permitted as a routine. In exceptional cases, such change may be permitted, if valid reasons are provided by the candidates. The Committee headed by the Vice-Chancellor shall look into the request of the petitioner, if there is any conflict between the scholar and the research supervisor.

10.8.2 The Research Supervisor under whom the scholar has originally registered shall give a "No Objection Certificate" and the new proposed Research Supervisor should give a "Certificate of Willingness" to guide the candidate. The final decision will rest with the University. However, the Vice-Chancellor, on the recommendation of the RAC and Dean's Committee, has the right to assign a new research supervisor to the research scholar.

10.8.3 When the change of Research Supervisor is approved, the candidate shall work for a minimum of one year with the new Research Supervisor, if the topic of his/her research is different under the new supervisor, provided he/she fulfils the attendance requirements.

10.9 The tentative topic with broad outline of the research should be fixed within one year from the date of admission with the recommendations of the RAC. The topic of the thesis should be finalysed in the final RAC meeting before submitting the synopsis.

10.10 Absence of Member during Qualifying / Final Viva-Voce Examination

Under extra-ordinary circumstances if the qualifying / final viva-voce examination to Ph.D. student has to be conducted in the absence of one or two RAC members, permission to conduct the examination by co-opting another member in such contingencies should be obtained from the Director, DARE in advance.

11. EVALUATION OF STUDENT'S PERFORMANCE

All students shall abide by the rules for evaluating the course work under the semester system of education, as prescribed from time to time by the University.

12. EXAMINATIONS

12.1 There will be two examinations *viz.*, first test and final examination. Wherever the course has practical, there will be a final practical examination also.

12.2 The duration of first test will be of one and half an hour and final examinations in theory and practical will be conducted for three hours each.

12.2.1 The first test will be conducted by course teachers during the ninth week of the semester as per the scheme drawn by HOD, evaluate and send the marks obtained by the students to the Director, DARE through HOD within seven working days.

12.2.2 There will be final examination separately for theory and practical which will be conducted by the University. Each final theory and practical examinations will be evaluated by two examiners (one will be the course teacher and another will be among the senior faculty of the Department).

The distribution of marks will be as indicated below:

S. No	Examination	Course with practical	Course without practical	Course without theory
1	First Test	30	30	30
2	Final theory	40	70	-
3	Final practical	30	-	70
	Total	**100**	**100**	**100**

The question paper model and distribution of marks for first test and final theory examinations are as follows:

First Test (30 marks) (1.5 hours duration)

1	Definitions/concepts	5 out of 7	(5 x 1)	5 marks
2.	Short notes	5 out of 7	(5 x 3)	15 marks
3	Essay type	2 out of 3	(2 x 5)	10 marks

Final Theory: Course without practical (70 marks) (3 hours duration)

1.	Short notes	5 out of 7	(5 x 4)	20 marks
2	Essay type	5 out of 7 (Four questions must represent K6 level of Bloom's taxonomy)	(5 x 10)	50 marks

Final Theory: Course with Practical (40 marks) (3 hours duration)

1.	Short notes	5 out of 7	(5 x 2)	10 marks
2	Essay type	5 out of 7	(5 x 6)	30 marks

12.3 Minimum Marks for Pass

12.3.1 The student should secure a minimum of 60 per cent marks separately in the theory and practical and an aggregate of 70 per cent to secure a pass in the subject. Each subject shall carry a maximum of 100 marks for purpose of grading. The grading will be done as grade point, i.e., the percentage of marks earned in a subject is divided by 10. The grade point is expressed on a 10 point scale upto two decimals.

12.3.2 Students who secure marks below 70 per cent in a subject will be awarded 'RA' grade and students without having the required minimum attendance of 80 per cent will not be allowed to write the final examination and they will be awarded 'E' grade. Students who secure 'RA' grade should appear for re-examination in the subsequent semester. If a student secured 'E' grade, he/she has to re-register and attend the course again during the next academic year.

12.4 Minimum GPA Requirement

A Ph. D. student, to continue his/her studies in the University, should maintain certain minimum Average Grade Point prescribed here under:

a) Earn a Grade Point of 7.00 for a pass in each subject.
b) For purpose of continuing as a student in the university, a candidate is required to earn a Grade Point Average of not less than 7.00 at the end of each semester.

12.5 Re-Examination

12.5.1 Re-examination is permitted only for the final theory and practical examinations. The students who secure 'RA' grade are permitted to write the re-examinations as and when conducted with the permission of university.

12.5.2 The re-examination fee as prescribed by university per course is to be paid on or before the prescribed date. A student is permitted to write the final theory and practical

examinations only two times during the course period of three years excluding the regular final examination.

12.5.3 In the event of a student who fails to secure a pass in the two re-examinations permitted, he/she has to re-register for the course along with juniors. The marks secured in first test will be retained and the student should produce the practical record during re-examination. The registration for the re-examination shall be done after first test on the date specified by the Director, DARE. Each registration is considered as an attempt even if the student absents for the examination.

12.6 Return of Valued Answer Papers

12.6.1 The valued answer papers of first test shall be shown to the students after the examination. Discrepancies if any, in awarding marks, the student can approach the teacher concerned immediately for rectification.

12.6.2 The answer paper should be retained with the course teacher for six months and then disposed off. Evaluated final theory papers have to be retained up to six months by the Director, DARE after the conduct of examination and then disposed off.

13. SEMINAR

Seminar is compulsory for all students and each student should register and present two seminars each with 0+1 credits. A student can register only one seminar in a semester and only after successful completion of the first seminar, the student is permitted to register for the second seminar.

13.1 Seminar Topic

13.1.1 The seminar topic should be only from the major field and should not be related to the area of thesis research. The seminar topics are to be assigned to the students by the Research Supervisor in consultation with HOD within three weeks after commencement of the semester.

13.1.2 Under the guidance and supervision of the Research Supervisor of the RAC, the student should prepare a seminar paper containing not less than 50 typed and printed pages with a minimum number of 75 references covering the recent 10 years time after reviewing all the available literature and present the seminar after completion of 80% attendance in the semester in the presence of the HoD, RAC, staff and post-graduate students of the concerned department.

13.1.3 The circular on the presentation of the seminars may be sent to other Departments to enable those interested to attend the same. The Research Supervisor will monitor the progress of the preparation of the seminar and correct the manuscript.

13.1.4 The student will submit two copies of the corrected manuscript to the HOD through Research Supervisor before presentation. The student will incorporate the suggestions and carry out corrections made during the presentation and resubmit three fair copies to the HOD (one to Dept. library, the second to the Research Supervisor and the third for student) within 15 days after presentation.

13.1.5 The performance of the student in the credit seminar will be evaluated and grade point awarded by the HOD along with the RAC for 100 marks. Grade Point may be given based on the following norms

Details	Marks
Coverage of literature	40
Presentation	30
Use of audio-visual aids	10
Capacity to participate in discussion and answer the questions	20
Total	**100**

14. QUALIFYING EXAMINATION

Only those students who successfully complete the qualifying examination will be admitted to candidacy of the degree. The qualifying examination consists of only Viva-voce examination. The qualifying examination should be conducted before fourth week from the commencement of the third semester.

14.1 Minimum requirement for qualifying Viva-voce Examination

The students who have completed all the courses and earned a grade point average of not less than 7.0 will be permitted to appear for the qualifying examination. Students who do not satisfy these requirements shall not be permitted to take up the qualifying examination. The qualifying examination will be conducted after the successful completion of course work.

14.2 Selection of Examiner

A panel of five external examiners for qualifying examinations shall be given by the RAC in consultation with HOD before two months of the date of completion of the student's course work to the Director, DARE. One of them will be appointed as external examiner.

14.3 Qualifying Viva-Voce Examination

14.3.1 The evaluation should cover both the research problem and theoretical background to execute the project. This shall assess the aptitude of the student and suitability of the student for the given research topic.

14.3.2 The RAC shall conduct the qualifying viva-voce examination with one external member, who shall be a specialist in the subject from outside the university.

14.3.3 The Head of the Department will monitor and coordinate the conduct of the qualifying viva. The performance of the candidate will be graded as Satisfactory / Unsatisfactory.

14.4 Communication of Results of Qualifying Examination

The Research Supervisor shall act as chairman for the examination committee and shall be responsible for communicating the results of the examination to the Director, DARE through HOD in the prescribed format.

14.5 Failure /Absence in Qualifying Examination

14.5.1 When a student fails or absents for the qualifying examination, he/she may apply again for permission to appear for re-examination to the Director, DARE with the recommendation of the RAC and Head of the Department.

14.5.2 A student, who applies for re-examination should attend viva-voce. Re-examination shall not take place earlier than one month after the first examination. It will be conducted by the RAC as previously indicated.

14.5.3 If a student fails in the re-examination, further re-examination will be considered on the recommendation of the RAC, HoD and Dean, Faculty of Agriculture. If the student fails in the qualifying examination, he/she is not permitted to register for further research credits in the next semester.

15. THESIS RESEARCH

15.1 Selection of Topic

15.1.1 The thesis research for the Ph.D. degree should be of the nature of a definite contribution to the subject and the results should be of sufficient importance to merit publication. The findings should have some practical utility or should lead to theoretical contribution.

15.1.2 The thesis shall be on a topic falling within the field of the major specialization and shall be the result of the student's own work. A certificate to this effect duly endorsed by the major advisor shall accompany the thesis

15.2 Research Proposal

15.2.1 The research scholars shall present their broad area of research and submit a proposal to the Research Advisory Committee at the end of the first semester.

15.2.2 The research proposal has to be presented by the student in a meeting organized by the Head of the Department to get the opinion / suggestion of the faculties of the Department for improving it. Three copies of the research proposal in the prescribed format should be sent to the Director (DARE) through the Head of the Department for approval.

15.2.3 The distribution of research credit will be as follows:

Semester	Credit Hours
I Semester	0+2
II Semester	0+10
III Semester	0+16
IV Semester	0+16
V Semester	0+16
VI Semester	0+15
Total	**0+75**

15.3 Evaluation of Thesis Research

15.3.1 After assigning the research problem, for each semester, the student has to submit a detailed programme of work to be carried out by him/her during the semester in the prescribed proforma. After scrutiny and approval, a copy of the research programme has to be given to the student for carrying out the work during that semester.

15.3.2 Attendance register must be maintained in the department by HOD for all the students to monitor whether the student has 80% of attendance in research.

15.3.3 The student has to submit his/her research observation note book to the Research Supervisor, who will scrutinize the progress and sign the note book with remarks as frequently as possible. This note book will form the basis for evaluation of research progress.

15.3.4 After completion of 80% attendance for research and on or before the last day of the semester, the research scholars, shall submit Progress Reports in the prescribed format duly endorsed by the Research Advisory Committee to the Director, DARE until they submit their synopsis.

15.3.5 Failure to submit the progress reports shall entail automatic cancellation of registration.

15.3.6 The minutes of the meeting of the Research Advisory Committee along with enclosures will be sent to the Director, DARE.

15.3.7 Candidates who are recipients of fellowships such as JRF/SRF directly from any of the funding agencies/ shall send the progress reports and the utilization certificates in the format prescribed by the respective funding agency through proper channel.

15.3.8 The procedure of evaluating research credits under different situations are explained hereunder.

SITUATION – I

The student has completed the research credits as per the approved programme and awarded **SATISFACTORY** by the RAC. Under the said situation, the student can be permitted to register for fresh research credits in the subsequent semester. If the student is awarded **UNSATISFACTORY**, he/she has to re-register the same block of research credits in the subsequent semester.

SITUATION – II

The student who has not secured the minimum attendance of 80 per cent shall be awarded grade ‘E’. The student has to re-register the same block of research credits for which ‘E’ grade was awarded earlier in the following semester with prior permission. Until the completion of re-registered credits, the student should not be allowed to register for fresh (first time) research credits.

SITUATION – III

The student could not complete the research as per the approved programme of work for reasons beyond his/her control such as,

- Failure of crop
- Non-incidence of pests or disease or lack of such necessary experimental conditions.
- Non-availability of treatment materials like planting materials chemicals, etc.
- Any other impeding / unfavorable situation for satisfying the advisory committee.
- Under the said situations, grade **EE** should be awarded.

In the mark list, it should be mentioned that E grade or EE grade was awarded due to 'lack of attendance' or 'want for favourable experimental conditions'.

SITUATION – IV

When the student fails to complete the work even in the 'second time' registration, the student will be awarded **UNSATISFACTORY** and, in the mark, list the 'second time' should be mentioned.

For the registration of research credits for the third time, permission has to be obtained from the Dean based on the recommendation of the RAC, and HOD.

Permission for registration for the fourth time shall be given only by the University based on the recommendation of the RAC, HOD and Dean, Faculty of Agriculture.

16. SUBMISSION OF THESIS

16.1 The research credits registered in the last semester should be evaluated only at the time of the submission of thesis, by the RAC. Students can submit the thesis at the end of the final semester.

16.2 If a student has completed the thesis before the closure of the final semester, the research supervisor can convene the RAC meeting and take decision on the submission of the thesis, provided the student satisfies 80 per cent attendance requirement.

16.3 The candidate shall be allowed to submit his/her thesis after the completion of stipulated period. A grace period of 90 days may be allowed to submit the thesis after the prescribed duration. If the thesis is not submitted even after the grace period, the student shall pay the tuition fee for the ensuing year.

16.4 If a student is not able to submit the thesis within the grace period, the student has to re-register for the credits in the forthcoming semester. The student who re-registers the credits after availing of the grace period will not be permitted to avail of grace period for the second time. The Head of the Department can sanction the grace period based on the recommendation of advisory committee and a copy of the permission letter along with the receipt for payment of fine should accompany the thesis while submission.

16.5 Three copies of the thesis (in the approved format) shall be submitted together with the submission fee not later than three months after the submission of the synopsis.

16.6 No dues certificates from the Department and Central Libraries, Hostel, Stores, etc. must be submitted with the thesis copies. The Research Supervisor shall forward the thesis copies with the enclosures to the Director, DARE through the HOD and the Dean. A soft copy of the thesis in PDF format as prescribed by Shodhganga, shall also be submitted.

16.7 The Ph.D. scholars have to publish a minimum of two research papers in NAAS rated journals with 5 and above rating (for social science NAAS rated journals with 4 and above rating) / Scopus / Web of Science indexed journals at the time of publication of the papers. The synopsis will be accepted for processing only after showing evidences for publications of two such research papers.

16.8 The soft copy of the thesis shall be checked for plagiarism using Turnitin software. Beyond the percentage of reproduction prescribed by UGC, the thesis will not be accepted for valuation.

16.9 Pre-submission Presentation

16.9.1 The pre-submission presentation of the thesis is a requirement to enrich the scholar and to fine tune his/her research presentation. This presentation shall be conducted before the submission of the synopsis in the presence of the RAC, Supervisor/Co-Supervisor, HoD, Faculty members, Research Scholars and/or P.G. Students.

16.9.2 The scholar shall present the findings. The gathering may suggest ideas / references to be consulted / suggestions to improve the work.

16.9.3 A report on this event along with an attendance sheet shall be forwarded by the Research Supervisor with the endorsement of the RAC and HOD to the Director, DARE.

16.10 Submission of Synopsis

16.10.1 The submission of synopsis may be permitted 3 months before the completion of required duration on successful completion of course work.

16.10.2 The Research Scholar shall submit 3 copies of the synopsis approved by the Research Advisory Committee along with a soft copy to the Director, DARE through the Research Supervisor, the HOD and Dean of the respective Faculty.

16.10.3 Guidelines for the preparation of the synopsis are appended in Appendix I. Name of the candidate and name of the supervisor shall not be mentioned anywhere in the synopsis; enrolment number of the candidate alone shall be given. A model cover page for a synopsis is given in Appendix III.

16.11 Guidelines for Preparation of Thesis

16.11.1 The thesis shall not exceed 250 pages excluding the Bibliography, Appendices, etc. If it exceeds the specified number of pages, the Research Supervisor should write to university with the reasons and get prior approval from the University. The candidate shall pay a penalty for the excess number of pages as decided by the Deans Committee. The thesis should be in A4 size.

16.11.2 The specification for the preparation of the thesis is given in Appendix II. A model cover page for a thesis is given in Appendix IV.

16.11.3 The thesis shall be typed on both sides of the page in order to save paper and postage. The thesis shall contain a Certificate from the guide (Annexure) specifying that the thesis submitted is a record of research work done by the candidate during the period of study under him/her and that the thesis has not previously formed the basis for the award of any Degree, Diploma, Associate ship, Fellowship or similar title.

16.11.4 A statement from the guide indicating the extent to which the thesis represents independent work on the part of the candidate should also be made. (Appendix V)

1. VALUATION OF THE THESIS

17.1 Panel of Examiners

17.1.1 The thesis submitted in partial fulfilment of the Ph.D. degree shall be evaluated by two external experts one from within the country and the other from outside the country appointed by the Vice-Chancellor on the recommendation of the Research Supervisor of the RAC, HOD and Dean.

17.1.2 The external experts shall be chosen from a panel of at least five names of specialists separately from within the country and outside the country in the particular field, suggested by the Research Supervisor.

17.1.3 The external experts shall send their evaluation reports on the thesis directly to the Director, DARE along with the copy of the evaluated thesis. The Director, DARE on receipt of the reports from the two examiners will send them to the concerned Research Supervisor who is the convener of viva-voce board.

17.1.4 The Research Supervisor will send the consolidated report with his remarks to the Director, DARE through the Head of the Department. Based on the satisfactory reports of the evaluation, Viva-voce examination will be arranged.

17.1.5 After a student's thesis for Ph.D. degree is evaluated as indicated above, the thesis shall be finally accepted for the award only after the student satisfactorily completes the final Viva-voce examination.

17.1.6 The Viva-Voce board comprises the student's RAC with the addition of the external examiner who valued the thesis, and the HOD. If the HOD happens to be the Research Supervisor, the Dean, Faculty of Agriculture will nominate a senior member of the staff of the concerned Department as a member.

17.1.7 The candidate is expected to defend the thesis at the Viva-voce examination. The degree shall be awarded on the unanimous recommendation of the Viva-Voce board as **satisfactory** with regard to the thesis and the performance of the student in the final Viva-voce examination.

17.1.8 The recommendation of the Viva-Voce board shall be forwarded to the Director, DARE by the Research Supervisor through HOD and Dean which shall be signed by all members of the committee and the external examiner.

17.1.9 A candidate who is not successful (unsatisfactory) at the Viva–voce examination will be permitted to undergo the Viva-voce examination again within a period of three months

17.2 Revision and Resubmission of Thesis

17.2.1 If an examiner recommends change / further work, the thesis will be referred to the same examiner after compliance for his/her opinion. In case of rejection by any one of the examiners, the thesis will be sent to another examiner and his / her recommendation will be final.

17.2.2 If the thesis is recommended to be revised by one or both examiners, the points of revision will be indicated clearly in the report. The necessary correction should be carried out, and the revised version should be sent to the concerned examiner(s). If the examiner(s) is / are still not satisfied with the revised version, the thesis will be rejected. If the thesis is accepted by the examiners (Evaluation), Viva–Voce examination will be conducted by the viva-voce board.

17.3 Re-registration and Submission of Thesis

The minimum of 80% attendance requirement for submitting the thesis after re-registration need not be insisted for those students who have fulfilled the minimum academic and residential requirement of three years.

17.4 Extension of Time

17.4.1 Research scholars who do not submit the thesis within the stipulated period should apply for extension of time three months before the completion of three years. Extension of time and the fees to be paid will be considered by the Deans Committee, if the extension is duly recommended by the RAC, Head of the Department, and the Dean of the Faculty, such candidates will be eligible for extension of time for a maximum period of three years.

17.4.2 The scholar will have to enrol as fresh candidates if he/she fails to submit the thesis within the maximum extension period of three years when granted.

17.4.3 If a scholar requires a few more months after the expiry of the maximum extension period of three years for the submission of the thesis as per the evaluation of the RAC, duly recommended by the Head of the Department and the Dean of the Faculty, as an exceptional case, the Deans committee may consider for re-registration to enable the scholar to submit the thesis. In any case, the time granted shall not exceed six / twelve months.

17.5.1 Number of Chances

17.5.1 A candidate will not be permitted to submit a thesis for the degree on more than two occasions. However, it will be open to the Syndicate, if the Board of Examiners so recommend, to permit the candidate to submit a thesis on a third occasion.

17.5.2 Also, he / she will not be permitted to appear for the viva-voce examination on more than two occasions.

18. DISCONTINUANCE AND READMISSION

18.1 Students admitted to the Ph.D. degree who discontinue their studies before completing the degree with written permission from the university may be re-admitted to the degree programme, provided that the student should have completed the course work before such discontinuance. However, the period of such discontinuance should not exceed five years for Ph.D. Degree from date of admission.

18.2 After completion of course work and qualifying examination, a student is eligible to discontinue temporarily his research program only once within 5 years for Ph. D. program. If the discontinuation period exceeds two semesters, the student has to forego the research credits already registered and register afresh with revised program.

18.3 In the case of field experiments or laboratory experiments in which continuity is essential for research and if a student temporarily discontinues in the middle without completing the experiments, then the entire experiment should be repeated, even if the discontinuation period does not exceed two semesters.

18.4 A student joining the studies, after discontinuation should pay the fees of the existing semester.

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SEMESTER WISE DISTRIBUTION OF CREDIT

Semester	Major Course	Minor Course	Supporting Course	Seminar	Research	Total credit	Non credit Compulsory course
I	6	3	2	1	2	**14**	-
II	6	3	3	1	10	**23**	-
III	-	-	-	-	16	**16**	Research and Publication Ethics
IV	-	-	-	-	16	**16**	**MOOC**
V	-	-	-	-	16	**16**	-
VI	-	-	-	-	15	**15**	-
Total credit	**12**	**6**	**5**	**2**	**75**	**100**	-

DISTRIBUION PATTERN OF COURSES AND CREDIT

Course Code	Course Title	Credit Hours
	Major Courses (Any four out of six major courses)	
EXT 601	Policy Engagement and Extension	3(2+1)
EXT 602	Methodologies for Social and Behavioural Research	3(2+1)
EXT 603	Technology Commercialization And Incubation	3(2+1)
EXT 604	Educational Technology and Instructional Design	3(2+1)
EXT 608	Trends in E-extension for Agricultural Development (2+1)	3(2+1)
EXT 609	Advanced Management Techniques	3(2+1)
	Minor Courses (Any two out of three minor courses)	
EXT 605	Risk Management and Climate Change Adaptation	3(2+1)
EXT 606	Livelihood Development	3(2+1)
EXT 607	Facilitation for People-Centric Development	3(2+1)
	Supporting courses	
STA 602	Multivariate Statistical Methods for Extension Research	3 (2+1)
COM 601	Advances in Computer Applications	2 (1+1)
	Seminar	
EXT 691	Doctoral Seminar – I	1(1+0)
EXT 692	Doctoral Seminar – II	1 (1 +0)
	Research	
EXT 699	Doctoral Research	75 (0+75)
	Non-credit compulsory course	
NGC 611	Research and Publication Ethics – **Contact hours: 2**	2(2+0)
NGC 612	**MOOC – Contact hours: 2**	2(2+0)

Programme Outcomes (POs)

PO1: Update their knowledge on the issues and advances related to agricultural extension and become successful extensions workers on TOT projects.

PO2: Acquire managerial skills and communication skills for organizations and to become excellent mangers.

PO3: Carryout independent field level research by applying various research techniques and following ethical procedures.

PO4: Gain expertise on the advanced training technology and media management and to become successful trainers at various training institutes.

PO5: Gain an overall insight on planning and developing agri based enterprises.

PO and CO Mapping Matrix

AFFINITY LEVELS	
1	Low
2	Moderate/ Medium
3	Substantial /High

EXT 601 POLICY ENGAGEMENT AND EXTENSION (2+1)

Objective

1. To understand the concept of policy and policy advocacy
2. To orient students on the importance of policies in shaping extension's performance.
3. To discuss ways of generating policy relevant evidence to influence policies.
4. To develop capacities to engage with policy actors and the policy development process.
5. To train the students on extension policy development at national level

THEORY

Unit I: Understanding Policy

Why policies are important for extension? Role in providing structure, ensure funding and framework for providing functions-examples; Policy: definitions and types: Is policy a product or a process or both? Policies and institutions-How these influence defining organisational roles and performance in extension organizations-Role of policies in up scaling knowledge-Role of extension in influencing policies to enable innovation.

Unit II: Policy Advocacy and Tools and Policy Analysis

Definition of advocacy, Approaches to policy advocacy-Advising, Media campaigning, Lobbying, Activism, Information Education Communication (IEC) and Behavior Change Communication (BCC); Advocacy for Rural Advisory Services (RAS); Policy advocacy strategy. Explain the meaning and use of policy analysis in decision- making; Describe different types of policy analysis- empirical, evaluative or normative policy analysis, retrospective/ prospective policy analysis, predictive / prescriptive / descriptive policy analysis; How to do policy analysis? - understand the process of policy analysis, highlight the different methods and techniques used in policy analysis, doing ethical policy analysis; Tools for policy impact- research tools, context assessment tools, communication tools, policy influence tools

Unit III: Policy Development Process

Policy development process: Who drives policy change?: National Governments, Donors, Civil Society-varied experiences: Understanding the environment and key actors in policy space- problem identification-policy adoption, implementation and evaluation; stakeholder mapping, identifying opportunities and barriers, mobilising financial resources; Dealing with policy incoherence: identifying contradictions and challenges in policy implementation

Unit IV: Influencing Policy Change

Generating evidence: Role of policy research; analyzing the usefulness and appropriateness of the evidence; Using evidence in policy advocacy; Understanding your audience: analyzing channels of influence; creating alliances; identifying policy champions; Defining goals and objectives; Developing advocacy messages: Policy papers, Policy briefs, good practice notes, *etc*.: Good practices in influencing policies Organising policy dialogues: Policy engagement strategy-Engaging with policy makers: GO and NGO experiences; Policy working groups; advisory panels; use of committees: Use of media including ICTs and social media for influencing policies.

Unit V: Global Experience with Extension Policy

Extension policy in different countries: Explicit extension policy Vs extension as part of Agriculture Policy, Challenges in policy implementation: lack of capacities, financial resources, ownership, lack of stakeholder consultations: Strengthening capacities in extension to influence policies: Global Forum for Rural Advisory Services (GFRAS)'s efforts in

strengthening extension policy advocacy: policy compendium, training modules, training for strengthening capacities to influence policies and current stream of thoughts.

PRACTICALS

Analysing the national and state level agricultural extension policy intentions for strengthening EAS and to study the policy development and policy implementation process in other countries. To explore how different stakeholders influence policies and what mechanisms and tools they use. Identifying the policy level bottlenecks that constrain the effective EAS delivery at district level.

LECTURE SCHEDULE

1. Policy – Definitions and types
2. Policy - A product or a process or both
3. Role of policy in providing structure, ensure funding and framework for providing functions- Examples
4. Policies and institutions - Influence in defining organizational roles and performance in extension organizations
5. Role of policies in upscaling knowledge - Role of extension in influencing policies to enable Innovation
6. Advocacy – Definition and Approaches to policy advocacy - Advising, Media campaigning, Lobbying and Activism
7. Approaches to policy advocacy - Information Education Communication (IEC) and Behavior Change Communication (BCC)
8. Advocacy for Rural Advisory Services (RAS)
9. Policy advocacy strategies
10. Policy Analysis – Meaning and use of policy analysis in decision- making
11. Types of policy analysis- empirical, evaluative or normative policy analysis
12. Types of policy analysis - retrospective/ prospective policy analysis, predictive/prescriptive/ descriptive policy analysis
13. Process of policy analysis – different methods and techniques
14. Ethics in policy analysis
15. Tools for policy impact- research tools, context assessment tools,
16. Tools for policy impact - communication tools, policy influence tools
17. **First Test**
18. Policy development process: National Governments, Donors, Civil Society-varied Experiences
19. Understanding the environment and key actors in policy space- problem identification-policy adoption, implementation and evaluation
20. Understanding the environment and key actors in policy space- stakeholder mapping, identifying opportunities and barriers, mobilising financial resources
21. Dealing with policy incoherence: identifying contradictions and challenges in policy Implementation
22. Generating evidence to influence policy change: Role of policy research
23. Analyzing the usefulness and appropriateness of the evidence and using in policy advocacy
24. Understanding your audience: analyzing channels of influence, creating alliances, identifying policy champions and defining goals and objectives
25. Developing advocacy messages: Policy papers, Policy briefs, good practice notes

26. Good practices in influencing policies: Organising policy dialogues and policy engagement Strategy
27. Engaging with policy makers: GO and NGO experiences, Policy working groups and advisory panels
28. Use of media including ICTs and social media for influencing policies.
29. Extension policy in different countries
30. Explicit extension policy vs extension as part of Agriculture Policy
31. Challenges in policy implementation: lack of capacities, financial resources, ownership, lack of stakeholder consultations
32. Strengthening capacities in extension to influence policies: Global Forum for Rural Advisory Services (GFRAS)
33. Efforts of (GFRAS)'s in strengthening extension policy advocacy: policy compendium, training modules
34. Training for strengthening capacities to influence policies and current stream of thoughts

PRACTICAL SCHEDULE

1. Analysis of country and state level agricultural extension policy to understand the policy intentions from strengthening Extension Advisory Services (EAS).
2. Analysis of extension policy of other countries: policy intentions, processes adopted in development of the policy and mechanisms of policy implementation
3. Visit to interview key policy actors in EAS arena at the state/national level – Joint Director of Agriculture/ Assistant Director of Agriculture, to explore policy level challenges in EAS
4. Visit to interview key policy actors in EAS arena at the state/national level - Directorate of Extension Education (DEE) in TNAU, to explore policy level challenges in EAS
5. Visit to interview key policy actors in EAS arena at the state/national level – Directorate of Agri-Business Development (DABD) in TNAU, to explore policy level challenges in EAS
6. Visit to interview key policy actors in EAS arena at the state/national level – Directorate of Planning and Monitoring (DPM), TNAU to explore policy level challenges in EAS
7. Identify the evidence policy makers look for from extension research
8. Develop reports and briefs on the evidence identified
9. Develop a policy plan, suggesting ways to improve the evidence identified
10. Visit to an NGO and explore how different stakeholders influence policies and identify the Mechanisms
11. Visit to a private sector (Rasi Seeds, Coimbatore) and explore how different stakeholders influence policies and identify the mechanisms and tools used in policy advocacy
12. Visit to a public sector (Aavin Milk Office, Coimbatore) and explore how different stakeholders influence policies and identify the mechanisms and tools used in policy advocacy
13. Visit to KVK and identify policy level bottlenecks that constrain effective EAS delivery and issues around linkages between KVK
14. Visit to Joint Director of Agriculture office and identify policy level bottlenecks that

constrain effective EAS delivery and issues around linkages between them

15. Visit to various inter-departmental collaboration (ATMA) in Joint Director of Agriculture Office and identify policy level bottlenecks that constrain effective EAS delivery and issues around linkages between them
16. Visit to a public private partnership (Syngenta India Limited- Agriculture Seed Store, Coimbatore) and identify policy level bottlenecks that constrain effective EAS delivery and issues around linkages between them
17. **Final practical examination**

COURSE OUTCOMES

1. Gain knowledge on policies in shaping performance of extension and to generate for communicating policy relevant evidences at national level.
2. Enhances skill on extension policy development process.
3. Improve ability to understand various tools and techniques involved in policy advocacy
4. Exposure on various policy frame work procedure followed in various organization
5. Gain skill on formulation of extension training policy.

CO-PO MAPPING MATRIX

	PO 1	PO2	PO3	PO4	PO5
CO1	2	2	1	0	0
CO2	-	2	-	-	3
CO3	-	-	2	-	-
CO4	-	1	-	3	-
CO5	1	-	-	-	-

REFERENCES

1. AEPF. 2015. Report on the Policy Forum by Ghana Directorate of Agricultural Extension Services, Ministry of Food and Agriculture; Modernizing Extension and Advisory Services and Agriculture Policy Support Project, Ghana.
2. Amosa, MDU. 2018. Policy Analysis and Engagement Toolkit. A guide for Pacific Non- government Organizations in the Fisheries Sector.
3. Anonymous. N.d. Policy analysis.
4. Bardach E. A Practical Guide for Policy Analysis The Eightfold Path to More Effective Problem Solving Fourth Edition. Sage Publications. CQ Press.
5. Cairney P. 2015.Chapter 2: Policymaking in the UK: What is Policy and How is it Made? Policy and Policymaking in the UK.
6. CRISP, MANAGE and ICAR-ATARI.2016. Training cum workshop on Strengthening Extension Policy Interface at MANAGE on 9-11th Nov, 2016 in collaboration with the CRISP & ICAR- ATARI, Bangalore.

7. DAC. 2000. Policy Frame Work For Agricultural Extension. Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India.
8. DAFF.n.d. National Policy on Extension and Advisory Services for Agriculture, Forestry and Fisheries. Department of Agriculture, Forestry and Fisheries, Republic of South Africa.
9. Douglas JA.1984.Why policy analysis and ethics are incompatible. Journal of Policy Analysis and Management.
10. Suresh C. Babu and P.K Joshi, 2019. Agricultural Extension Reforms in South Asia-Status, Challenges and Policy Options, Academic Press, New Delhi.

E-RESOURCES

1. http://www.g-fras.org/en/knowledge/documents/category/18
2. http://d2ouvy59p0dg6k.cloudfront.net/downloads/policy_analysis_toolkit_quality.pdf
3. http://www.egyankosh.ac.in/bitstream/123456789/25760/1/Unit-19.pdf
4. https://web.csulb.edu/~msaintg/ppa670/670steps.html
5. http://dlib.scu.ac.ir/bitstream/Ebook/32773/2/9781608718429.pdf
6. https://paulcairney.files.wordpress.com/2013/08/chapter-2-20-8-13-cairney-policy-policymaking-uk.pdf
7. http://crispindia.org/index.php/events/
8. https://sameti.org/Policy%20Framework%20for%20Agricultural%20Extension.pdf
9. https://www.daff.gov.za/doaDev/topMenu/National%20Policy.pdf
10. https://www.researchgate.net

EXT 602 METHODOLOGIES FOR SOCIAL AND BEHAVIOURAL RESEARCH (2+1)

OBJECTIVES

1. To equip the doctoral students to conduct outcome-oriented social and behavioural science research
2. To develop an understanding on the concept of social and behavioural research.
3. To develop practical knowledge and skill in construction of scale and test.
4. To develop sound field focused extension strategies and models with adequate reliability.
5. To familiarize the students in ethical principles in conducting and reporting research.

THEORY

Unit I: Advanced Method for Improving the Quality of Research Data

Dimensionality, reliability and validity; Threats to data quality - Errors and biases; Errors– Meaning and sources; Types – Sampling error, Non-sampling or measurement error and Processing error – Meaning, causes; Effects of errors and biases on data quality; Bias in behavioural research–Meaning, causes, Types– Respondent and researcher biases; Methods of reducing errors and biases in surveys, questionnaires, personal interviews, focus groups and online methods.

Unit II : Scales, Indexes and Tests

Approaches to measurement and scale development - Classical test theory. Item

response theory; Item test theory – item difficulty and item discrimination; Scale development strategies– deductive and empirical; Attitude scale construction, Stimulus-centred scales–method of equally appearing intervals, paired comparison, Q methodology; Subject-centre scales – The Likert scale and Semantic differential, Steps in constructing a multi-dimensional scale using confirmatory factor analysis; Response scales - Guttman's scalogram analysis; The rasch method; Indexes – Meaning, types, importance; Similarities and differences of indexes with scales, Methods of constructing indexes; Common indexes used in extension. Tests – meaning, types, importance; steps in conducting various tests–knowledge test.

Unit III : Qualitative Research Methods

Qualitative methods – Meaning; Types – Ethnography, Grounded theory, Phenomenology, Ecological psychology, Discourse Analysis; Observational research; Case study research– Sampling and sample size; Data collection methods- In-depth interviews, Focus groups, Direct observation, Record review; Content analysis; Unobtrusive Measures; Projective and semi- projective techniques.

Unit IV : Emerging Approaches in Qualitative Research

Mixed methods research–meaning, purpose, types and applications; Participatory research– Meaning, importance, types, methods and tools and applications; Action research–Meaning, importance, Principles, Types, Steps in conducting action research, application in behavioural sciences. Social Network Analysis – Meaning, importance, types, steps in social network analysis, applications; Advanced methods of measuring perception and beliefs. Multi criteria decision making, analytical hierarchy approach.

Unit V : Publishing Research and Ethics in Extension Research

Research reports–Meaning, types, contents; Research publications – meaning, importance, types; Guidelines for preparing research papers - Peer review process, citation styles; Open access publishing; Publishing in social media. Software in academic writing. Ethics in conducting behavioural research; Human subject research–Meaning, history, and ethical guidelines; Ethical aspects of collecting and using Indigenous knowledge and farmers technologies; Ethical practices in publishing; Plagiarism–meaning, sources, Identifying and correcting plagiarism in a research paper using anti-plagiarism software and current stream of thoughts..

PRACTICALS

Practice in constructing a scale and use of scale in various situations. Reliability and validity of the scales developed, Application of Semi Projective and Projective techniques. Content analysis, case studies. Practicing participatory tools and techniques. Hands on experience on Computer Preparation and Data Collection instruments, review of previous studies.

LECTURE SCHEDULE

1. Dimensionality– Unidimensionality and multidimensionality, Methods of assessing Dimensionality
2. Validity – Content validity, Construct validity, Criterion related validity and Reliability – Split half reliability, Test Retest Reliability, Alternative form reliability
3. Data quality and its threats, Errors–Meaning and sources; Types – Sampling error, Non- sampling or measurement error and Processing error – Meaning, causes

4. Bias in behavioural research–Meaning, causes, Types–Respondent and researcher biases; Effects of errors and biases on data quality
5. Methods of reducing errors and biases in surveys, questionnaires, personal interviews, focus groups and online methods
6. Tests–meaning, types, importance- steps in conducting various tests–knowledge test – Item difficulty index & Item discrimination
7. Classical test theory and Item Response Theory
8. Scale development strategies – Deductive and empirical- Scale Development Process.
9. Attitude -characteristics, structure and Attitude scale construction, Edwards informal criteria for attitude scale construction
10. Stimulus- centred scales–method of equally appearing intervals, Stimulus- centred scales - paired comparison
11. Person scaling - Q methodology
12. Subject-centre scales – The Likert scale
13. Subject-centre scales - Semantic Differential
14. Steps in constructing a multi-dimensional scale using confirmatory factor analysis
15. Response scales - Guttman's scalogram analysis, The Rasch method
16. Advanced methods of measuring perception and beliefs
17. **First Test**
18. Indexes - Meaning, types, importance; Similarities and differences of indexes with scales
19. Methods of constructing indexes; Common indexes used in extension
20. Research – Characteristics, Types and methods
21. Qualitative methods – Meaning; Types – Ethnography, Grounded theory
22. Qualitative methods - Phenomenology, Ecological psychology
23. Qualitative methods - Discourse Analysis; Observational research; Case study research
24. Data collection methods- In-depth interviews, Focus groups, Direct observation, Record review; Content analysis; Unobtrusive Measures; Projective and semi-projective techniques
25. Mixed methods research–meaning, purpose, types and applications
26. Participatory research–Meaning, importance, types, methods and tools and applications
27. Action research–Meaning, importance, Principles, Types, Steps in conducting action research, application in behavioural sciences
28. Social Network Analysis – Meaning, importance, types, steps in social network analysis, Applications
29. Research reports, Research publications – Types
30. Guidelines for preparing research papers - Peer review process, citation styles; Open access publishing; Publishing in social media
31. Software in academic writing
32. Ethics in conducting behavioural research; Human subject research–Meaning, history, and ethical guidelines
33. Ethical aspects of collecting and using Indigenous knowledge and farmers technologies; Ethical practices in publishing
34. Plagiarism–meaning, sources, Identifying and correcting plagiarism in a research

paper using anti-plagiarism software and current stream of thoughts

PRACTICAL SCHEDULE

1. Practice in constructing knowledge tests.
2. Practice in constructing Attitude scale
3. Practice in constructing Attitude scale – contd.
4. Practice in constructing Attitude scale – contd.
5. Hands-on experience in constructing indexes.
6. Hands-on experience in constructing indexes – contd.
7. Methods of assessing measurement properties of research instruments - dimensionality, reliability and validity
8. Hands-on exercise in minimizing errors and biases
9. Practice in summated scale development using confirmatory factor analysis
10. Practicing and collecting data using participatory tools and techniques, analyzing and interpreting qualitative data – Part I
11. Practicing and collecting data using participatory tools and techniques, analyzing and interpreting qualitative data – Part II
12. Hands-on exercise in writing systematic review using meta-analysis
13. Exposure to action research studies in Extension
14. Practical experience in writing research paper and Practice in detecting and correcting plagiarism using software
15. Hands on exercise using software for qualitative data analysis
16. Practice in detecting and correcting plagiarism using software.
17. **Final practical examination**

COURSE OUTCOME

CO1: The students will acquire knowledge to develop and Standardize attitude scale using different techniques of attitude scale construction.

CO2: They will be able to develop skills of using projected and semi projected techniques, Computer Package analysis and PRO Tools in Extension Research.

CO3: The scholars will develop critical skills in conducting systematic and objective research by using robust methods while minimizing biases and errors.

CO4: To develop and analyse the various concepts of social and behavioural science research.

CO5: This course will equip students to conduct outcome oriented research.

CO-PO MAPPING MATRIX

	PO 1	PO2	PO3	PO4	PO5
CO1	2	2	1	-	0
CO2	-	2	-	-	3
CO3	-	-	2	-	-
CO4	-	1	-	3	-

CO5	1	-	-	-	-

REFERENCES

1. Berg B. 2009.Qualitative Research Methods for the Social Sciences. Boston: Allyn & Bacon.
2. Furr, R. M. 2011. Scale construction and psychometrics for social and personality psychology. Los Angeles: SAGE Pub.
3. Malhotra, N K. 2010. Marketing research: An applied orientation. Sixth Edition. Upper Saddle River, N J: Prentice Hall Pub.
4. Mulay, Sumathi and Sabarathinam, V.E. 1980. Research Methods in Extension Education. New Delhi: Mansayan Publications
5. Burns, R.B.2000. Introduction to Research Methods. New Delhi: Sage Publications.
6. Kothari, C.R. 2000. Research Methodology Methods& Techniques, 2nd Edition, New Delhi: WishvaPrakasamPublications
7. Kerlinger, N. Fred.2002.Foundations of Behavioral Research. New Delhi: Surjeet Publications.
8. Sandhu, A.M. and Singh, A. 2002. Research Methodology in Social Science. Calcutta: Himalaya Publications House.
9. Singh, AK. 2015. Tests, measurements and research methods in behavioural sciences. New Delhi: BharatiBhawan Publications.
10. Ray, G.L. and Mandal, .S. 2016. Research Methods in Social Sciences and Extension Education. Calcatta: Naya Prakash Publications.

E-RESOURCES

1. http://www.aesanetwork.org/wp-content/uploads/2018/07/6.pdf
2. http://www.socialresearchmethods.net/
3. http://www.ebookpdf.net/
4. http://www.swayam.gov.in/
5. http://www.sciencedirect.com
6. https://bbamantra.com/research-methodology.
7. www.scribed.com/doc/185378498/Research-Methodology-Full-Notes.
8. www.academia.edu/3683300/Research-Methodology-Full-Notes.
9. https://www.edu.ng.aem772.statisticsandresearchmethodsinextn.
10. https://agris.fao.org

EXT 603 TECHNOLOGY COMMERCIALIZATION AND INCUBATION (2+1)

OBJECTIVES

1. To understand the concept of technology Commercialization and Incubation.
2. To improve knowledge on technology development, transfer and commercialization process with entrepreneurship development.
3. To realize the value of agricultural technologies developed at the research establishments by maximizing their utility to stake holders.

4. To create awareness of protecting and commercializing the Intellectual Property Resources (IPR) in the free market economy.
5. To gain knowledge about the organic relationship between protection and commercialization IPR, and entrepreneurship development.

THEORY

Unit I: Technology Commercialization and the Modern Context

Basics of technology commercialization Technology - Definition, functions, process of technological advancement – invention, discovery, innovation and technology; types of innovation - Basic research, Breakthrough innovation, Disruptive Innovation and Sustaining Innovation; Technology transfer and commercialization - **Nature of Agricultural Technology-** Agricultural technology – meaning, types; technology generation system; technology life cycle - **Basics of Technology transfer and commercialization -** Technology transfer Vs Commercialization; Technology commercialization process – elements, models, systems and processes; Technology transfer model – research, disclosure, development and commercialization.

Unit II: Intellectual Property Resources (IPR) Management

Overview of Intellectual Property Resources - Introduction to IPR; Overview & Importance; Genesis; IPR in India and IPR abroad; Patents, copyrights, trademarks & trade secrets, geographical indication, industrial design; Emergence of IPR Regimes and Governance Frameworks - Trade-Related Aspects of Intellectual Property Rights (TRIPS), Convention on Biological Diversity (CBD), Cartagena Protocol, International Union for Protection of New Plant Varieties (UPOV), and BIMSTEC. **- Systems for Protecting IP -** IPR protection laws and systems – National IPR Policy; and IPR laws; procedures for filing IP protection; Systems of IP protection and management in agricultural universities and research institutions and also by stakeholders **-Management of IPR -** Mechanisms of IPR Management – Institutional arrangement, IP Management processes – invention disclosure; IP portfolio management; Infringement management.

Unit III: Protection and Management of Biological Resources

Introduction; National Biodiversity Act (2002); Protection of Plant Varieties and Farmers Rights Act (2001); Guidelines for registration and transfer of biological resources; Farmers rights; Mechanisms of documenting/ collecting, protecting and commercialising farmers varieties and other biological resources; National Biodiversity Authority, PPVFRA and other agencies involved in management of biological resources in India. Access to Genetic Resources and Sharing of Benefits - **Protection, Management and Commercialisation of Grass root and Farmers Innovations, Traditional and Indigenous Knowledge -** Traditional and Indigenous Knowledge, Grassroot and Farmers Innovations – Meaning, forms and importance; Systems of documentation, registration, protection and commercialisation. Documentation of traditional indigenous knowledge -Traditional Knowledge Digital Library (TKDL), Community Biodiversity Registers (CBRs), People's Biodiversity Registers (PBRs), Plant Biodiversity Register, and Honeybee Network. - **Geographical Indications (GI) and Appellation of Origin -** Geographical indications and appellation of origin – meaning, origin; Geographical Indications of Goods (Registration and Protection) Act (1999); Documentation, registration and commercialization of GI protected materials and processes. - **Genetically Modified Organisms (GMO), Agriculture and Biosafety** - The Global Concerns on Use of Genetically Modified Organisms in Food and Agriculture; The Cartagena Protocol on Bio-safety; Regulation of GMO in India -Recombinant

DNA Advisory Committee (RDAC), Institutional Bio-safety Committee (IBSC), Review Committee on Genetic Manipulation (RCGM), Genetic Engineering Approval Committee (GEAC), State Bio-safety Coordination Committee (SBCC) and District Level Committee (DLC). Laws and Acts for regulation of GMO -Guidelines for Research in Transgenic Plants, 1998; Seed Policy, 2002; Plant Quarantine Order, 2003; Regulation for Import of GM Products Under Foreign Trade Policy, 2006; National Environment Policy, 2006.

Unit IV: Technology Commercialization

Technology Assessment and Refinement - Meaning; Importance; Approaches and methods of assessment and refinement of various technologies – stakeholder oriented approaches including participatory technology assessment and refinement; assessment and refinement of traditional and indigenous knowledge and grass root innovations. **- Technology Valuation -** Returns to investment; IP Valuation-Oxford context, IP Valuation methods - Cost approach; Income approach - Discounted Cash Flow, Risk-Adjusted Net Present Value, Net Present Value with Monte Carlo Simulation and Real Options Theory; Market approach - Industry Standards Method, Rating/Ranking Method, Rules of Thumb Approach and Auction Method; Hybrid approaches; Royalty rate method **- Technology Commercialisation Strategies -** Meaning- approaches for technology commercialization – technology scaling up, technology licensing, handholding, agripreneur development, technology business incubation - **Scaling up of Technologies -** Meaning, types and stages of technology scaling up; mechanisms - **Technology Licensing -** Meaning and types - Procedures of licensing, preparing licensing documents; Management of technology licensing process - **Technology Takers and Entrepreneurship -** Meaning; types of technology takers; Technology Taking as a Strategy; Types of entrepreneurship – agripreneurs, startups, small businesses, Producer Organizations, Self Help Groups, Clusters and other forms of entrepreneurship **- Policy support for Technology Commercialisation and Entrepreneurship Development -** Policy support for entrepreneurship development in India - National Policy on Skill Development and Entrepreneurship and other polices; Government of India Support for Innovation and Entrepreneurship – Startup India, Make in India, Digital India, Atal Innovation Mission and others; Entrepreneurship policy and schemes at different states of India; Organizations promoting entrepreneurship in India.

Unit V: Technology Incubation

Basics of Technology Incubation - Meaning, functions and types; stakeholder oriented ncubation process – Livelihood incubation, village incubators **- Technology Incubation in India -** System of technology incubation- incubation process; its effectiveness; Managing profit oriented and non-profit incubators; Schemes for promoting incubators in India **- Technology Promotion And Essential Skills For Technology Commercialization - Technology Promotion -** Technology promotion – meaning, types, business meetings, scientist-industry/ entrepreneur meets, technology conclave, business plan competition, farmers fairs, technology shows **- Dealing with Entrepreneurs, Agripreneurs and Other Stakeholders -** Business communication; Business Etiquette; business networking - **Emerging Approaches in Technology Commercialisation and Incubation - Technology Scouting -** Technology Scouting and Innovations in technology incubation and current stream of thoughts..

PRACTICALS

Practice on technology commercialization process and studying the IPR protection practices for drafting the IPR application; Exposure on plant protection institutes for studying the protection of biological resources; Documentation of the traditional and indigenous knowledge by the way of field experiences.

LECTURE SCHEDULE

1. Technology - Definition, functions, process of technological advancement – invention, discovery, innovation and technology.
2. Types of innovation - Basic research, Breakthrough innovation, Disruptive Innovation and Sustaining Innovation; Technology transfer and commercialization
3. Agricultural technology – meaning, types; technology generation system; technology life cycle
4. Technology transfer Vs Commercialisation; Technology commercialization process – elements, models, systems and processes
5. Technology transfer model – research, disclosure, development and commercialization
6. Introduction to IPR; Overview & Importance; Genesis; IPR in India and IPR abroad; Patents, copyrights, trademarks & trade secrets, geographical indication, industrial design.
7. Emergence of IPR Regimes and Governance Frameworks - Trade-Related Aspects of Intellectual Property Rights (TRIPS), Convention on Biological Diversity (CBD), Cartagena Protocol, International Union for Protection of New Plant Varieties (UPOV), and BIMSTEC.
8. IPR protection laws and systems – National IPR Policy; and IPR laws; procedures for filing IP protection
9. Systems of IP protection and management in agricultural universities and research institutions and also by stakeholders
10. Mechanisms of IPR Management – Institutional arrangement, IP Management processes – invention disclosure; IP portfolio management; Infringement management
11. Introduction; National Biodiversity Act (2002); Protection of Plant Varieties and Farmers Rights Act (2001); Guidelines for registration and transfer of biological resources; Farmers rights
12. Mechanisms of documenting/ collecting, protecting and commercializing farmers varieties and other biological resources; National Biodiversity Authority, PPVFRA and other agencies involved in management of biological resources in India. Access to Genetic Resources and Sharing of Benefits
13. Traditional and Indigenous Knowledge, Grassroot and Farmers Innovations –Meaning, forms and importance; Systems of documentation, registration, protection and commercialization
14. Documentation of traditional indigenous knowledge -Traditional Knowledge Digital Library (TKDL), Community Biodiversity Registers (CBRs), People's Biodiversity Registers (PBRs), Plant Biodiversity Register, and Honeybee Network.
15. Geographical indications and appellation of origin – meaning, origin; Geographical Indications of Goods (Registration and Protection) Act (1999)
16. Documentation, registration and commercialization of GI protected materials and processes.
17. **First Test**

18. The Global Concerns on Use of Genetically Modified Organisms in Food and Agriculture; The Cartagena Protocol on Bio-safety.
19. Regulation of GMO in India -Recombinant DNA Advisory Committee (RDAC), Institutional Bio-safety Committee (IBSC), Review Committee on Genetic Manipulation (RCGM), Genetic Engineering Approval Committee (GEAC), State Bio-safety Coordination Committee (SBCC) and District Level Committee (DLC).
20. Laws and Acts for regulation of GMO -Guidelines for Research in Transgenic Plants, 1998; Seed Policy, 2002; Plant Quarantine Order, 2003; Regulation for Import of GM Products Under Foreign Trade Policy, 2006; National Environment Policy, 2006
21. Technology Assessment and Refinement -Meaning; Importance; Approaches and methods of assessment and refinement of various technologies.
22. Stakeholder oriented approaches including participatory technology assessment and refinement; assessment and refinement of traditional and indigenous knowledge and grass root innovations.
23. Returns to investment; IP Valuation-Oxford context, IP Valuation methods - Cost approach; Income approach.
24. Discounted Cash Flow, Risk-Adjusted Net Present Value, Net Present Value with Monte Carlo Simulation and Real Options Theory; Market approach
25. Industry Standards Method, Rating/Ranking Method, Rules of Thumb Approach and Auction Method; Hybrid approaches; Royalty rate method
26. Technology Commercialisation Strategies - Meaning- approaches for technology commercialization – technology scaling up, technology licensing, handholding, agripreneur development, technology business incubation
27. Scaling up of Technologies - Meaning, types and stages of technology scaling up; mechanisms - Technology Licensing - Meaning and types - Procedures of licensing, preparing licensing documents; Management of technology licensing process
28. Technology Takers and Entrepreneurship - Meaning; types of technology takers; Technology Taking as a Strategy; Types of entrepreneurship – agripreneurs, startups, small businesses, Producer Organizations, Self Help Groups, Clusters and other forms of entrepreneurship
29. Policy support for entrepreneurship development in India - National Policy on Skill Development and Entrepreneurship and other polices; Government of India Support for Innovation and Entrepreneurship.
30. Startup India, Make in India, Digital India, Atal Innovation Mission and others; Entrepreneurship policy and schemes at different states of India; Organizations promoting entrepreneurship in India.
31. Basics of Technology Incubation - Meaning, functions and types; stakeholder - oriented incubation process – Livelihood incubation, village incubators.
32. Technology Incubation in India - System of technology incubation- incubation process; its effectiveness; Managing profit oriented and non-profit incubators; Schemes for promoting incubators in India
33. Technology promotion – meaning, types, business meetings, scientist-industry/ entrepreneur meets, technology conclave, business plan competition, farmers fairs, technology shows
34. Dealing with Entrepreneurs, Agripreneurs and Other Stakeholders - Business communication; Business Etiquette; business networking - Technology Scouting and Innovations in technology incubation and current stream of thoughts.

PRACTICAL SCHEDULE

1. Understanding the technology commercialization process – Visit to Technology Commercialisation Unit of ICAR Institute/ Agricultural University.
2. Understanding the IPR protection practices – Visit to Patent Attorney office
3. Hands-on experience in drafting IPR application – Patent/Copyright/ Trademark
4. Understanding protection of biological resources including plant varieties – Visit to PPVFRA Branch office/ ICAR Institute or Agricultural University involved in plant variety protection
5. Documenting Traditional and indigenous knowledge – Field experience in using various protocols of using traditional and indigenous knowledge
6. Protecting unique local goods through Geographical Indications – Hands on experiences in documenting and registering Geographical indications
7. Technology assessment/ validation of traditional and indigenous knowledge – QuIK and other methods
8. Hands on experience in technology valuation
9. Hands on experience in technology licensing process including drafting agreements
10. Understanding the Technology Business Incubation – Visit to Agri Business Incubator or Technology Business incubator
11. Hands on experience in planning and organizing technology promotion events
12. Hands on experience in various techniques in business communication and Business etiquette
13. Visit to Agri trade fair/ exhibition to know the product availability and marketing strategies.
14. Identification on successful entrepreneurial traits
15. Exercise on business plan preparation
16. Hands on experience in Technology Scouting
17. **Final Practical Examination.**

COURSE OUT COMES:

CO1:The students will acquire knowledge on different stake holders in protection and management of their IPR for maximizing their value realization through commercialization.
CO2:The students will acquire knowledge on technology commercialization and incubation.
CO3:The students will acquire skill in intellectual property resource management.
CO4:This course will familiarize the students in genetically modified organisms in agriculture.
CO5:This course will equip the students in systems for protecting IP

CO-PO MAPPING MATRIX

	PO 1	PO2	PO3	PO4	PO5
CO1	2	2	1	-	-
CO2	-	2	-	-	3
CO3	-	-	2	-	-
CO4	-	1	-	3	-
CO5	1	-	-	-	-

REFERENCES:

1. Bandopadhyay, D. 2018. Securing Our Natural Wealth: A Policy Agenda for Sustainable Development in India and for its Neighbouring Countries. Singapore; Springer.
2. Ghosh, S and Joshi A. 2017. Hand book for Non- Profit Incubator Managers. New Delhi: Deutsche Gesellschaft fur International.
3. Gupta AK. 2016. Grassroots Innovation: Minds on the margin are not marginal minds. Gurgaon: Penguin Books.
4. ICAR. 2018. ICAR Guidelines for Intellectual Property Management and Technology Transfer/ Commercialization [Revised in 2018]. Indian Council of Agricultural Research, New Delhi.
5. Pandey N and Dharni K. 2014. Intellectual Property Rights. Delhi. PHI Learning Pvt.Ltd.
6. Sharma G and Kumar H. 2018. Intellectual Property Rights and Informal sector innovations: Exploring grass roots innovations in India. The Journal of World Intellectual Property. 1-17.
7. Stevens AJ. 2016. Intellectual property valuation manual for academic institutions (Report No. CDIP/17/INF/4). Geneva: Committee on Development and Intellectual Property (CDIP).
8. WIPO and ITC. 2010. Exchanging Value – Negotiating Technology Licenses, A Training Manual. World Intellectual Property Organization (WIPO).
9. Nanette Kalis.2016. Technology Commercialization through new company formation, National Business Incubation Association.
10. Sarfraz A. Mian, 2021. Handbook of research on business and technology incubation and acceleration, e-book-Elgaronline.

E – RESOURCES:

1. World Intellectual Property Organization (http://www.wipo.int/portal/intex.html.en)
2. Indian Patent Office (http://www.patentoffice.nic.in/)
3. PPV and FR Authority (http://plantauthority.gov.in/)
4. Journal of Intellectual Property Rights (http://www.niscair.res.in/sciencecommunication/)
5. Technology Incubation Centre – Indian Institute of Technology Guwahati (iitg.ac.in)
6. http://www.sciencedirect.com
7. http://www.researchgate.net
8. http://www.semanticsholar.org
9. http://www.infodev.org
10. http://www.scielo.cl

EXT 604 EDUCATIONAL TECHNOLOGY AND INSTRUCTIONAL DESIGN (2+1)

OBJECTIVES

1. To develop an understanding on the concept of educational technology and instructional design
2. To develop knowledgeable, responsive and effective teachers committed to educating diverse group of learners in a dynamic extension landscape.
3. To understand the concept of technology enabled learning.

4. To expose the students in learning and how it can be integrated into instructional design to create engaging learning experience in both classroom and online learning environment.
5. To prepare the students as competent professionals employable in the extension and RAS providers both as specialised researchers as well as designers.

THEORY

Unit I: Basics of Instructional Design and Educational Technology

Understanding various terms - educational technology, instructional design, instructional systems design, curriculum design, pedagogy, andragogy; Brief overview of the origin and evolution of ET and ID as theory and practice and relavance of ET and ID in extension and rural advisory services Concepts and theories of learning - Behaviorism, Cognitivism, Constructivism and Complex learning theories; instructional designers and learning theories; Types of learning or learning domains- Bloom's taxonomy of the cognitive domain, Krathwohl and Bloom's affective domain and Simpson's psychomotor domain.

Unit II : Technology Enabled Learning

Role of technology in education; Digital media, new tools and technology and its applications in higher agricultural education; Open and distance Learning (ODL); Online Education, eLearning, Massive Open Online Courses – SWAYAM; Quality assurance and certification in e-learning.Open Education Resources (OERs), Course CERA, EduEx, CoL, RLOs; Smart classrooms and Campuses, Web-based remote laboratory (WBRL); types and implications of disruptive technologies for higher education and extension; Augmented learning; Adaptive learning; meaning, features and good practices in using open source Learning Management Systems (Moodle).

Unit III : Instructional Design

Theories and Models of Instruction Howard Gardner's Theory of Multiple Intelligences, David Kolb's Experiential Learning Cycle, Albert Bandura's Social Learning Theory, Rand Spiro's Cognitive Flexibility Theory and Its Application In eLearning, Wlodkowski's Motivational Framework for Culturally Responsive Adult Learning; ADDIE Model, Dick and Carey Model, SAM Model, Bloom's Taxonomy; Overview of planning, designing and implementing the curricula; Needs Analysis of learners- meaning, approaches and steps; Task and content analysis of instruction - meaning, approaches, steps and techniques (topic analysis, procedural analysis, and the critical incident method); Learner analysis – meaning, importance and approaches, relevance of Maslow's Hierarchy of Needs and learning styles, Captive Audience vs. Willing Volunteers, Universal vs. user-centered design, Learner Analysis Procedures; Writing learning objectives: Meaning of Learning Goal and Learning Objectives; ABCDs of well-stated objectives; Setting goals, translating goals into objectives; Contextualising ADDIE process within the Extension learning environment.

Unit IV : Instructional Strategies and Evaluating Instruction

Organizing content and learning activities - scope and sequence of instruction; Posner's levels of organizing (Macro, Micro, Vertical, and Horizontal) and structures of organizing (content vs. media) instruction, Gagne's events of instruction, Edgar Dale's Cone of Experience; Methods of Delivery- classroom teaching, programmed instruction,

synchronous and asynchronous modes of distance education; Changing role of a teacher in classroom and teaching competencies. Evaluating Instruction. Meaning of Assessment, Measurement and Evaluation; Developing learner evaluations and their reliability & validity; assessment techniques for measuring change in knowledge, skill and attitude of learners - Objective Test Items, Constructed-Response Tests, Direct Testing, Performance Ratings, Observations and Anecdotal Records, Rubrics, Portfolios, Surveys and Questionnaires, Self-Reporting Inventories, Interviews; Conducting learner evaluation pre-, during and post-instruction; Formative and Summative Evaluation- meaning, approaches and steps; Evaluating Learner Achievement and the Instructional Design Process;

Evaluating the success of instruction; Performance appraisal of teachers.

Unit V : Trends in Instructional Design

Alternatives to ADDIE model - Rapid prototyping and constructivist ID, reflections on instructional design as science and as an art; Relating ID models and process in extension learning environment; political economy of higher education in developed and developing countries; University assessment and rating methods, returns from agricultural higher education; research in education and instructional design and current stream of thoughts..

PRACTICALS

Formulation of instructional Course Objective. Development and presentation of course outlines. Assessment of learning styles for effective delivery of course content. Designing of e-learning modules for integrating and applying their knowledge and skills. Development of survey instruments for measuring the outcomes and competencies of students and teachers. Visit to virtual / augmented learning labs. Study of research reviews and Presentation of reports.

LECTURE SCHEDULE

1. Concepts of Educational technology, instructional design, instructional systems design, curriculum design, pedagogy, andragogy.
2. Origin and evolution of ET and ID - Relevance of ET and ID in extension and rural advisory Services
3. Concepts and Theories of Learning - Behaviorism, Cognitivism, Constructivism and Complex learning theories
4. Types of learning or learning domains - Bloom's taxonomy of the cognitive domain, Krathwohl and Bloom's affective domain and Simpson's psychomotor domain
5. Technology in education - Digital media, new media tools – Its role and applications in higher agricultural education
6. Open and distance Learning (ODL), Online Education, eLearning
7. MOOCs – SWAYAM, Quality assurance and certification in e-learning
8. Open Education Resources (OERs) - Course CERA, EduEx, CoL, RLOs
9. Smart classrooms and Campuses, Web-based remote laboratory (WBRL)
10. Types and implications of disruptive technologies for higher education and extension
11. Augmented learning; Adaptive learning - meaning, features and good practices in using open source
12. Learning Management Systems (Moodle)
13. Theories of instruction - Howard Gardner's Theory of Multiple Intelligences,

David Kolb's Experiential Learning Cycle, Albert Bandura's Social Learning Theory, Rand Spiro'sCognitive Flexibility

14. Wlodkowski's Motivational Framework for Culturally Responsive Adult Learning and its Applications
15. Models of Instruction - ADDIE Model, Dick and Carey Model, SAM Model, Bloom's Taxonomy
16. Alternatives to ADDIE model - Rapid prototyping and constructivist ID, reflections on instructional design as science and as an art
17. **First Test**
18. Relating ID models and process in extension learning environment
19. Planning, designing and implementing the curricula
20. Need Analysis of learners - meaning, approaches and step
21. Task and content analysis of Instruction - meaning, approaches, steps and techniques (topic analysis, procedural analysis, and the critical incident method)
22. Learner analysis – meaning, importance and approaches, relevance of Maslow's Hierarchy of Needs and learning styles, Captive Audience vs. Willing Volunteers, Universal vs. user-centered design, Learner Analysis Procedures
23. Writing learning objectives: Meaning of Learning Goal and Learning Objectives; ABCDs of well-stated objectives; Setting goals, translating goals into objectives
24. Organizing content and learning activities - scope and sequence of instruction; Posner's levels of organizing (Macro, Micro, Vertical, and Horizontal) and structures of organizing (content vs. media) instruction
25. Gagne's events of instruction, Edgar Dale's Cone of Experience
26. Methods of Delivery of instruction - classroom teaching, programmed instruction, synchronous and asynchronous modes of distance education
27. Changing role of a teacher in classroom and teaching competencies
28. Formative and Summative Evaluation- meaning, approaches and steps
29. Assessment techniques for measuring change in knowledge, skill and attitude of learners - Objective Test Items, Constructed-Response Tests, Direct Testing, Performance Ratings, Observations and Anecdotal Records, Rubrics, Portfolios, Surveys and Questionnaires, Self- Reporting Inventories, Interviews; Conducting learner evaluation pre-, during and post- instruction
30. Developing learner evaluations and their reliability & validity
31. Evaluating Learner Achievement and the Instructional Design Process
32. Evaluating the success of instruction; Performance appraisal of teachers
33. Policies of higher education in developed and developing countries
34. University assessment and rating methods, returns from agricultural higher education; research in education and instructional design and current stream of thoughts.

PRACTICAL SCHEDULE

1. Hands on exercise on assessing learning styles through Barsch and Kolb inventories
2. Exercises on task/content analysis and learner analysis and preparation of report
3. Exercise on instructional design Plan includes learning objectives and corresponding instructional strategies and assessment items
4. Prepare course outline and lesson plan with an appreciation for diverse learning styles based on temperament, gender, and cultural/ethnic differences
5. Deliver a lecture for UG/PG students

6. Development and testing of survey instruments for evaluating learning outcomes/ competencies of students
7. Development and testing of survey instruments for performance appraisal / competency assessment of teachers.
8. Content analysis of e-learning platform
9. Design an online e-learning module on a topic of interest as a capstone project - integrateand apply the knowledge and skills gained from the course for creating an effective learning experience for a target audience
10. Exercise on designing an online course using open source LMS like moodle or EdX
11. Prepare a short review paper on recent theories and models of instructional design
12. Case study on an instructional designer of your choice and prepare a synthesis report about what job roles he/she perform, What ID processes does he or she use, challenges faced
13. Visit to a virtual learning / augmented learning labs
14. Field visit to a distance learning centre with e learning facilities
15. Hands-on exercise with video-editing software, web conferencing and video conferencing solutions
16. Assignment presentation
17. **Final practical examination**

COURSE OUTCOME

1. The students will acquire knowledge on different concepts of learning and education within the context of agricultural development
2. To relate and apply learning theories and models to the development, design and evaluation of courses utilizing educational technology and instructional design.
3. This course will equip the students in classroom and online learning environment.
4. The students will acquire skill in RAS providers both as specialized researchers as well as designers.
5. This course will familiarize the students in some of the methods, tools and techniques to designed educational technology and instructional design.

CO-PO MAPPING MATRIX

	PO 1	**PO2**	**PO3**	**PO4**	**PO5**
CO1	2	2	1	0	0
CO2	-	2	-	-	3
CO3	-	-	2	-	-
CO4	-	1	-	3	-
CO5	1	-	-	-	-

REFERENCES

1. Agarwal JC. 2007. Essentials of Educational Technology Innovations in Teaching – Learning. 2nd Ed. Vikas Publ. House.
2. Allen M. 2013. Leaving ADDIE for SAM: An Agile Model for Developing the Best Learning Experiences, https://www.alleninteractions.com/about.
3. Anonymous. 2000. Contents Pages of the Journal Educational Technology from January, 2OO0 to December, 2O15 Volume 40-Volume 55, http://publicationshare.com/pdfs/ET- Contents-Pages-2000-2015.PDF.
4. Anonymous. 2000. Contents Pages of the Journal Educational Technology from January, 2OO0 to December, 2O15 Volume 40-Volume 55, http://publicationshare.com/pdfs/ET- Contents-Pages-2000-2015.PDF.
5. Bandura A. 1977. Social learning theory. Englewood's Cliffs, NJ: Prentice-Hall.
6. Bandura A. 2001. Social cognitive theory: An agentic perspective. Annual Review of Psychology, 52, 1–26.
7. Spiro R. 2018. *Cognitive Flexibility Theory & the Post-Gutenberg Mind:* Rand Spiro's Home Page,
8. https://postgutenberg.typepad.com/newgutenbergrevolution/?utm_campaign=elearning industry.com&utm_source=%2Fcognitive-flexibility-theory&utm_medium=link
9. Ellen R. 2004. *Instructional Design and Curriculum Development: Deconstructing the Difference,* Educational Technology, Vol. 44, No. 2 (March-April 2004), pp. 3-12. https://www.jstor.org/stable/44428883
10. Gardner H. 2008. *Multiple intelligences: New horizons in theory and practice*. New York, NY: Basic Books.
11. Gayle VDS, Karen LR, Patrick RL. 2018. Web-Based Learning: Design, Implementation and Evaluation, 2nd Edition

E-RESOURCES

1. Commonwealth of Learning - Learning for Sustainable Development (col.org)
2. EcoLearnIT - Reusable Learning Object System (ufl.edu)
3. https://swayam.gov.in/
4. https: //educationaltechnology.net
5. https: //www.instructionaldesigncentral.com
6. https://elearningindustry.com/
7. https://www.instructionaldesigncentral.com
8. http://www.instructionaldesign.org/theorie
9. https://www.isfet.org/course
10. http://www.aesanetwork.org/

EXT 605 RISK MANAGEMENT AND CLIMATE CHANGE ADAPTATION (2+1)

OBJECTIVES

1. To provide both basic and applied knowledge on the subjects of risks management
2. To understand the concept of risk management and climate change adaptation with reference to Indian agriculture.
3. To make the students to understand the subjects from a multidisciplinary perspective - technical, socio-economic, political, financial, and regulatory.

4. To equip students to identify, evaluate and evolve ways to address (mitigate and manage) risks and climate change.
5. To gain knowledge about climate change agriculture and extension advisory services.

THEORY

Unit I: Understanding Risk and Distress

Introduction to risk, risk management, uncertainty, sensitivity and distress, General risk theory, Risk analysis methods, Risk perception and decision making, Indicators of risk and distress in agriculture – identification, selection and assessment, Understanding the agrarian distress in Indian agriculture, Sources of distress in Indian farming -changing farm size, land use, cropping patterns, pricing policy, markets and terms of trade, Typology of crisis in agriculture; Droughts, floods and Indian agriculture, Distress and farmer suicides - causes and socio-economic consequences

Managing Risk and Distress

Ways to reducing/managing risk and distress in Indian agriculture; crop and life insurance; Developing support systems; Planning, implementation and evaluation of risk/distress management programs; Institutional frameworks for risk and disaster management - NDMA & SDMAs; Developing District Agriculture Contingency Plans; Risk management by diversification; Good practices and lessons from other countries; Responses of government, non-government and extension system to agrarian crisis; National Farmers Policy.

Unit II: Extension Professionals and Risk management

Understanding social-psychological and behavioural dimensions of farmers under risk/distress; Risk perception and communication; Helping farmers manage farm level risks - mobilising resources, linking with markets, strengthening capacities; Working with village level risk management committees; Operational skills for preparing contingency and disaster management plans; Institutional and extension innovations in managing risk and distress; Policy and technological preferences for dealing with drought and flood.

Unit III: Introduction to Climate Change Science

Basic concepts of and terms in climate change science; impacts of climate change; anthropogenic drivers of climate change, Climate change and Indian agriculture; climate adaptation vs. disaster risk reduction; anticipated costs of adaptation; climate change and poor; Overview of UNFCCC framework and institutions, Kyoto Protocol and beyond; India's National Action Plan on Climate Change and National Mission on Strategic Knowledge on Climate Change; National Coastal Mission, Institutional arrangements for managing climate change agenda.

Unit IV: Introduction to Climate Change Adaptation and Mitigation

Introduction to Climate Change Adaptation, Conducting a vulnerability assessment (CVI and SEVI frameworks), Identifying and selecting adaptation options; Global, national and state level initiatives and plans to support climate change adaptation, private sector and civil society initiatives and activities; Mainstreaming climate change adaptation into development planning, Financing climate adaptation and budgetary allocations for programmes, Gender and climate change adaptation, Agricultural development programmes and strategies towards climate change adaptation and mitigation, Community based and Ecosystem based adaptation strategies, preparing evidence based intervention plans for vulnerability reduction at micro and macro-levels.

Unit V: Climate Smart Agriculture (CSA) and Extension &Advisory Services

Climate smart agriculture; Developing climate smart and climate resilient villages; Stakeholders and determinants involved in climate smart agriculture; Climate smart agriculture and EAS; Innovative extension approaches used in CSA; Climate information services, Farmers perceptions about climate change; Farm and household level manifestations and adaptation strategies; Barriers and limits to adaptation; Farmers feedback on performance of extension methods; Skills, competencies and tools required for extension professionals at different levels and development departments in up scaling CSA and current stream of thoughts..

LECTURE SCHEDULE

1. Introduction to risk and risk management, uncertainty, sensitivity and distress.
2. Risk theory and analysis methods, perception and decision making, Indicators of risk and distress in agriculture–identification, selection and assessment.
3. Sources of distress in Indian farming- changing farm size, land use, cropping patterns, pricing policy, markets and terms of trade
4. Typology of crisis in agriculture; Distress and farmer suicides –causes and socio-economic consequences, Managing Risk and Distress, Developing support systems
5. Planning, implementation and evaluation of risk /distress management programs
6. Institutional frame works for risk and disaster management -NDMA & SDMAs
7. Developing District Agriculture Contingency Plans
8. Risk management by diversification
9. Good practices and lessons from other countries
10. Understanding social- psychological and behavioral dimensions of farmers under risk / distress
11. Risk perception and communication; Helping farmers manage farm level risks – mobilizing resources, linking with markets, strengthening capacities
12. Working with village level risk management committees; Operational skills for preparing contingency and disaster management plans
13. Institutional and extension innovations in managing risk and distress
14. Policy and technological preferences for dealing with drought and flood; Insurance Policies for adversities in agriculture (PMFBY)
15. Basic concepts and terms in climate change science; Impact of climate change; anthropogenic drivers of climate change
16. Climate change and Indian agriculture; Climate adaptation vs. Disaster risk reduction; Anticipated cost of adaptation; climate change and poor
17. **First Test**
18. Concept and Structure of UNFCCC framework and institutions, Kyoto Protocol and beyond
19. Outline of India's National Action Plan on Climate Change and National Mission on Strategic Knowledge on Climate Change
20. National Coastal Mission, Institutional arrangements for managing climate change agenda
21. Introduction to Climate Change Adaptation, Conducting a vulnerability assessment (CVI and SEVI frameworks)
22. Identifying and selecting adaptation options; Global, national and state level initiatives
23. Plans to support climate change adaptation, private sector and civil society initiatives and activities
24. Mainstreaming climate change adaptation into development planning
25. Financing climate adaptation and budgetary allocations for programme

26. Gender and climate change adaptation; Agricultural development programmes and strategies towards climate change adaptation and mitigation
27. Community based and Ecosystem based adaptation strategies; Preparing evidence-based intervention plans for vulnerability reduction at micro and macro-levels.
28. Introduction to Climate smart agriculture; Developing climate smart and climate resilient villages
29. Stakeholders and determinants involved in climate smart agriculture
30. Climate Smart Agriculture and EAS; Innovative extension approaches used in CSA
31. Climate information services; Farmers' perception about climate change
32. Farm and household level manifestations and adaptation strategies, Barriers to adaptation and limitations
33. Farmers feedback on performance of extension methods
34. Skills, competencies and tools required for extension professionals at different levels and development departments in up scaling CSA and current stream of thoughts.

PRACTICAL SCHEDULE

1. Hands-on practice in using risk assessment/analysis tools
2. Understanding social- psychological and behavioral dimensions of farmers under risk / distress
3. Case studies on risk / distress assessment in agriculture -Indian and global
4. Lessons / Experiences from NICRA Project in agriculture and allied sectors
5. Developing criteria, indicators and indices for assessment of risk, vulnerability and resilience
6. Hands on practice on use of vulnerability and risk assessment tools and techniques
7. Case studies on success stories of climate change adaptation and community based initiatives]
8. Visits to State Disaster Management Authority
9. Developing district and village level intervention plans for climate change adaptation
10. Visit to village to identify the impact of climate change on Agriculture
11. Visit to village to identify the adaptation and mitigation strategies followed by the farmers (Crop-I)
12. Visit to village to identify the adaptation and mitigation strategies followed by the farmers (Crop-II)
13. Visit to JDA/ADA office to understand the CSA advisory services offered to the farmers
14. Case studies on climate smart agriculture / villages from India and world
15. Case studies on impact assessment of crop insurance programs, disaster management programs
16. Capstone project on documenting ITKs and local practices related to reducing risk/ climate resilience agriculture
17. **Final practical examination**

COURSE OUTCOME

1. Students gained knowledge on the scientific foundation of risk management and climate change science and relate the key learning to the job of extension professionals.
2. Students thoroughly exposed to various methods and tools for risk and climate related vulnerability assessments and adaptation strategies in the context of Indian agriculture
3. Develop skills to identify, evaluate and evolve ways to address (mitigate and manage) risks and climate change.

4. Synthesize material in scientific publications relevant for risk management and climate change adaptation and critically reflect on their benefits and limitations for decision making.
5. Gain Practical exposure towards risk management and climate smart agriculture.

CO-PO MAPPING MATRIX

	PO 1	PO2	PO3	PO4	PO5
CO1	2	2	1	-	-
CO2	-	2	-	-	3
CO3	-	-	2	-	-
CO4	-	1	-	3	-
CO5	1	-	-	-	-

REFERENCES

1. Ahamad, J and Alam, D. 2012.Impact of Climate Change on Agriculture and Food Security in India Int. J. of Agril. Env. and Biotech. Vol. 4, No. 2: June 2011: 129-137.
2. A, Hambleton R, and Jose, D. 1997. Introduction to Risk Management. Understanding Agriculture Risk: Production, Marketing, Financial, Legal, Human Resources. Risk Management Agency, USDA. December 1997.
3. Becker P.2014. Sustainability Science: Managing Risk and Resilience for Sustainable Development. Amsterdam and Oxford: Elsevier.
4. Burton ES and Riikka R. 2010. Strengthening Agricultural Extension and Advisory Systems. The International Bank for Reconstruction and Development/The World Bank.
5. Coppola DP. 2011. Introduction to International Disaster Management. (2. ed.). Amsterdam: Elsevier, 2011. Ch 2: Hazards, pp. 37-137; Ch 3: Risk and Vulnerability, pp. 139-207; Ch 4: Mitigation, pp. 209-250; Ch 5: Preparedness, pp. 251-303.
6. Davis K and Sulaiman RV. 2013. Extension Services for Effective Agricultural Risk Management. CRISP. Washington, DC: FARMD.
7. Deepika B, Saravanan R, and Suchiradipta B. 2018.Climate Smart Agriculture towards Triple Win: Adaptation, Mitigation and Food Security. Research Report Brief 5, CAEIRA, MANAGE, Hyderabad, India.
8. GFRAS. 2012. Module 13: Risk Mitigation and Adaptation in Extension and Advisory. Global Forum for Rural Advisory Services.
9. IPCC. 2014. Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland.
10. Singh, NP., Arathy, A, Pavithra. S., Balaji, SJ., Bhawna, A and Arshad, MK. 2017. Mainstreaming Climate Change Adaptation into Development Planning. Policy Paper 32.

ICAR-National Institute of Agricultural Economics and Policy Research (NIAP), New Delhi

11. Solar, R. 2014. Building Climate Resilience: A Training Manual for Community Based Climate Change Adaptation. Regional Climate Change Adaptation Knowledge Platform for Asia, Partner Report Series No. 14. Regional Resource Centre for Asia and the Pacific (RRC.AP), Asian Institute of Technology, Thailand.

E-RESOURCES

1. http://extensionrme.org/pubs/introductiontoriskmanagement.pdf
2. http://siteresources.worldbank.org/INTARD/Resources/Stren_combined_web.pdf
3. http://www.g-fras.org/en/events/gfras-events/annual-meeting-philippines2012/blog/170-climate-change.html
4. http://www.manage.gov.in/publications/reportbrief/MANAGE_Research%20Brief5 Deepa.Pdf
5. http://www.g-fras.org/es/105-english/gfras/events/3rd-gfras-annaul-meeting/158-rasthe-engine-for-farmer-productivity.html
6. http://www.fao.org/3/i9209en/I9209EN.pdf
7. https://www.giz.de/de/downloads/giz2015-en-nama-india-private-financial-institutionsclimate-finance-final-report.pdf
8. http://agricoop.nic.in/agriculture-contingency-plan-listing
9. http://www.moef.nic.in/downloads/home/Pg01-52.pdf
10. https://dst.gov.in/climate-change-programme

EXT 606 LIVELIHOOD DEVELOPMENT (2+1)

OBJECTIVES

1. To develop an understanding on the concept of livelihood and its various forms.
2. To acquaint the students regarding the various alternative approaches that has beenadopted to support livelihoods.
3. To familiarize the students to some of the methods, tools and techniques they can utilize to design livelihood interventions.
4. To expose the students to the context, especially the economic models and policy environment that guides the livelihood choices.
5. To equip students to work in multidisciplinary teams and engage at multiple levels on livelihood issues.

THEORY

Unit I : Understanding of Livelihood

Concept of Livelihoods - Basic concepts and components of livelihood and Development; Livelihood intervention: definition, types-Spatial, segmental, sector–sub-sector; Livelihood Interventions in both Internal and External context, Understanding Rural Livelihoods – Concepts, types and components, Agricultural livelihoods - Farm, Non- Farm, and off farm, Agricultural practices and sustainable livelihoods, types of livelihood programme and activities; Linkages with Farm and Off-farm Livelihoods; Economic Models of Rural Livelihood.

Unit II : Designing Livelihood Intervention and Promotion

Designing a suitable livelihood intervention-Observing and Understanding the

Local Economy; Selecting livelihood activities suitable for the poor in the area; Deciding on the interventions. Structural Characteristics of rural livelihoods, importance of livelihoods – sustainable livelihood frame work (SLF). Direct and indirect benefits of agriculture for rural livelihoods. Livelihood promotion approaches-Poverty and livelihood: Approaches and programs in India; Livelihood and a Rights Based Approach-MGNREGA and its critique; Livelihood and a Social Capital based approach: NRLM purpose and goals.

Unit III : Livelihood Challenges

Livelihood Challenge- Political economy of Livelihoods, Issues of access to farm and non-farm livelihoods; Livelihoods from a Gender Perspective-Feminization of agriculture/poverty, women in the unorganized sector, gender and rural livelihood, livelihood perspectives, the issue of unpaid and informal work; Livelihood Coping Mechanism- Climate Change and Livelihoods; Livelihoods and Disasters.

Unit IV : Livelihood Analysis

Livelihood Frame works – Sustainable Livelihoods Approaches (SLAs)-Definition and origins of SLA; Assets or capitals and capabilities in SLA and its linkage to the other capitals: Physical, Social, Economic, Human, Natural; Past, Present and possibilities for the future of the SLA, critiques of the approach, livelihood management cycle, Rural Livelihood Information System (RuLIS) Vulnerability Assessment- Shocks, trends, seasonality; Policies, institutional context and processes; Conceptual Frameworks-DFID, CARE, UNDP, OXFAM, BASIX livelihood triad, Nine square Mandala or Rural Livelihood System's Framework, etc. Rural livelihood systems.

Unit V : Livelihood diversification and Augmentation (LA)

Livelihood Diversification – Importance, strategies, Determinants and effects of livelihood diversification on Rural households. Rural livelihood diversity in developing countries. Livelihood diversification and poverty eradication policies, Rural livelihood diversification and its impact on farm efficiency, Livelihood Augmentation and its Pathways vis a vis Livelihood Protection and Promotion - Entrepreneurial strategies, NRM based intervention, Market based interventions, , ICT based interventions, Allied agriculture (dairy, poultry, Goatery etc.) based livelihood, Forest based Livelihoods. Transforming rural livelihoods methodology and strategies, Recent studies related to Contribution of NTFP in support to rural livelihoods and current stream of thoughts.

PRACTICALS

To understand the livelihood pattern of villagers and how the other socio – economic factors affect the livelihood of the people. Application of participatory rural appraisal skills for understanding village context.

LECTURE SCHEDULE

1. Concept of Livelihoods - Basic concepts and components of livelihood and Development;
2. Livelihood intervention: definition, types-Spatial, segmental, sector–sub-sector;
3. Livelihood Interventions in both Internal and External context,
4. Understanding Rural Livelihoods – Concepts, types and components,
5. Agricultural livelihoods - Farm, Non- Farm, and off farm, Agricultural practices and sustainable livelihoods,]

6. Types of livelihood programme and activities;
7. Linkages with Farm and Off-farm Livelihoods; Economic Models of Rural Livelihood.
8. Designing a suitable livelihood intervention-Observing and Understanding the Local Economy; Selecting livelihood activities suitable for the poor in the area;
9. Deciding on the interventions. Structural Characteristics of rural livelihoods,
10. Importance of livelihoods – sustainable livelihood frame work (SLF).
11. Direct and indirect benefits of agriculture for rural livelihoods.
12. Livelihood promotion approaches-Poverty and livelihood: Approaches and programs in India;
13. Livelihood and a Rights Based Approach-MGNREGA and its critique;
14. Livelihood and a Social Capital based approach: NRLM purpose and goals.
15. Livelihood Challenge- Political economy of Livelihoods, Issues of access to farm and non-farm livelihoods;
16. Livelihoods from a Gender Perspective-Feminization of agriculture/poverty,
17. **First Test**
18. womenin the unorganized sector, gender and rural livelihood,
19. livelihood perspectives, the issue of unpaid and informal work;
20. Livelihood Coping Mechanism- Climate Change and Livelihoods; Livelihoods and Disasters.
21. Livelihood Frame works – Sustainable Livelihoods Approaches (SLAs)-Definition and origins of SLA;
22. Assets or capitals and capabilities in SLA and its linkage to the other capitals:
23. Physical, Social, Economic, Human, Natural; Past, Present and possibilities for the future of the SLA, critiques of the approach,
24. Livelihood management cycle, Rural Livelihood Information System (RuLIS)
25. Vulnerability Assessment- Shocks, trends, seasonality; Policies, institutional context and processes;
26. Conceptual Frameworks-DFID, CARE, UNDP, OXFAM, BASIX livelihood triad, Nine square Mandala or Rural Livelihood System's Framework, etc.
27. Rural livelihood systems.
28. Livelihood Diversification – Importance, strategies, Determinants and effects of livelihood diversification on Rural households.
29. Rural livelihood diversity in developing countries.
30. Livelihood diversification and poverty eradication policies, Rural livelihood diversification and its impact on farm efficiency,
31. Livelihood Augmentation and its Pathways vis a vis Livelihood Protection and Promotion
32. Entrepreneurial strategies, NRM based intervention, Market based interventions,
33. ICT based interventions, Allied agriculture (dairy, poultry, Goatery etc.) based livelihood, Forest based Livelihoods.
34. Transforming rural livelihoods methodology and strategies, Recent studies related to Contribution of NTFP in support to rural livelihoods and current stream of thoughts.

PRACTICAL SCHEDULE

1. Apply PRA tools to Understand the village culture, evolution, Governance arrangement, social structure and its dimensions (natural resources, accessibility,

trend etc.,)

2. Exercise on finding out Socio- economic factors influencing the livelihood of the people using PRA
3. Analyze the livelihood pattern of the villagers using Sustainable Livelihood Framework (SLF)
4. Assess the dimensions of livelihood diversification of the Village
5. Formulate Livelihood strategy based on Livelihood assets
6. Perform a vulnerability assessment using Vulnerability Assessment Framework (VAF)
7. Document the livelihood coping mechanisms followed during a shock/risk (Drought , COVID-19)
8. Document the case studies of women in building a sustainable livelihood
9. Visit to an institution adopted village and examine their livelihood.
10. Presentation of report on livelihood analysis in village
11. Evaluating the impact of NRM based intervention projects
12. Visit to allied agriculture micro- enterprise for livelihood opportunities
13. Formulate a knowledge map to enhance the Livelihoods of Rural Poor through ICT based Interventions
14. Exposure to various forest based intervention and analyze the importance of NTFP in such Livelihoods
15. Design a suitable livelihood intervention to enhance rural livelihood based on your exposure to livelihood development
16. Report Presentation
17. **Final practical examination**

COURSE OUTCOME

1. This course will equip students with perspectives, knowledge and skills
2. Develop a comprehensive understanding of the livelihood concepts, various forms, approaches, tools and techniques.
3. Make the students to analyze existing livelihood pattern and strategies the sustainable livelihood intervention in the rural areas.
4. This course will helps the students to understanding the livelihoods concepts.
5. The students will familiarize the economic models and policy environments.

CO-PO MAPPING MATRIX

	PO 1	PO2	PO3	PO4	PO5
CO1	2	2	1	-	-
CO2	-	2	-	-	3
CO3	-	-	2	-	-
CO4	-	1	-	3	-
CO5	1	-	-	-	-

REFERENCES

1. Stephen Devereus, Rachel Sabates-Wheeler, Richard Longhurst, 2011. Seasonality, Rural Livelihoods and Development, E-book.
2. Carney D, Drinkwater M, RusinowT, NeefjesK, WanmaliS and Singh N.1999.Livelihoods approaches compared: A brief comparison of the livelihoods approaches of the UK Department for International Development (DFID), CARE, Oxfam and the United Nations Development Programme (UNDP).
3. Desai RM and Joshi S. 2014. Can Producer Associations Improve Rural Livelihoods? From Farmer Centres in India. The Journal of Development Studies, 50 (1): 64-80.
4. EllisF.2012.Rural Livelihoods and Diversity in Developing Countries, Oxford.
5. Mahajan V, Datta S and Thakur G. 2009.A Resource Book for Livelihood Promotion, The Livelihood School, BASIX, Hyderabad.
6. Morse S and McNamara N. 2009.Sustainable Livelihood Approach: A critique of theory and practice, Springer Science.(Chapter2).
7. PastakiaA and Oza,S. 2011. Livelihood Augmentation in Rainfed Areas: A Strategy Handbook for the Practitioner, Development Support Centre, Ahmedabad.
8. ScoonesIan.1998.Sustainable Rural Livelihoods: A Frame work for Analysis, IDS Working Paper72.
9. Ian Scoones,2009. Livelihood Perspectives and Rural Development, Journal of Peasant Studies,36(1).
10. Sahoo Niranjan, Rural Development and Livelihoods in India,New Century Publication.

E-RESOURCES

1. http://eprints.cmfri.org.in/9838/
2. https://www.econstor.eu/bitstream/10419/87578/1/767805186.pdf
3. https:/files.eric.ed.gov.
4. https://www.journalajarr.com
5. https://www.researchgate.net.
6. https://www.soas.ac.uk
7. https://www.adb.org
8. https://www.ids.ac.uk
9. https://www.ennonline.net
10. https://www.oas.org

EXT 607 FACILITATION FOR PEOPLE CENTRIC DEVELOPMENT (2+1)

OBJECTIVES

1. To orient students on the importance of the facilitation
2. To Inspires students to understand facilitation tools to influence change at the individual, group and organizational levels.
3. To understand the concepts of people centric development.
4. To gain knowledge brokering and strategic partnerships.
5. To learn the recent approaches in people centric development.

THEORY

Unit I: Introduction to Facilitation for Development

Facilitation for development in the AIS

Facilitation for development in the AIS; Understanding facilitation for development; Importance of facilitation as a core function of extension within the Agricultural Innovation Systems (AIS)

Principles, Attributes and Skills for Facilitation for Development

Basic principles of facilitation for development; Desired attributes of facilitator for development- Cognitive attributes, Emotional attributes (Emotional intelligence), Social, behavioural and attitudinal attributes; Technical skills of a facilitator for development- Design processes, Facilitation techniques and tools, the art of questioning and probing, Process observation and documentation, Visualization

Unit II: Facilitating Change in Individuals, Groups and Organisations

Realise Potential- Self-Discovery

Self-discovery to realize our potentials, Tools for self-discovery, formulating a personal vision, Taking responsibility for your own development

Group Dynamics and Working Together

Understanding the dynamics of human interaction, Group dynamics and power relations, Managing relationships, Shared vision and collective action, Tools for team building

Organizational Change Process

Organizational change process, Organizational learning to adapt to changing environments, Enhancing performance of organizations, Leadership development, Tools for organizational change

Unit III: Facilitating Operational Level Multi-stakeholder Engagements

Multi-Stakeholder Interactions

Defining stakeholders, Development of collective and shared goals, Building trust and accountability, Tools for stakeholder identification and visioning. Visualizing innovation platforms (IPs),Why are IPs important, Different models of IPs for multi-stakeholder engagement, policy engagement platforms, Generating issues and evidence for policy action, Advocacy for responsive policy processes

Unit IV: Brokering Strategic Partnerships, Networking and Facilitation

Linkages, Partnerships, Alliances and Networking

Brokering linkages and strategic partnerships, Identification of critical links, Knowledge brokering, Creating linkages with markets, Learning alliances and networking, Coordination of pluralistic service provision within the AIS, The concept of action learning and reflective practitioners, Networking

Unit V Facilitating Capacity Development

Facilitating Capacity Development-Facilitate participation and learning in development programs and projects. Virtual platforms- skills for strengthening dialogue, collaboration, shared commitment amongst diverse actors and stakeholders and current stream of thoughts.

LECTURE SCHEDULE

1. Agricultural innovation system- concept, definitions, elements.
2. People participation – concept, typology, importance & perspectives
3. Participatory and people centric development definition, approaches, advantages & disadvantages.
4. Facilitation for development – scope and importance in AIS
5. Facilitation for development- principles and engagement and interactions
6. Desired attributes of facilitator for development-cognitive attributes, emotional attributes

(emotional intelligence), social behavioural and attitudinal attributes
7. Technical skills of facilitator for development- design processes
8. Facilitation techniques and tools, the art of questioning and probing, process observation and documentation.
9. Self-discovery to realize potential to realize the potential & its importance
10. Tools for self – discovery, formulating a personal vision, Taking responsibility for personal development.
11. Human interaction-definition, dynamics, types
12. Group dynamics – group structure, characterisitics, types of groups, group development
13. Power relations in groups / society
14. Managing relationship in groups & Organizations
15. Shared vision and collective action in Groups & Organizations.
16. Teambuilding – Process, Scope, Tools
17. **First Test**
18. Organizational change process, Organizational learning to adapt to changing environment, enhancing performance of organizations, Tools for organizational change.
19. Leadership development – skills, styles
20. Defining stakeholders, Development of collective and share goals, Building trust and accountability.
21. Tools for stakeholder identification and visioning
22. Visualizing Innovation Platforms (IPs) – Importance, Different models of IPs for multi-stakeholder engagement.
23. Generating issues and evidence for policy action, Advocacy for responsive policy processes
24. Linkages, partnership, Alliances and Networking – Concept & Importance
25. Brokering linkages and strategic partnerships, identification of critical links, knowledge brokering.
26. Learning alliances and networking
27. Coordination of pluralistic service provision with in the AIS
28. Concept of action learning and reflective practitioners
29. Participation and learning in development programs and projects
30. Community Mobilization- Tools & Techniques
31. Problem Solving Approaches
32. Policies on people centric development approaches used in different development contexts
33. Study on creating linkages with markets
34. Study on Linkages and networking in FPOs and current stream of thoughts.

PRACTICAL SCHEDULE

1. Hands on exercise on facilitation skills/techniques
2. Self -discovery exercises for identifying potentials
3. Self -discovery exercises for identifying potentials-contd.
4. Exercise Working together and interaction (Group task)
5. Visit to market to study the multi-stakeholder interactions
6. Understanding organizational change process - tools
7. Case analysis on organizational change process
8. Exposure to Agricultural innovation platforms
9. Visit to Policy engagement platforms

10. Hand son exercise on Stakeholder analysis mapping,
11. Exercise on networking skills
12. Facilitating capacity building programmes
13. Visit to virtual platforms for strengthening dialogue, collaboration, shared commitment among diverse actors and stakeholders
14. Field visit to multi-stakeholder partnership projects
15. Understanding the role of liason officers in extension
16. Understanding facilitation process in FPOs/ contract farming
17. **Final practical examination.**

COURSE OUTCOMES

At the end of the course the students will

1. Learnt about Agricultural innovation systems and people centric development
2. Develop ability to understand attributes and skills for facilitation for development
3. Gain skill on the art of questioning, documentation and visualization
4. Practice group dynamics and team building exercises
5. Equip the students to appreciate the importance of facilitation skills and tools to understand the networking techniques for evaluation of strategic partnership and linkages.

CO-PO MAPPING MATRIX

	PO 1	PO2	PO3	PO4	PO5
CO1	2	2	1	0	0
CO2	-	2	-	-	3
CO3	-	-	2	-	-
CO4	-	1	-	3	-
CO5	1	-	-	-	-

REFERENCES

1. Clarke S, Blackman R and Carter I. 2004.Facilitation skills workbook -Training material for people facilitating small group discussions and activities using PILLARS Guides. Tearfund,England.
2. Davis S.2014. Using the Socratic Method as a Learning Facilitator.
3. Hanson L. And Hanson C. 2001. Transforming participatory facilitation: Reflections from practice.
4. Jost C, Alvarez Sand Schuetz T.2014. CCAFS Theory of Change Facilitation Guide. CGIAR Research Program on Climate Change, Agriculture and Food security.
5. Mind Tools. 2005. The Role of a Facilitator-Guiding an Event through to a Successful Conclusion.
6. Mittal N, Sulaiman RV and Prasad R M.2016.Assessing Capacity Needs of Extension and Advisory Services A Guide for Facilitators. Agricultural Extension in South Asia.
7. Ngwenya H,and Kibwika P,2016. NELK Module7 Introduction to Facilitation for Development, New Extensionist Learning Kit (NELK), Global Forum for Rural

Advisory Services (GFRAS).
8. Partridge,K.,Charles,J.,Wheeler,D.,Zohar,A.,2005.The Stakeholder Engagement Manual: Volume1. The Guide to Practitioners' Perspectives on Stakeholder Engagement. Stakeholder Research Associates Canada Inc.,355 Division Street Cobourg Ontario Canada K9A3R5.
9. Pye-Smith, C. 2012.Agricultural extension: A Time for Change. Linking knowledge to policy and action for food and livelihoods.
10. Van Rooyen A., Swaans, K., Cullen,B., Lema,Z. and Mundy,P. 2013. Facilitating Innovation Platforms in: Innovations platforms practice brief.

E-RESOURCES

1. https://www.tearfund.org/~/media/files/tilz/fac_skills_english/facilitatione.pdf
2. https://facilitatoru.com/training/using-the-socratic-method-as-a-learningfacilitator/
3. http://pubs.iied.org/pdfs/G01950.pdf
4. https://cgspace.cgiar.org/bitstream/handle/10568/41674/CCAFS%20TOC%20facilitation %202014%20FINAL.pdf
5. https://www.mindtools.com/pages/article/RoleofAFacilitator.htm
6. http://www.aesanetwork.org/assessing-capacity-needs-of-extension-and-advisory-services-a-guide-for-facilitators/
7. http://www.g-fras.org/en/knowledge/new-extensionist-learning-kit- elk. html#module- 7-introduction-for-facilitation-for-development
8. https://cgspace.cgiar.org/handle/10568/75389
9. https://assets.publishing.service.gov.uk/media/57a08a28ed915d3cfd000602/Brief10.pdf
10. https://www.researchgate.net

EXT 608 TRENDS IN E-EXTENSION FOR AGRICULTURAL DEVELOPMENT (2+1)

OBJECTIVES

To enable the students to learn about

1. Concepts of Information and communication technologies
2. e-Agriculture Initiatives and dissemination strategies
3. Use of ICT tools in Agricultural Extension.
4. Role of social media in transfer of farm information
5. e-Extension applications in agriculture

THEORY

UNIT I: Importance of Cyber Extension on Agricultural Information Dissemination

Cyber Extension or e- extension – Concept of cyber extension its role in agriculture and rural development - ICTs –definition – tools and application in extension education – Reorganizing the extension efforts using ICTs – advantages – limitations and opportunities.

UNIT II: e-Agriculture Initiatives and Extension Reforms

ICT programmes/ projects in agriculture – National and international cases of extension projects using ICT and their impact of agricultural extension – Different approaches (models) to ICTs – ICT use in field of extension – Expert systems on selected crops and enterprises – Self

learning CDs on package of practices, diseases and pest management – Agricultural websites and portals related crop production and marketing etc.Digital Libraries and repositories for Agricultural Knowledge Management.

UNIT III: e-Agriculture Dissemination Strategies

Community Radio – Web, Tele, and Video conferencing – Computer Aided Extension – Knowledge management – Information kiosks – Multimedia – Online – Offline Extension Tools-Mobile technologies, e-learning concepts.

UNIT IV: ICT Hardware and Software Tools

ICT tools- print and electronic media, e-mail, Internet, use of multimedia, use of mobile phony, computer-assisted instructions, touch screens, micro-computers, web technologies and information kiosks.

Networking system of information and challenges in the use of ICT. E-learning, information resources, sharing and networking. Types of net work – PAN, LAN, WAN, Internet, AGRINET, AKIS, Indian National Agricultural Research database

UNIT V: Social Media In Opening Access To E- Agriculture

ICT Extension approaches – prerequisites, information and science needs of farming community – Need integration – Human resource information – Intermediaries – Basic e-extension training issues – ICT enabled extension pluralism – Emerging issues in ICT. Problems and prospects of ICTs in farm based development, Digitisation, Simulation models, Utilization of Internet for promoting advanced agricultural 56echnologies; communication with marginal, small and big farmers. Social Media – Platform and Tools for Sharing Agricultural Information and current stream of thoughts.

PRACTICAL

Visit to various educational institutes and organizations to get first-hand knowledge on the application of numerous modern ICT tools in the fields of education, teaching and extension.

LECTURE SCHEDULE

1. Cyber Extension or e – extension , Concept of cyber extension and its role in agriculture and rural development
2. ICTs – definition – tools and application in extension education
3. Reorganizing the extension efforts using ICTs – advantages – limitations and opportunities
4. ICT programmes / projects in agriculture
5. National and international cases of extension projects using ICT and their impact of agricultural extension
6. Advanced approaches (models) to ICTs
7. ICT use in field of agricultural extension
8. Expert systems on selected crops and enterprises
9. Self learning CDs on package of practices, diseases and pest management
10. Agricultural websites and portals related crop production and marketing etc.
11. Digital Libraries and repositories for Agricultural Knowledge Management
12. Community Radio, Web, Tele, and Video conferencing
13. Advances in computer Aided Extension
14. Knowledge management, Information kiosks
15. Multimedia, Online and Offline Extension Tools,

16. Mobile technologies, e-learning concepts.
17. **First Test**
18. ICT tools
19. Print and electronic media
20. e-mail, Internet, use of multimedia, use of mobile phony
21. Computer assisted instructions, touch screens, microcomputers, web technologies and information kiosks.
22. Networking system of information and challenges in the use of ICT.
23. e-learning, information resources,
24. Sharing and networking. Types of net work – PAN, LAN, WAN,
25. Internet, AGRINET, AKIS, Indian National Agricultural Research database
26. ICT Extension approaches – prerequisites, information and science needs of farming community
27. Need integration – Human resource information – Intermediaries
28. Basic e-extension training issues
29. ICT enabled extension pluralism – Emerging issues in ICT
30. Problems and prospects of ICTs in farm based development
31. Digitization, Simulation models
32. Utilization of Internet for promoting advanced agricultural technologies
33. E-communication with marginal, small and big farmers
34. Social Media – Platform and Tools for Sharing Agricultural Information and current stream of thoughts

PRACTICAL SCHEDULE

1. Visit to the National Informatics Centre, Cuddalore
2. Visit to a Community Radio Station, Pondicherry
3. Visit to MSSRF to study about ICT usage
4. Visit to the Educational Multimedia Research *Centre* (EMRC), Anna University, Chennai
5. Visit to Meteorological Centre to study about Advisory to Farmers
6. Visit to TneGA – Tamilnadu e-Governance Agency
7. Visit to a Newspaper Agency
8. Visit to Doordarshan Kendra
9. Visit to All India Radio.
10. Visit to a Private TV Channel.
11. Visit to Central Institute of Tool Design Extension centre.
12. Visit to Centre for Educational Media & Technology, National Institute of Technical Teachers' Training and Research., Taramani.
13. Visit to Tidal Park.
14. Visit to the Directorate of Agriculture to study about use of ICT.
15. Visit to National Institute of Electronics and Information Technology,Centre, Chennai.
16. Preparing a webpage & blog
17. **Final Practical Examination**

OUTCOME OF THE COURSE

At the end of the course, the students will be able to

CO1: Understand the importance of Cyber Extension on Agricultural Information Dissemination

CO 2: Assess e-Agriculture Initiatives and Extension Reforms

CO 3: Evaluate e-Agriculture Dissemination Strategies
CO 4: Use ICT Hardware and Software Tools
CO 5: Appreciate the role of Social Media in transfer of agricultural information

CO - PO MAPPING TABLE

CO	PO 1	PO 2	PO 3	PO 4	PO5
CO1	3	3	-	-	-
CO2	3	3	-	2	-
CO3	3	3	3	3	-
CO4	3	-	3	3	3
CO5	3	3	3	3	3

REFERENCES

1. Bhatnagar S.C., (2004) "E-Government : From Vision to Implementation – A Practical Guide with Case Studies", SAGE Publications Pvt. Ltd., New Delhi.
2. Bhatnagar, S. &Schware R. (2000). Information and Communication Technology in Development: Cases from India. New Delhi, India: Sage Publications.
3. Punjabi, N.K and L.L.Somani. (2012). Cyber Extension for Rural Development, Udaipur: Agrotech Publishing Academy
4. Saravanan, R., (2010). ICTs for Agricultural Extension: Global Experiments, Innovations and Experiences, New India Publishing Agency (NIPA), New Delhi.
5. Saravanan, R., and Suchiradipta Bhattacharjee, (2014). Mobile Phone Applications for Agricultural Extension in India, In: Saravanan, R (Ed.).Mobile Phones for Agricultural Extension: Worldwide mAgri Innovations and Promise for Future, New India Publishing Agency, New Delhi.
6. Batnakar S & Schware R. 2000. Information and Communication Technology in Development- Cases from India. Sage Publication, New Delhi.
7. Meera SN. 2008. ICTs in Agricultural Extension: Theory to Practical. Ganga - Kaveri Publication. House, Varanasi.
8. Willem Zip. 1994. Improving the Transfer and Use of Agricultural Information – A Guide to Information Technology. The World Bank, Washington.
9. Meenambigai J,2019. .e-book on e-Extension Kindle Unlimited, Amazon Publishers, ASIN:B07MZRN7KW.
10. Nikulsinh Madhusinh Chauhan,2009. ICTs in Agriculture – Opinion of the farmers. Astral International Pvt. Ltd.

E-RESOURCES

1. https://www.thejakartapost.com/news/2013/06/04/cyber-extension - a- new- hope-agriculture – and-rural-development.html
2. http://www.manage.gov.in/publications/edigest/1999-1.pdf
3. http://www.caluniv.ac.in/global-mdia

4. https://www.researchgate.net/publication/280039298_Ahuja_Vivek_Cyber_extension_A_convergence_of_ICT_and_agricultural_development_Global_Media_Journal-Indian_Edition_22_2011_1-8
5. http://www.fao.org/e-agriculture/blog/icts-and-agricultural-extension-services
6. https://jnkvv.org
7. https://www.manage.gov.in
8. https://www.agmoocs.in
9. https://annamaliuniversity.ac.in
10. https://www.researchgate.net

EXT 609 ADVANCED MANAGEMENT TECHNIQUES (2+1)

OBJECTIVES

1. Develop understanding on concept of MIS, its scope in agriculture extension organization.
2. Understand, develop and evaluate the MBO system.
3. To cope up with stress, resolve conflicts and develop effective inter-personal communication skills using Transactional analysis.
4. To plan and use DSS, AI, ES, PERT, CPM.
5. To get acquaint with application of advanced management techniques in extension.

THEORY

Unit I: Various Types of Extension Management, Strategic Management, Scientific Management, Knowledge management

Extension Management **-**Concept and meaning, objectives, importance – characteristics of management, principles of management, theories of management, functions of management-planning, organising, staffing, directing and leading, controlling, reporting and budgeting. Strategic Management-Concept of strategy, types of strategy, components of strategy, strategic management process, steps in strategic management, benefits of strategic management. Scientific Management-Meaning and definition, principles of scientific management, techniques of scientific management. Knowledge Management-Concept and definition, importance of knowledge management, approaches to knowledge management-knowledge management and human resource.

Unit II: Emotional intelligence- Reward and punishment- Problem solving-Talent management -Management Information System (MIS) and Management By Objectives (MBO)

Emotional Intelligence-Concept and definition, components of emotional intelligence, steps for development of emotional intelligence. Reward and Punishment-Concept and meaning, aims of reward management, elements of reward management. Problem Solving-Concept of problem solving-types of problem solving, problem solving skills, identifying and analysing problems, generating solutions, encouraging creative thinking, problem solving failure to blocks, solve problems effectively. Talent management- Meaning and definition, talent drives performance, talent management process, element of talent management, stages of talent management process, benefits of talent management. Management Information System(MIS)– Concept, types of information needs at different levels, design of MIS in an

organization; Scope for Computerization– system alternatives and evaluation– implementation– operation and maintenance of the system. Management BY Objectives (MBO) – Concept, elements, process, making MBO effective, evaluation, strengths and weaknesses.

Unit III: Transactional Analysis(TA), Stress, Team Building, Conflict Management

Transactional Analysis- Concept and meaning , ego states, development of transactional analysis, transactions and strokes, kinds of transactions, Stress-Concept and definition, causes of stress, effects of stress, the four facets of stress management, coping mechanism and managing stress, stress management approaches. Team Building-Meaning and definition, characteristics of a team, understanding teams and their structures, stages of group development, roles of team members, nature of team work, approaches of team building, facilitators and barriers to effective relationships, twelve Cs for team building, types of teams, leadership function in team building. Conflict Management-Concept and meaning, types of conflict, functional and dysfunctional conflict, conflict management, styles of conflict management, stages in conflict management, conflict management strategies.

Unit IV: Motivation, Performance Management, Performance Appraisal, Time Management, Decision Making

Motivation- Meaning and definition of motivation, characteristics of motivation, de-motivates for employees, motivation at different levels, motivating the subordinates. Performance Management-Definition, aims of performance management, characteristics of performance management, performance assessment techniques, Performance Appraisal-Concept and definition, purpose of performance appraisal. Time Management-Meaning and definition, time management techniques, time management tips, five Ds for better time management, benefits of time management. Decision Making-Definition, types of decisions, decision making skills, key elements of effective thinking and decision making, decision making steps.

Unit V: Decision Support System, Artificial Intelligence (IA), Expert system, Forecasting Techniques, Network Scheduling Techniques, SWOT Analysis, Break-Even Analysis

Decision Support System-Meaning and definition, essentials elements of DSS, classification, benefits. Artificial Intelligence (IA) and its application in extension, Expert System-Definition, components of expert system, creation of expert system. Forecasting Techniques - Concept of forecasting, definition, purpose, steps in forecasting, forecasting techniques and routes, Time series analysis, Delphi technique, their applications in extension system. Network Scheduling Techniques- Gantt chart, Line of Balance (LOB), PERT and CPM techniques, Graphical Evaluation Review Technique (GERT) and Resource Allocation and Multi-Project Scheduling (RAMPS). SWOT Analysis-Concept and meaning, procedure for SWOT analysis, SWOT Matrix, Drawback of SWOT analysis. Break-Even Analysis-The break event chart, fixed costs, variable costs, semi-variable costs.

PRACTICAL

Visit to research and management organizations to study the MIS, MBO, Stress Management and Conflict Management, skills in coping with organisational stress. Practicing Transactional Analysis **(**TA) and team building exercises. Exercise on Decision Support System- Practicing forecasting and network scheduling techniques-Delphi method, Gantt chart, LOB, PERT, CPM, SWOT and Break-Even Analysis.

THEORY SCHEDULE

1. Extension Management -Concept and meaning, objectives, importance – characteristics of management, principles of management, theories of management
2. Functions of management-planning, organising, staffing, directing and leading, controlling, reporting and budgeting
3. Strategic management-Concept of strategy, types of strategy, components of strategy, strategic management process, steps in strategic management, benefits of strategic management
4. Scientific management-Meaning and definition, principles of scientific management, techniques of scientific management
5. Knowledge management-Concept and definition, importance of knowledge management, approaches to knowledge management- knowledge management and human resource
6. Emotional Intelligence-Concept and definition, components of emotional intelligence, steps for development of emotional intelligence
7. Reward and Punishment-Concept and meaning, aims of reward management, elements of reward management
8. Problem Solving-Concept of problem solving-types of problem solving , problem solving skills, identifying and analysing problems, generating solutions, encouraging creative thinking, problem solving failure to blocks, solve problems effectively
9. Talent management- Meaning and definition, talent drives performance, talent management process, element of talent management, stages of talent management process, benefits of talent management
10. Management Information System(MIS)– Concept, types of information needs at different levels ,design of MIS in an organization
11. Scope for Computerization– system alternatives and evaluation– implementation– operation and maintenance of the system
12. Management BY Objectives (MBO) – Concept, elements, process, making MBO effective, evaluation, strengths and weaknesses
13. Transactional Analysis- Concept and meaning, ego states, development of transactional analysis, transactions and strokes, kinds of transactions
14. Stress-Concept and definition, causes of stress, effects of stress, the four facets of stress management, coping mechanism and managing stress, stress management approaches
15. Team Building-Meaning and definition, characteristics of a team, understanding teams and their structures
16. Stages of group development, roles of team members, nature of team work, approaches of team building, facilitators and barriers to effective relationships, twelve Cs for team building, types of teams, leadership function in team building
17. **First Test**
18. Conflict Management-Concept and meaning, types of conflict, functional and dysfunctional conflict, conflict management
19. Styles of conflict management, stages in conflict management, conflict management strategies
20. Motivation- Meaning and definition of motivation, characteristics of motivation, de-motivates for employees, motivation at different levels, motivating the subordinates
21. Performance Management-Definition aims of performance management, characteristics of performance management
22. Performance assessment techniques, Performance Appraisal-Concept and definition,

purpose of performance appraisal

23. Time Management-Meaning and definition, time management techniques, time management tips, five Ds for better time management, benefits of time management
24. Decision Making-Definition, types of decisions, decision making skills, key elements of effective thinking and decision making, decision making steps
25. Decision Support System-Meaning and definition, essentials elements of DSS, classification, benefits
26. Artificial Intelligence (IA) and its application in extension
27. Expert System-Definition, components of expert system, creation of expert system
28. Forecasting Techniques - Concept of forecasting, definition, purpose, steps in forecasting, forecasting techniques and routes
29. Time series analysis, Delphi technique and their applications in extension system
30. Network Scheduling Techniques- Gantt chart, Line of Balance (LOB)
31. PERT and CPM techniques
32. Graphical Evaluation Review Technique (GERT) and Resource Allocation and Multi-Project Scheduling (RAMPS).
33. SWOT Analysis-Concept and meaning, procedure for SWOT analysis, SWOT Matrix
34. Drawback of SWOT analysis. Break-Even Analysis-The break event chart, fixed costs, variable costs, semi-variable costs and current stream of thoughts.

PRACTICAL SCHEDULE

1. Visit to management institution to study about MIS
2. Visit to management institution to study about MBO
3. Visit to management institution to study about stress management
4. Visit to management institution to study about conflict management
5. Visit to research institution to study about MIS
6. Visit to research institution to study about MBO
7. Practising Transactional Analysis
8. Report writing on Transactional Analysis
9. Practising Team building exercise
10. Report writing on Team building
11. Practising forecasting technique-Delphi method
12. Report writing on Delphi method
13. Practising forecasting technique-PERT
14. Report writing on PERT
15. Practising forecasting technique-CPM and Report writing on CPM
16. Practising Break Even Analysis
17. **Final Practical Examination**

COURSE OUTCOME

At the end of the course, students will be able to

CO 1: Develop understanding on concept of MIS, its scope in agriculture extension organization.

CO 2: Understand, develop and evaluate the MBO system.

CO 3: To cope up with stress, resolve conflicts and develop effective inter-personal communication skills using Transactional analysis.

CO 4: To plan and use DSS, AI, ES, PERT, CPM.

CO 5: Understand motivation, Performance Appraisal, Time Management and Decision Making

CO – PO MAPPING TABLE

CO	PO 1	PO 2	PO 3	PO 4	PO5
CO1	3	3	-	3	-
CO2	3	3	2	3	-
CO3	3	3	-	3	2
CO4	3	3	-	3	-
CO5	3	3	3	3	3

REFERENCES

1. Garry, D., 2001. Human Resource Management. 7th Ed., Prentice Hall of India, New Delhi.
2. Sharma,O.P 2012. Advance Management Techniques, Agro Tech Publications, New Delhi.
3. Grower,I., Yadav L. And Grower D. 2002. Extension Management. Agrotech Publishers, Udaipur.
4. Koontz, H., and WeihrichHeinz. 2004. Essentials ofmanagement. Tata McGraw.Hill publishingCompany Ltd.
5. Prasad, L.M.2005 Principles and Practice of Management, Sultan Chand & Sons.
6. Jain J.N. and Singh P.P.2007 Modern Management: Principles and Techniques. Regal Publishers, New Delhi.
7. Sharma,O.P. Narendra Singh and Ruchira Shukla 2012. Advanced ManagementTechniques. Agrotech Publishing Academy, Udaipur.
8. Michacl Armstrong, 2001 A Handbook of management techniques,Kogn page publishers
9. Karura Jeba Mary, M.V, P.P Murugan, A Janaki Rani and J. Thilagam, 2018. A Text Book of Advanced Management System for Agricultural Extension, PPD Publishers.
10. Natarajan L, 2011. Advanced Management Theory, Margam Publication,

E- RESOURCES

1. https://www.elearn-university.org/Management%20Techniques.html
2. https://en.wikipedia.org/wiki/Management_by_objectives
3. https://www.mcc.cmu.ac.th/research/DSSARM/DSSARM.html
4. https://www.iaeng.org/publication/IME
5. https://www.joitraining.com
6. https://www.researchgate.com
7. https://www.linkedin.com
8. https://www.gnyada.com
9. https://www.sciencedirect.com
10. https://www.abebooks.com

STA 602 MULTIVARIATE STATISTICAL METHODS FOR EXTENSION RESEARCH (2+1)

OBJECTIVES

1. To learn and develop scientific view to deal with multidimensional datasets and its uses in the analysis of research data.
2. To understand the extensions of univariate techniques to multivariate frameworks and learn to apply dimension reduction techniques used in the data analysis.
3. This course lays the foundation of Multivariate data analysis. Most of the data sets in agricultural sciences are multivariate in nature.
4. To exposure the students on multivariate data structure, multinomial and multivariate normal distribution, estimation and testing of parameters, various data reduction methods
5. To help the students in having a better understanding of agricultural research data, its presentation and analysis

THEORY

Unit – I: Overview of Multivariate Statistical Methods – Basics of Multivariate Statistical Methods (MVSM).

Basic Concepts in Multivariate Statistical Analysis – Multivariate Normal Distribution – Estimation of Mean Vector and Covariance Matrix; Partial and Multiple Correlation, Multivariate Statistical Analysis using SPSS Software – Multiple Regression; Variable Selection; Linear and Non – Linear Regression models; Factor Analysis – principle Component; Discriminant Analysis; Two Variable and multivariate Regression Models.(Concepts & Applications only without derivation)

Unit – II: Data Preparation and Cleaning; Missing Data Analysis and Outlier Management.

Missing data – Meaning, Types, Methods of missing data processing, advantages and limitation, Outliers – Meaning, Types, Methods for identifying and managing outliers. Testing Assumptions of MVSM and Data transformation- Testing Assumptions of Parametric analysis – Normality, Linearity, Multicollinearity Data transformation methods. (Concepts and Applications only without derivation)

UNIT – III: Methods for Assessing Human Choice / Preferences & Decision making.

Assessing Human Preferences Structures using Conjoint Analysis – Meaning, Objectives, Design, Data Collection and Analysis, Applications in extension.

Assessment of Adoption of Agricultural Technologies using limited dependent Variable Models- Meaning, Importance, types – Logit, Probit and Tobit models, applications in extension. Decision making – Meaning, Importance, Method analytical hierarchy process. (Concepts and Applications only without derivation)

Unit – IV: Methods of Assessing Association

Methods of Assessing Association and Causality – Multiple Correlation and Multiple Regression – Meaning, Importance, Types, Methods of Estimation, Analysis and Interpretation of results, applications in extension. (Concepts and Applications only without derivation)

Unit – V: Methods of grouping objects / Variables

Principal Component Analysis – Meaning, Importance, Statistical Inference: Factor Analysis Model, Factor Interpretation for Fixed Factors, Estimation of Factor Scores, Application in Extension. Canonical Correlation and Canonical Variables – Meaning and Estimation of Canonical Correlation and Statistical Inference, Cluster Analysis, Applications in Extension and current stream of thought. (Concepts and Applications only without derivation)

PRACTICALS

Hands on experience of following methods using SPSS software, selecting appropriate MVSM, Missing data analysis and outlier management, Testing assumptions of MVSM and data transformation, Assessing human preference structures using conjoint analysis, Assessment of adoption of agricultural technologies using limited dependent variable models logit, probit and tobit., Multidimensional scaling, Multiple correlation and multiple regression, Discriminant analysis, Principal Component Analysis (PCA) and Common Factor Analysis, Cluster Analysis.

LECTURE SCHEDULE

1. Basic concepts in Multivariate statistical analysis – Multivariate normal distribution
2. Estimation of Mean Vector and Covariance matrix, Partial and Multiple correlation
3. Linear and Non-Linear Regression models – concepts and variable selection
4. Multivariate Statistical Analysis using SPSS software – Multiple Regression, Factor Analysis, Principle Component Analysis, Discriminant Analysis
5. Two variable and Multivariate Regression Models
6. Missing Data – Meaning, Types, Methods of Missing Data Processing
7. Missing Data – Advantages and Limitations
8. Outliers – Meaning, Types, Methods for identifying and managing outliers.
9. Testing assumptions of MVSM – Testing assumptions of parametric analysis.
10. Normality
11. Linearity
12. Multi-collinearity
13. Data Transformation methods – square root, angular and logarithm
14. Assessing Human Preferences Structures using Conjoint Analysis – Meaning, Objectives
15. Design, Data Collection and Analysis
16. MVSM applications in extension.
17. **First Test**
18. Assessment of adoption of Agricultural Technologies using limited dependent variable models – Meaning importance
19. Types – Logit, Probit and Tobit models
20. Decision making – Meaning, Importance
21. Methods – Analytical hierarchy process
22. Methods of assessing association and causality - Multiple correlation
23. Multiple Regression – Meaning, Importance, Types
24. Analysis and Interpretation of Results
25. Multiple Regression – Applications in Extension
26. Methods of grouping objects / variables
27. Principle Component Analysis – Meaning, Importance, Statistical Inference
28. Factor Analysis
29. Model, Factor interpretation for fixed factors
30. Estimation of Factor scores – Application in extension
31. Canonical Correlation – Meaning
32. Canonical Variables - Meaning

33. Estimation of Canonical Correlation and Statistical Inference
34. Cluster Analysis - Applications in Extension and current stream of thought.

PRACTICAL SCHEDULE

1. Hands on experience of following methods using SPSS software
2. Selecting appropriate MVSM
3. Estimation of mean vector and covariance matrix
4. Missing data analysis
5. Outlier management
6. Testing assumptions of MVSM
7. Data transformation
8. Assessing human preference structures using conjoint analysis
9. Assessment of adoption of agricultural technologies using limited dependent variablemodels – logit, probit and tobit.
10. Multidimensional scaling
11. Multiple correlation
12. Partial correlation
13. Discriminant analysis
14. Principal Component Analysis
15. Common Factor Analysis
16. Canonical Correlation and Cluster Analysis
17. **Final Practical Examination**

COURSE OUTCOMES

After completion of this course the students will be able to

1. Understand statistical multivariate data and different analysis procedures
2. Understand statistical properties of multivariate normal distribution,
3. Classify and reduced data dimensions using cluster, principal component analysis.
4. Enable the students to use cluster analysis and factor analysis.
5. Enhance skill handling PCA and structural equation modeling.

CO-PO MAPPING MATRIX

	PO 1	**PO2**	**PO3**	**PO4**	**PO5**
CO1	2	2	1	-	-
CO2	-	2	-	-	3
CO3	-	-	2	-	-
CO4	-	1	-	3	-
CO5	1	-	-	-	-

REFERENCES

1. Abdelmonem A, Virginia AC and Susanne M. 2004. Computer Aided Multivariate Analysis. Chapman & Hall/CRC.
2. Anderson TW. 1984. An Introduction to Multivariate Statistical Analysis. 2nd Ed. John Wiley.
3. Arnold SF. 1981. The Theory of Linear Models and Multivariate Analysis. John Wiley.
4. Giri NC. 1977. Multivariate Statistical Inference. Academic Press.
5. Johnson RA and Wichern DW. 1988. Applied Multivariate Statistical Analysis. Prentice Hall.
6. Kshirsagar AM. 1972. Multivariate Analysis. Marcel Dekker.
7. Muirhead RJ. 1982. Aspects of Multivariate Statistical Theory. John Wiley.
8. Muirhead, RJ. (2005) Aspects of Multivariate Statistical Theory. 2nd Ed. John Wiley.
9. Rao CR. 1973. Linear Statistical Inference and its Applications. 2nd Ed. John Wiley
10. Rencher AC. 2012. Methods of Multivariate Analysis. 3rd Ed. John Wiley.

E-RESOURCES

1. https://en.wikipedia.org/wiki/Multivariate_statistics
2. https://online.stat.psu.edu/stat505/
3. https://www.iiap.res.in/astrostat/School08/PennStateSchool08_LecNotes.pdf
4. https://www.math.uci.edu/~htucker/LectureNotes/MultivariateAnalysis.pd
5. http://i2pc.es/coss/Docencia/ADAM/Notes/MultivariateAnalysisSlides.pdf
6. http://www.statslab.cam.ac.uk/~pat/AppMultNotes.pdf
7. https://nptel.ac.in/courses/111/104/111104024/
8. https://www.researchgate.net
9. https://www.ru.ac.bd
10. https://link.springer.com

COM 601 ADVANCES IN COMPUTER APPLICATIONS (1+1)

OBJECTIVES

1. After completion of this unit of module, candidate will be able to
2. Gain the knowledge about documentation on open source tool.
3. To understand the Working knowledge of Latex typesetting language
4. Understand features of Python that make it one the most popular languages in the industry.
5. Understand the areas where Python is used.

THEORY

Unit I Introduction to Latex:

Introduction to Latex – What is Latex – Document Structure, Start Text works, Title, Section, Table of content – Typesetting Text, Font Effects, Coloured Text, Font Size, List, Comments & Spacing, Special Charcters.

Unit II Packages and Classes in Latex:

Inserting Equations – Mathematical Symbols – Table of Content – Generating New Command – Figure handling numbering, List of figure, List of Tables.

Packages – Geometry, Hyperref, amsmath, amssymbol – Classes – Article, Book, Report - The BibTex file – Inserting Bibliography – Citing – References.

Unit III MS-Access:

MS-Access: Database, concepts and types - Uses of DBMS in Agriculture; creating database.

Unit IV Introduction to Python:

Python Introduction, Technical Strength of Python, Introduction to Python Interpreter and program execution, Using Comments, Literals, Constants, Python's Built-in Data types,

Numbers (Integers, Floats, Complex Numbers, Real, Sets), Strings (Slicing, Indexing, Concatenation, other operations on Strings), Accepting input from Console, printing statements, Simple 'Python' programs.

Unit V Using Databases in Python:

Database Programming: Connecting to a database, Creating Tables, INSERT, UPDATE, DELETE and READ operations, Transaction Control, Disconnecting from a database.

LECTURE SCHEDULE

1. Introduction to Latex.
2. Document Structure.
3. Classes.
4. Typesetting Text.
5. Inserting Equations
6. Packages and Mathematical Symbols.
7. List of figure.
8. List of Tables.
9. **First Test**
10. Bibliography and References.
11. MS Access Concepts of Database, Creating Database.
12. DBMS in Agriculture.
13. Introduction to Python.
14. Built-in Data types.
15. Strings.
16. Python Console.
17. Database in Python.

PRACTICALS SCHEDULE

1. Installation of Latex, Basic Latex commands.
2. Latex Compilation, Page Layout.
3. Building a Latex document, Previewing first.tex.
4. Addition of some text in the.tex file, Finding the error and fixing it.
5. Type setting of mathematics, Writing equations, matrix.
6. Two figure next to each other, Formation of table
7. Typesetting with a new chapter heading, List of figures, List of tables.
8. Citation, Bibliography, printing your document
9. MSACCESS: Creating Database, preparing queries and reports.
10. MSACCESS: Demonstration of Agri-information system.
11. Introduction to Python, Working with Data.
12. Program Organization, Functions, and Modules, Classes and Objects.
13. Inside the Python Object System.
14. Testing and Debugging
15. Software Development Practice.
16. Packages
17. **Final Practical Examination**

COURSE OUTCOMES

At the end of the course students will be able to

CO 1: Problem solving and programming capability.

CO 2: Analyse common problems using Latex.
CO 3: Learn categories of programs.
CO 4: Construct and execute basic programs in Python..
CO 5: Use external libraries and packages with Python.

CO-PO MAPPING MATRIX

	PO 1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	0	1	3	1	2
CO3	0	3	2	3	2
CO4	3	0	0	0	3
CO 5	0	3	2	0	1

REFERENCES

1. Introduction to Latex by Tobias Oetiker
2. LaTeX: A Document Preparation System, 2nd Edition By Leslie Lamport
3. Charles Dierbach, "Introduction to Computer Science using Python", Wiley, 2015
4. Python Programming- A modular Approach (with Graphics, database, Mobile and Web Applications by Sheetal Taneja and Naveen Kumar, Pearson.
5. Head First Python by Paul Berry, O'Reilly

E-RESOURCES

1. https://www.overleaf.com/learn/latex/Bibliography_management_with_bibtex
2. https://en.wikibooks.org/wiki/LaTeX/Bibliography_Management.
3. https://wiki.python.org/moin/PythonBooks.
4. https://devfreebooks.github.io/python/
5. https://www.digitalocean.com/community/books/digitalocean-ebook-how-to-code-in-python.

NGC611-RESEARCH AND PUBLICATION ETHICS (2 +0)

Objectives:

1. To impart knowledge on research ethics, academic conduct and Integrity.
2. To sensitize the scholars about their responsibilities to science, society and eco-system.
3. To equip the scholars with techniques and skills to avoid ethical misconduct.
4. To provide hands on experience in the use various software tools in research and publication process.
5. To acquaint participants with tools and techniques popularly utilized for ensuring academic standards, avoiding plagiarism, and promoting high impact publication.

Unit 1 Philosophy, Ethics & Scientific Conduct

Introduction to philosophy: definition, nature and scope, concept, branches - Ethics**:** definition, moral philosophy, nature of moral judgments and reactions - Ethics with respect to science and

research - Intellectual honesty and research integrity - Scientific misconducts**:** Falsification, Fabrication, and Plagiarism (FFP) - Redundant Publications**:** duplicate and overlapping publications, salami slicing - Selective reporting and misrepresentation of data

Unit 2 Publication Ethics

Publication ethics: definition, introduction and importance - Best practices/ standard setting initiatives and guidelines: COPE, WAME, etc. - Conflict of Interest - Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types - Violation of publication ethics, complaints and appeals - Identification of publication misconduct, complaints and appeals - Predatory publication and journals

Unit 3 Open Access Publishing

Open access publication and initiatives - SHERPA/RoMEO Online resource to check publisher copyright & self-archiving policies - Software tool to identify predatory publications developed by SPPU - Journal finder / journal suggestion tool viz. JANE, Elsevier Journal Finder, Springer Journal Suggestion, etc.

Unit 4 Publication Misconduct

Group Discussions - Subject specific ethical issues, FFP, authorship - Conflicts of interest - Complaints and appeals: examples and fraud from India and abroad - Software tools - Use of plagiarism software like Turnitin, Urkund and other open-source software tools.

Unit 5 Databases and Research Metrics

Databases - Indexing databases - Citation databases: Web of Science, Scopus, etc., - Research Metrics (Journal) - Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score - Research Metrics (Author) - Metrics: h- Index, i10 index, altimetric.

Lecture schedule

1. Introduction to the philosophy: definition, nature and scope,
2. Concept, branches of Philosophy
3. Ethics: definition, moral philosophy, rational and non-rational approaches to ethical issues
4. Nature of moral judgments and reactions
5. Research Process-Research ethics and Guiding principles-Research Ethics Committee-Animal Ethics Committee-Approval
6. Intellectual honesty and research integrity
7. Scientific misconducts: Falsification, Fabrication and Plagiarism (FFP)-
8. Factors facilitating scientific misconducts
9. Ethics and Trust: Anonymity, Confidentiality, Conflicts of interest/role/values/ ownership and Competing interest
10. Literature search- Print, Online, key words- boolean search- Inflibnet-E-databases
11. Fundamentals of manuscript preparation
12. Technical writing skills
13. Publication ethics: definition, introduction and importance
14. Best practices/ standard setting initiatives and guidelines: COPE, WAME, etc
15. Publication misconduct: definition, Authorship-Redundant publications:

16. Duplicate and overlapping publication, Salami slicing

17. First test

18. Selective reporting and misrepresentation of data

19. Violation of publication ethics, authorship and contributor ship

20. Identification of publication misconduct, complaints and appeals: examples and fraud from India and abroad-

21. UGC and University guidelines and Punishment

22. Software tools - Use of Reference Management Tools to avoid plagiarism and automation of bibiliography

23. Software tools - Use of plagiarism software like Turnitin, and Urkund

24. Other open source software tools

25. How to publish in scholarly journals?- Open access publication and initiatives-

26. UGC- CARE List-Predatory publication journals

27. Databases -Indexing databases

28. Citation databases: Web of Science, Scopus, etc

29. Journal Metrics- (c) Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score

30. SHERPA/RoMEO Online resource to check publisher copyright & self-archiving policies

31. Software tool to identify predatory publications developed by SPPU

32. Journal finder / journal suggestion tool viz. JANE, Elsevier Journal Finder, Springer Journal Suggestion, etc.

33. How to share the publications and know the impact?

34. Author Metrics: Author ID-OrcidID- h- Index, i10 index, altmetrics

Course Outcomes:

CO 1: Will be able to identify the ethical issues in research process based on the concept of philosophy and ethics.

CO 2: Will be able to avoid scientific misconduct like fabrication, falsification and fraud in the research process by following the recommended guidelines.

CO3: Will be able to use tools like Reference Management, Journal Identification, Open Access, Plagiarism Checker and avoid misconduct.

CO4: Will be able to communicate the research findings in approved journals with high journal metrics and also improve the author metrics.

References

1. Barbara H. Stanley, Joan E. Sieber and Gary B. Melton.1996. Research Ethics: A Psychological Approach. University of Nebraska Press

2. Jeffrey A. Gliner, George A. Morgan and Nancy L. Leech.2009. Research Methods in Applied Settings: An Integrated Approach to Design and Analysis. Routledge; 2nd edition
3. Joel Lefkowitz. 2017. Ethics and Values in Industrial-Organizational Psychology. Routledge
4. Sidney Hook, Paul Kurtz, and Miro Todorovich.1977. The Ethics of Teaching and Scientific Research. Prometheus Books

ANNEXURES

ANNAMALAI UNIVERSITY
DIRECTORATE OF ACADEMIC RESEARCH
(DARE)
Annamalainagar – 608002

REQUEST FOR EXTENSION OF TIME

Name of the Scholar	:	
Roll No.	:	
Programme	:	Ph.D.
Department		
Faculty	:	
Mobile No.	:	
Email id	:	
Date of Registration of the Programme	:	
Supervisor Name & Address	:	

Reason for Extension of time :

Synopsis Submitted : Submitted/ Not submitted

Extension of time : 1 year / months* from … to …..

Signature of the Scholar

Signature of the Head of the Department
(Name with Seal)

Signature of the Supervisor
(Name with Seal)

Signature of the Dean
(Name with Seal)

ANNAMALAI UNIVERSITY
Annamalainagar – 608002
Department:

MINUTES OF THE FIRST RESEARCH ADVISORY COMMITTEE MEETING

The Research Advisory Committee Meeting of the Ph.D. Scholar, Mr./Ms.---------- (Roll No.----------) was held on----------at--------in the Department of ----------.

The following members were present.

1. Supervisor & Convener
2. Head of the Department
3. Member
4. Member
5. Member

Mr./Ms.---------- presented an overview of the proposed research work. TheResearch Advisory Committee approved the research topic as "…….". The Committee has recommended the scholar to undertake the following course work examinations based on the qualification of the candidate and the proposed research area.

Course Code	Course Title	Credits	Major / Minor/ Supportive course

Number of course works as applicable to the scholars

Member
(Signature with Name and Date)

Member
(Signature with Name and Date)

Member
(Signature with Name and Date)

Supervisor
(Signature with Name, Date and Seal)

Signature of Head of the Department
(Name with Seal)

Date :

Place:

Annexure - 3

ANNAMALAI UNIVERSITY
ANNAMALAINAGAR – 608002
DEPARTMENT:

MINUTES OF THE RESEARCH ADVISORY COMMITTEE MEETING FOR CONFIRMATION OF PROVISIONAL REGISTRATION

The Research Advisory Committee Meeting of the Ph.D. Scholar, ---------- (Roll. No. ----------) was held on ---------at --------a.m./p.m. in the Department of ------. The following members were present:

1. (Supervisor & Convener)
2. Head of the Department
3. (Member)
4. (Member)
5. (Member)

Mr./Ms. ---------- has successfully completed the following course work examinations recommended by the Research Advisory Committee. He/She has obtained the following grades in the course work.

Sl. No	Course Code	Course Title	Credits	Category	Grade / Marks
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
				GPA	

CoE signed result sheet of the course work duly attested by the Supervisor with seal should be enclosed along with this.

The scholar completed the first seminar presentation on_____to the faculty members and research scholars. The attendees list is enclosed herewith. The committee also evaluated the research work carried out by the scholar and satisfied/not satisfied with the performance of the scholar. Hence, the Committee

recommends/does not recommend the confirmation of provisional registration of the scholar, and permits/does not permit the scholar to proceed with his/her research work.

Member (Signature with Name and Date)	**Member** (Signature with Name and Date)
Member (Signature with Name and Date)	**Supervisor** (Signature with Name, Date and Seal)
Head of the Department (Signature with Name, Date and Seal)	

Date:

Place:

* Strike off whichever is not applicable

Annexure - 4

DEPARTMENT OF _____
ANNAMALAI UNIVERSITY
ANNAMALAINAGAR – 608002

CHECKLIST FOR THE CONFIRMATION OF Ph.D. REGISTRATION

1.	Research Advisory Committee meeting **Minutes and Research Performance Assessment** signed by all the RAC members	**YES/NO**
2.	No. of Courses attended .....(not applicable for M.Phil. scholars)	**YES/NO**
3.	Photocopy of mark sheets of the course works signed by COE attested by the Supervisor	**YES/NO**
4.	Original copy of the certificate for the seminar presentation	**YES/NO**
5.	Attendance particulars for the seminar presentation	**YES/NO**
6.	Comprehensive examination result mentioned in the RAC minutes	**YES/NO**
7.	Approval of Research Advisory Committee members for change of course work/ course code/course title	**YES/NO**
8.	Faculty for confirmation is same as that of Provisional Registration	**YES/NO**

Checked and found Correct

Supervisor
(Signature with Name, Date and Seal)

Head of the Department
(Signature with Name, Date and Seal)

Annexure - 6

DEPARTMENT OF _____
ANNAMALAI UNIVERSITY
ANNAMALAINAGAR – 608002

Research Progress Report

(To be submitted every semester from date of Registration)

1.	Name and Roll No. of the Scholar	:	
2.	Programme	:	Ph.D.
3.	Title of research work	:	
4.	Date of previous RAC meeting	:	
5.	Brief report of the research work carried out between previous and present RAC meetings. Mention the objectives completed:		
6.	List research paper published/accepted for publication/communicated for publication / patents (National /International) filed / approved:		
7.	National / International Conference/Symposia attended (Give details such as Name of the Conference, venue, title, period):		
8.	Overall assessment and comments about the progress of the research scholar:		

Member (Signature with Name and Date)	**Member** (Signature with Name and Date)
Member (Signature with Name and Date)	**Supervisor** (Signature with Name, Date and Seal)
Head of the Department (Signature with Name, Date and Seal)	

Note: Research Performance Assessment restricted to maximum 2 pages should besubmitted along with the minutes of RAC meeting duly signed by RAC members.

Annexure - 6

PROFORMA FOR REGISTRATION OF RESEARCH CREDITS

(**To be given during first week of semester**)

PART A: PROGRAMME

Semester: Year: Date of registration:

1. Name of the student and
2. Enrolment number:/Reg. No.:
3. Total research credits completed so far:
4. Research credits registered during the semester:
5. Program of work for this semester (list out the Items of research work to be undertaken during the semester):

Approval of advisory committee

Advisory Committee	Name	Signature
1. Supervisor		
2. Member		
3. Member		
4. Member		

Professor and Head

Approval may be accorded within 10 days of registration

Annexure - 6

PROFORMA FOR EVALUATION OF RESEARCH CREDITS

PART B EVALUATION

(**Evaluation to be done before the closure of Semester**)

Date of Commencement semester: Date of closure of semester:

Date of evaluation:

1. Name of the student
2. Enrolment number: Reg. No.:
3. Total research credits completed so far:
4. Research credits registered during the semester:
5. Whether the research work has been carried out as per the approved program:
6. If there is deviation specify the reasons :
7. Performance of the candidate : SATISFACTORY /NOT SATISFACTORY

Approval of the advisory committee

Advisory Committee	Name	Signature
1. Supervisor		
2. Member		
3. Member		
4. Member		

Professor and Head

ANNAMALAI UNIVERSITY
ANNAMALAINAGAR – 608002
DEPARTMENT:

MINUTES OF THE RESEARCH ADVISORY COMMITTEE MEETING FOR SUBMISSION OF SYNOPSIS

The Research Advisory Committee Meeting of the Ph.D. Scholar, Mr./Ms. _____(Roll No._____) was heldon _____at a.m./p.m. in the Department of_____. The following members were present.

1.	(Supervisor & Convener)
2.	Head of the Department
3.	(Member)
4. 5.	(Member) [Member]

The Research Advisory Committee critically reviewed the research work entitled "……..……..." carried out by

Mr./Ms.---------- and the contents of the draft Synopsis. The scholar completed the pre-synopsis presentation on…… to the faculty members and research scholars. The attendees list is enclosed herewith. The scholar has ..... publications in the journals (NAAS/SCI/UGC listed) from his/her research work.

The scholar has the following publications in the listed journals.

1.(Accepted/Published)

2.(Accepted/Published)

It is also certified that the Paper/Papers mentioned above are withinthe scope of the Journal and the paper/papers is/are relevant to the Ph.D. work carried out by the scholar.

The Committee is satisfied with the research performance of the scholar, the quality and quantum of research work and approves the Synopsis submission. The Committee also recommends the panel of Indian and Foreign Examiners for the evaluation of the Thesis.

Member (Signature with Name and Date)	**Member** (Signature with Name and Date)
Member (Signature with Name and Date)	**Supervisor** (Signature with Name, Date and Seal)
Head of the Department (Signature with Name, Date and Seal)	

Annexure - 7

ANNAMALAI UNIVERSITY
ANNAMALAINAGAR – 608002
DEPARTMENT:

CERTIFICATE FOR SUBMISSION OF SYNOPSISAFTER COMPLETION OF MINIMUM DURATION

1.	Name of the Research Scholar	:		
2.	Roll No.	:		
3.	Date of Provisional Registration& Confirmation	:		
4.	Faculty & Department	:		
5.	Date of RAC meeting for synopsis submission	:		
6.	Break of study availed (if any) mention the period	:		
7.	Duration of research period from the date of submission of synopsis excluding the break of study period	:	Year	Month
8.	Synopsis submitted within the minimum duration	:	Yes / No	
9.	If Yes, whether the scholar has two publications as per the Annamalai University norms	:	Yes / No	

Supervisor
(Signature with Name, Date and Seal)

Head of the Department
(Signature with Name, Date and Seal)

ANNAMALAI UNIVERSITY
ANNAMALAINAGAR – 608002
DEPARTMENT:

List of attendees for the Pre-Synopsis seminar Presentation of **Mr/Ms. ----------, Department of ----------,** held on --------- at ------. in the ----------, Annamalai University, Annamalainagar – 608 002.

Sl.No.	Name	Designation & Address	Signature
1.			
2.			
3.			
4.			
5.			

Member

(Signature with Name and Date)

Member

(Signature with Name and Date)

Member

(Signature with Name and Date)

Supervisor

(Signature with Name and Date)

Head of the Department

(Signature with Name, Date and Seal)

DIRECTORATE OF ACADEMIC RESEARCH (DARE)

ANNAMALAI UNIVERSITY

ANNAMALAINAGAR – 608002

PROFORMA FOR SUBMISSION OF SYNOPSIS

I. Registration Details:

Name of the Scholar: Contact No.: Email ID:		Roll No.:	
Name of the Supervisor: Contact No.: Email ID:			
Month and Year of Registration		Period of break of study granted, if any	
Date of Confirmation		Date of Completion of minimum period	
Faculty and Department as per the Provisional Registration Order			
Date of completion of maximum period		Extension of period approved (mention date)	upto:
Date of Research Advisory Committee meeting for approval of Synopsis		Date of submission of Synopsis	

II. Semester Fee Payment Details:

Month and Year								
Amount Paid								

III. Course Work Details:

Course Code	Course Title	Credits	Category	Grade/Marks
CGPA				
Comprehensive Examination				Pass/Fail

IV. Progress Report:

Period	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec
Date of Submission								

:

V. Proof for the Seminar Presentations (attach the Circular copies) :

VI. Publication Details:

Journal	**Published**
National	
International	

Enclose photo copy of the papers published.

VII. Details of Synopsis Fee:

Amount (Rs.)	D.D. No.	D.D. Date	Name of the Bank	Branch

VIII. Whether Synopsis submitted within the maximum duration: **YES/NO**

If No, copy of the Extension order should be enclosed:

Certify that the information furnished above is true and correct to the best of myknowledge.

Signature of the Research Scholar

Signature of the Supervisor

(Name with Seal)

Signature of the Head of the Department

(Name and Seal)

(for Office use only) Checked and Accepted

DIRECTORATE OF ACADEMIC RESEARCH
(DARE)
ANNAMALAI UNIVERSITY
ANNAMALAINAGAR – 608002

CHECKLIST WHILE SUBMITTING Ph.D. SYNOPSIS

1.	Proforma for submission of Synopsis	**YES/NO**
2.	Whether change of Supervisor is approved a.) if yes, attach a copy of the letter b.) Whether the scholar has completed a minimum of one year with the new Supervisor	**YES/NO**
3.	One copy of the Synopsis with soft copy as per Annamalai University Regulations	**YES/NO**
4.	Original Minutes of the Research Advisory Committee signed by all the members	**YES/NO**
5.	Panel of Examiners (both Indian and Foreign) **with complete and correct postal address** including Phone No, Mobile No, Fax No and correct Official E-mail ID (**typed only**)in a closed cover	**YES/NO**
6.	Recent publications list of all Foreign and Indian examiners in the last 5 years in a closed cover	**YES/NO**
7.	The panel of Foreign Examiners should not be of Indian origin	**YES/NO**
8.	Photocopy of the Provisional Registration Confirmation order	**YES/NO**
9.	Photocopies of UG and PG Degree Certificates attested by HOD	**YES/NO**
10.	Synopsis fee of Rs._____may be paid in the University Cash Counter / Bank.	**YES/NO**
11.	Photo copy of the Journal publications	**YES/NO**
12.	Photo Copy of the fee challan for all the years till the submission of Synopsis	**YES/NO**
13.	Certificate for submission of synopsis after the completion of minimum duration	**YES/NO**
14.	a.) Whether the Synopsis is submitted within the maximum duration b.) If No, enclosed copy of the Extension order	**YES/NO**
15.	Photo Copy of the circular for the pre-synopsis presentation	**YES/NO**
16.	Attendance particulars for the pre-synopsis presentation (Applicable to all scholars irrespective of year of registration)	**YES/NO**
17.	Report from "URKUND" Software attached for all Published / accepted Papers listed in Synopsis	**YES/NO**

Checked and found Correct
Signature of the Supervisor

Signature of the
Head of the Department

Annexure - 11

PANEL OF INDIAN EXAMINERS FOR Ph.D. THESIS EVALUATION

Name and Roll No. of the Scholar :
Programme : Ph.D.
Title of the Thesis :
Faculty& Dept. as per PG Qualification :
Name of the Supervisor :

Sl. No.	Name with full postal address with pin code	Area of specialization
	PANEL OF INDIAN EXAMINERS **(Preferably from IITs, NITs, Universities and Government Institutions)** **(Not less than Associate Professor)**	
1.	Name : Designation : Department : Address : Mobile : Official E-mail:	**Area of specialization** No. of Publications:
2.	Name : Designation : Department : Address : Mobile : Official E-mail:	**Area of specialization** No. of Publications:
3.	Name : Designation : Department : Address : Mobile : Official E-mail:	**Area of specialization** No. of Publications:
4.	Name : Designation : Department : Address : Mobile : Official E-mail:	**Area of specialization** No. of Publications:
5.	Name : Designation : Department : Address : Mobile : Official E-mail:	**Area of specialization** No. of Publications:

Note: For each expert, the list of publications in reputed Journals indexed with Scopus/Web of Science/Thomson Reuters/ISI with impact factor during the last five years to be enclosed.

Supervisor
(Signature with Name, Date and Seal)

Head of the Department
(Signature with Name, Date and Seal)

Dean
(Signature with Name, Date and Seal)

Annexure - 12

PANEL OF FOREIGN EXAMINERS FOR Ph.D. THESIS EVALUATION

Name and Roll No. of the Scholar :

Programme : Ph.D.

Title of the Thesis :

Faculty& Dept. as per PG Qualification :

Name of the Supervisor :

Sl. No.	Name with full postal address with zip code	Area of specialization
	PANEL OF FOREIGN EXAMINERS	
1.	Name : Designation : Department : Address : Mobile : Official E-mail:	**Area of specialization** No. of Publications:
2.	Name : Designation : Department : Address : Mobile : Official E-mail:	**Area of specialization** No. of Publications:
3.	Name : Designation : Department : Address : Mobile : Official E-mail:	**Area of specialization** No. of Publications:
4.	Name : Designation : Department : Address : Mobile : Official E-mail:	**Area of specialization** No. of Publications:
5.	Name : Designation : Department : Address : Mobile : Official E-mail:	**Area of specialization** No. of Publications:

Note: For each expert, the list of publications in reputed Journals indexed with Scopus/Web of Science/Thomson Reuters/ISI with impact factor during the last five years to be enclosed.

Supervisor
(Signature with Name, Date and Seal)

Head of the Department
(Signature with Name, Date and Seal)

Dean
(Signature with Name, Date and Seal)

Annexure - 13

PROFORMA FOR SUBMISSION OF Ph.D. THESIS

I. Registration Details:

Name of the Scholar: Contact No: Email ID:		Roll No:	
Name of the Supervisor: Contact No : Email ID :			
Month and Year of Registration		Period of break of study granted, if any	
Date of confirmation		Date of completion of minimum period	
Date of completion of Maximum period		Extension of period approved (mention date)	upto:
Date of RAC meeting for Approval of synopsis		Date of submission of thesis	

II. Extension of time for thesis submission beyond **3 months** after the submission of synopsis (if any):

Late fee details:

Amount (Rs.)	D.D. No.	D.D. Date	Name of the bank	Branch

III. Whether No Dues Certificate is enclosed:

Certified that the information furnished above is true and correct to the best of myknowledge.

Signature of the Scholar

Supervisor
(Signature with Name, Date and Seal)

Head of the Department
(Signature with Name, Date and Seal)

(For Office use only) Checked and Accepted

DIRECTORATE OF ACADEMIC RESEARCH (DARE)
ANNAMALAI UNIVERSITY
ANNAMALAINAGAR – 608002

CHECK LIST WHILE SUBMITTING Ph.D. THESIS

1.	Five Copies of the Thesis (with soft copy of the Thesis in PDF format with each copy) prepared as per the guidelines of Annamalai University	**YES/NO**
2.	(a) Whether the thesis is submitted within the maximum duration	**YES/NO**
	(b) if no, enclose copy of the extension order	**YES/NO**
3.	Whether the thesis is submitted within three months from the synopsis meeting	**YES/NO**
4.	Proforma for submission of thesis	**YES/NO**
5.	No dues certificate (original)	**YES/NO**
6.	Checked for language and grammar	**YES/NO**
7.	Report from "URKUND" software attached	**YES/NO**

Synopsis and Thesis titles are the same.

Checked and found correct

Supervisor
(Signature with Name, Date and Seal)

Head of the Department
(Signature with Name, Date and Seal)

DIRECTORATE OF ACADEMIC RESEARCH (DARE)
ANNAMALAI UNIVERSITY
ANNAMALAINAGAR – 608002

NO DUES CERTIFICATE

(To be submitted along with Thesis to

the Director, DARE, Annamalai University, Annamalainagar)

Name of the Scholar :
Programme : Ph.D.
Roll No :
Department and Faculty :
Month & Year of Submission of Thesis :

Sl. No.	Details	No Dues Certificate	Signature (Name with Seal)
1.	University Library		
2.	Department Library		
3.	D1- Section		
4.	Department of the Supervisor and Scholar		
5.	Department Store		
6.	Hostel Office		
7.	**Project Section (G/CRD)**		
8.	**Scholarship Section (H)**		
9.	Director, DARE **(For Office use Only)**		

*** Strike off whichever is not applicable**

Declaration

I hereby declare that in the event of any due from me found at a later date, I shallpay the same to the Institution.

Signature of the Scholar

Supervisor
(Signature with Name, Date and Seal)

Head of the Department
(Signature with Name, Date and Seal)

DEPARTMENT OF _____
ANNAMALAI UNIVERSITY
ANNAMALAINAGAR – 608002

MINUTES OF THE RESEARCH ADVISORY COMMITTEE MEETING FOR RESUBMISSION OF THESIS

The Research Advisory Committee Meeting of the Ph.D. Scholar, Mr./Ms._____ _____(Roll No.___) was held on_____at _____ a.m./p.m. in the Department. of_____
The following members were present:

1. (Supervisor & Convener)
2. Head of the Department
3. (Member)
4. (Member)
5. [Member]

The Comments given by the examiners have been reviewed by the Research Advisory Committee, and the committee certifies that the corrections were carried outby the scholar as suggested by the examiner(s).

He/She is permitted to resubmit the thesis.

Title of the Thesis " ".

Member
(Research Advisory Committee)

Member
(Research Advisory Committee)

Member
(Research Advisory Committee)

Supervisor
(Signature with Name, Date and Seal)

Head of the Department
(Signature with Name, Date and Seal)

Annexure - 17

DEPARTMENT OF _____

ANNAMALAI UNIVERSITY
ANNAMALAINAGAR – 608002

CIRCULAR

Ph.D. Public Viva-Voce Examination

Name of the Scholar :

Roll Number :

Faculty & Department :

Title of the Thesis :

Date and Time of Viva-voce Examination :

Venue :

Name and address of the Supervisor :

Name and address of the Indian Examiner :

All are cordially invited

Supervisor
(Signature with Name, Date and Seal)

Head of the Department
(Signature with Name, Date and Seal)

Copy to:

1. The Controller of Examinations.
2. The Deans of Faculties.
3. The Heads of Departments with request to display in the Department NoticeBoard.
4. The Director, Directorate of Academic Research (DARE).
5. The Director, Academic Affairs.
6. The Director, Directorate Research and Development (DRD).
7. The University Librarian.
8. The Heads of Departments of other Universities/Colleges/IIT/NIT/IIM withrequest to display in their Department Notice Board.
9. P.S to Vice-Chancellor.
10. P.A to Registrar.

GUIDELINES FOR THE PREPARATION OF SYNOPSIS AND THESIS

Appendix – I

GUIDELINES FOR THE PREPARATION OF SYNOPSIS

Synopsis should outline the research problem, the methodology it and the summary and conclusion of the findings. The size of the Synopsis should not exceed 15 pages of typed matter reckoned from the first page to the last page including the list of references and list of publications of the scholar. The sequence in which the synopsis should be arranged is as follows with references and list of publications in separate pages.

1) Cover page and title page (as shown in the Annexure I)
2) Text divided into suitable headings (numbered consecutively)
3) References (not more than 12)
4) List of publications (those published/accepted for publications. Mention the impact factor of the journal- only Web of science or Scopus impact factor)

Standard A4 size (297 mm x 210 mm) bond paper may be used for preparing the synopsis. The synopsis should have the following page margins:

Top edge	:	30 to 35 mm
Bottom edge	:	25 to 30 mm
Left side	:	35 to 40 mm
Right side	:	20 to 25 mm

The synopsis should be prepared using good quality white paper preferably not lower than 80 GSM. One and half line spacing should be used for typing the general text. The general text shall be typed in Font Style Times New Roman and Font Size 13. One or two tables/figures may be included at appropriate places in the text of the synopsis and they should conform to the margin specification. All page numbers (Arabic numbers) should be typed without punctuation on the upper right hand corner 20 mm from top with the last digit in line with the right hand margin. Synopsis should be soft bound with black calico cloth and using flexible cover of thick white art paper. The cover should be printed in black letters and the text for printing should be identical to what has been prescribed for the title page. The references such as journals, books, E-books, conference proceedings, patents, etc should be typed following the International standard.

Appendix – II

GUIDELINES FOR THE PREPARATION OF THESIS

The scholars are expected to read the guidelines carefully, and meticulously follow them in the preparation of the thesis. Non-compliance with any of these instructions may lead to the rejection of the thesis submitted.

1. GENERAL

This Manual is intended to provide general guidelines to the research scholars in the preparation of the thesis. In general, the thesis shall report, in an organized and scholarly fashion, an account of original research work of the research scholar leading to the discovery of new facts or techniques or correlation of facts already known (analytical, experimental hardware oriented, etc.). Thesis shall demonstrate quality as to make a definite contribution to the advancement of knowledge and the research scholar's ability to undertake sustained research and present the findings in an appropriate manner with actual accomplishments of the work.

2. SIZE OF THE THESIS

The size of the thesis shall be normally between 100 and 300 pages of typed matter reckoned from the title page to the last page of thesis including the reference section.

3. ARRANGEMENT OF THE CONTENTS OF THE THESIS

The sequence in which the thesis material should be arranged and bound asfollows:

1) Cover page and Title page (as shown in Annexure I)
2) Certificate (as shown in Annexure II)
3) Declaration by the Scholar (Annexure III)
4) Abstract
5) Acknowledgement (one page only)
6) Table of contents (Annexure IV)
7) List of Tables (Annexure V)
8) List of Figures (Annexure VI)
9) List of Abbreviations and Symbols (Annexure VII)
10) Chapters
11) Appendices (if applicable)
12) References
13) List of Publications

The Tables and Figures should be included subsequently after referring to them in the text of the thesis. The thesis starting from chapters should be printed on both sides.

4. QUALITY OF PAPER AND MARGIN SPECIFICATIONS

The thesis should be prepared using good quality white paper preferably not lower than 80 GSM. Standard A4 size bond paper may be used for preparing the thesis. The dimensions of the final bound thesis (5 copies) should be 290 mm x 205 mm.

The following page margins should be followed while preparing the thesis:

Top edge	:	30 to 35 mm
Bottom edge	:	25 to 30 mm
Left side	:	35 to 40 mm
Right side	:	20 to 25 mm

The Tables and figures should also conform to the margin specifications. Large size figures should be photographically or otherwise reduced to the appropriate size.

5. MANUSCRIPT PREPARATION

While preparing the thesis manuscript, attention should be paid to ensure that all textual matter is typewritten in the same format to the extent possible. Hence, some of the information required for the final typing of the thesis is presented in this section. The headings of all items from 2 to 12 listed in section 3 should be typed in upper case letters without punctuation and centered 50 mm below the top of the page. The text should start 4 spaces below the heading. The page numbering from 1to 8 should be done using lower case Roman numerals and the pages from 9 to 12 should be numbered using Arabic numerals.

1.1 Cover Page and title Page

A specimen copy of the cover page and title page for the thesis is given in Annexure II.

1.2 Certificate

The certificate shall be typed in double line spacing using font style Times New Roman and Font size 12 as per the format shown in Annexure III. The certificate shall be signed by the Supervisor and shall be followed by the supervisor's name academic designation, department and full address of the institution where the supervisor has guided the scholar. Signature of the co- supervisor with details should be included wherever applicable.

1.3 Abstract

Abstract should be an essay type of description not exceeding four pages outlining the research problem, methodology used and summary of the findings. This shall be typed in one and a half line spacing using Font style Times New Roman and Font size 12.

1.4 Acknowledgement

It should be very brief and restricted to one page only when typed in one and a half line spacing. The scholar's signature shall be affixed at the bottom right end above the scholar's name typed in capitals.

1.5 Table of contents

The title page, certificate and acknowledgement will not find a place among theitems listed in the Table of Contents, but the page numbers of which are in lower case Roman letters. One and a half line spacing should be adopted for typing the matter under this head. A specimen copy of the table of contents for the thesis is given in Annexure IV.

1.6 List of Tables

The list should use exactly the same captions as they are written above the tables in the text. One and a half line spacing should be used for typing under this heading.

1.7 List of Figures

The list should use exactly the same captions as they appear below the figures in the text. One and a half line spacing should be used for typing under this heading.

1.8 List of symbols and abbreviations

One and a half line spacing shall be used for typing the matter under this heading. Standard symbols, abbreviations, etc., shall be used.

1.9 Chapters

The chapters may be broadly classified into three parts: (i) introduction, (ii) the main theme of the thesis and (iii) results, discussion, summary and conclusion. The main chapters may be divided into several sections, divisions and sub-divisions. Each chapter should be given appropriate title. Titles and figures in a chapter should be placed in the immediate vicinity of the reference where they are cited.

1.10 Appendices

Appendices are provided to give supplementary information, which if included in the main text may serve as a distraction and spoil the central theme of the thesis. Appendices shall be numbered using Arabic numerals, e.g. Appendix 1, Appendix 2, etc. Tables and references in appendices should be numbered and referred at appropriate places just as in the case of chapters. Appendices shall carry the title of the work reported and the same title shall be included in the table of contents.

1.11 List of References

Any works of other researchers, if used either directly or indirectly, the origin of the material thus referred to should be indicated at appropriate places inthe thesis. Such references in the form of research articles, monographs, books, review articles, patents and proceedings shall be cited in the thesis following the international standard. A citation should be placed wherever appropriate, preferably at the end of a sentence. All the citations shall be inthe same font as the main text. The list of references should be typed 4 spaces below the heading “REFERENCES” in single line spacing using Font style Times New Roman and Font size 13.

1.12 List of Publications

The list of publications (those already published/accepted for publication in journals and papers presented in conferences/symposia) made by the research scholar during the period of research shall be reported in the table of contents.

1.13 Tables and Figures

Table means tabulated data in the body of the thesis as well as in the appendices. Others such as charts, graphs, maps, photographs and diagrams may be designated as figures. The table or figure including caption should be accommodated within the prescribed margin limits and should appear on the following page where their first reference is made. All tables and figures should be typed on the same quality paper used for the preparation of the text of the thesis. Two or more small tables or figures may be grouped and typed in a single page, if necessary. Wherever possible, the photograph(s) shall be reproduced on a full sheet of photographic paper or standard A4 size paper.

2. TYPING INSTRUCTIONS

2.1 General: The impressions on the typed/printed copies should be black in colour. One and a half line spacing should be used for typing the general text. The general text shall be typed in Font style Times New Roman and Font size

13. Long tables, long quotations, foot notes, multiline captions and references should be typed in single line spacing.

2.2 Chapters: The format for typing headings, division headings and sub-division headings are as follows

Chapter heading		CHAPTER 1 INTRODUCTION
Division heading		1.1 OUTLINE OF THESIS
Sub-division heading		1.1.1 Literature Review 1.1.1.1 Romanian views on archaeology

The word CHAPTER without punctuation should be centered 50 mm down from the top of the page. Two spaces below, the title of the chapter should be typed centrally in capital letters. The text should commence 4 spaces below this title, the first letter of the text starting 20 mm inside from the left hand margin.

The division and sub-division captions along with their numbering should be left justified. The typed material directly below division or sub-division heading should commence 2 spaces below it and should start typing 20 mm from the left hand margin. Within division or sub-division paragraphs are permitted and they should also commence 3 spaces below the last line of the preceding paragraph, with offset from the left hand margin by 20 mm.

3. NUMBERING INSTRUCTIONS

3.1 Page Numbering

All page numbers (whether it be in Roman or Arabic numbers) should be typed without punctuation on the upper right hand corner 20 mm from the top with the last digit in line with the right hand margin. The preliminary pages such as title page, acknowledgement, table of contents, etc. should be numbered in lower case Roman numerals. Pages of the main text starting with Chapter 1 should be consecutively numbered using Arabic numerals till the end of the thesis.

3.2 Numbering of Chapters, divisions and Sub-Divisions

The numbering of chapters, divisions and sub-divisions should be done using Arabic numerals only and further decimal notation should be used for numbering the divisions and sub-divisions within a chapter. For example sub- division 2 under division 4 belonging to chapter 3 should be numbered as
3.2.4. The caption for the sub-division should immediately follow the number assigned to it. Appendices, if any, should also be numbered in an identical manner starting with appendix 1.

3.3 Numbering of tables and figures

Tables and figures appearing anywhere in the thesis should have appropriate numbers. For example, if a Figure in Chapter 4 happens to be fifth, then assign 4.5 to that figure. Similar rules apply for tables. For example, if a tablein chapter 3 happens to be second, then assign 3.2 to that table. If Figures or Tables appear in Appendices, then Table 3 in Appendix 1 will be designated as Table A1.3. Similarly for Figures.

3.4 Numbering of Equations

Equations appearing in each chapter or appendix should be numbered serially, the numbering should commence afresh for each chapter or appendix. Thus for example, an equation appearing in chapter 3, if it happens to be the fourth equation in that chapter should be numbered as (3.4) thus:

$$y' + a(t)\, y = b(t) \qquad (3.4)$$

While referring to this equation in the body of the thesis it should be referred to as equation (3.4).

4. BINDING SPECIFICATIONS

Thesis side pinning/stitching, covered with wrapper printed on 300 GSM white art card and outer side gloss laminated, adhesive binding. The cover should be printed in black letters and the text for printing should be identical to what has been prescribed for the title page.

Appendix – III

A typical Specimen of Cover page and Title Page

<Font style Times New Roman>

XXXXXXXXXXXXXX

<Font Size 18><1.5 line spacing>

A THESIS <Font Size14>

Submitted by <Font Size 14><Italic>

XXXXXXX <Font Size 16>

in partial fulfillment of the requirements for the award of the degree of

<Font Size 14><Italic><1.5 line spacing>

DOCTOR OF PHILOSOPHY <Font size 16>

DEPARTMENT OF ----------

ANNAMALAI UNIVERSITY

ANNAMALAINAGAR 608 002 <Font Size 16><1.5 line spacing>

.....2021 <Font Size 14>

Appendix – IV

XXXXXXXXXXX

A THESIS

Submitted by

XXXXXXX

in partial fulfillment of the requirements for the award of the degree of

DOCTOR OF PHILOSOPHY

DEPARTMENT OF ----------

ANNAMALAI UNIVERSITY
ANNAMALAINAGAR 608 002

APRIL 2021

Appendix – V

ANNAMALAI UNIVERSITY

Dr.----------

Professor

Department of ----------

Annamalainagar 608 002

Tamil Nadu, INDIA

Mobile :

E-mail:

CERTIFICATE

This is to certify that the thesis entitled "----------" is a bonafide record of research work done by Mr/Ms. ---------- (Roll No. ----------), Research Scholar, Department of ----------, Annamalai University, Annamalainagar, under my guidance during the period ----------, and that this thesis has not previously formed the basis for the award of any degree, diploma, associateship, fellowship or other similar title to this candidate or any other candidate.

This is also to certify that the thesis represents the independent work of the candidate.

Place :

Date :

(----------)

Research Supervisor

Appendix – VI

DECLARATION

I, **----------,** Research Scholar in the Department of ----------, declare that the work embodied in this Ph.D. thesis entitled "----------" is the result of my own bonafide work carried out with my personal effort and submitted by meunder the supervision of **Dr. ----------,** Professor, Department of ----------, Annamalai University, Annamalainagar. The contents of this thesis have not formed the basis for the award of any Degree/Diploma/ Fellowship/Titles in this University or any other University or similar Institutions of higher learning.

I declare that I have faithfully acknowledged and given credit and referred to the researchers wherever their works have been cited in the body of the thesis. I further declare that I have not willfully copied others' data/work/results, etc. reported in the journals, magazines, books, reports, dissertations, theses, Internet, etc. and claimed as my own work.

Place:

Date: Signature of the Research Scholar

Roll No.:

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Annexure – VII

LIST OF ABBREVIATIONS

ABBREVIATIONS	
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