USHA MARTIN UNIVERSITY, JHARKHAND

(Established by Jharkhand Government under Sec 2 (f) of UGC Act 1956)

Ordinance No.: <u>001/2024/AGRICULTURE</u>

GOVERNING

Doctoral Degree Programme (PhD.) in Agricultural Extension

Effective from Academic Session 2023-24

Offered by

Faculty of Agriculture

CONTENTS

**ORDINANCE FOR ENROLMENT, REGISTRATION AND
AWARD OF THE DEGREE OF DOCTOR OF
PHILOSOPHY IN VARIOUS FACULTIES OF USHA
MARTIN UNIVERSITY**

The Ph.D. Programme

Usha Martin University (UMU), Ranchi (Jharkhand), recognized by the UGC Act of 1956, offers admission to its Ph. D programme in various departments/subjects/faculties offered in different faculties (Physics, English, Applied Mathematics, Commerce, Management, Computer Science, Agriculture, Pharmacy, Law, Journalism and Mass Communication and Education) and invites applications from meritorious and innovative candidates from across India. These programmes are conducted strictly as per the provisions and regulations given in the UGC (Minimum Standards and Procedure for Award of M.Phil./ Ph.D. Degrees Regulation, 2018) and Ph.D. Degree Regulations of Usha Martin University.

1. CANDIDATES

The following categories of candidates shall be eligible to be admitted into this programme:

    (i)   Full time withscholarship/fellowship
    (ii)   Full time but without any financialsupport

2. ELIGIBILITY CRITERIA FOR SELECTION

The candidates shall be admitted to Ph.D. Programme through University Entrance test followed by interview. The eligibility to appear in the entrance test shall require the candidate to have:

- Master's degree in the concerned/allied subject with minimum of

55% marks(without rounding off). But Scheduled Cast/Schedule Tribe/Backward Class/Physically Handicapped category candidates having 40% Physical disability will get 5% relaxation, as per UGC guidelines.

OR

- Those candidates, who have qualified ICAR's SRF examination, meet the university criteria for admission and are recommended by ICAR, may be admitted by the agricultural universities with or without fellowship.

Eligibility Criteria

Doctoral Degree Programme	Eligibility
Agricultural Extension	M.Sc. (Ag.) in Agricultural Extension / Agricultural Extension and Communication/Agricultural Extension Education/Extension Education

3. ADMISSION PROCEDURE

I) Direct Admission

The admission to Ph.D. Programme at Usha Martin University, Ranchi shall be made through University Entrance Test depending on the availability of seats in a subject. Any applicant seeking admission to the Ph.D. programme shall be required to submit an application in the prescribed Application Form as per the University notification through advertisement in the News Papers / University Website: www.ushamartinuniversity.com. However, the following category of candidates shall be exempted from taking University Entrance Test:

i) Candidates who have qualified UGC/CSIR/ICAR-NET/SRF examinations.

ii) Direct Awardees of Fellowships from Govt. Agencies like

DBT/DST/ICMR/ ICAR/INSPIRE/RGNF/MANF.
(Students appointed in the project sponsored by above agencies are not exempted from Entrance Test)
iii)   Foreign students sponsored by Government of India agencies like Indian Council of Cultural Relations (ICCR), Ministry of HRD, etc. and foreign students sponsored by their respective Governments/Embassies.

The selection to the Ph.D. programs shall be based on the performance in the Entrance Test and/or the Interview. The Interview is mandatory for all, including those exempted from the Entrance Test.The list of selected candidates will be displayed discipline-wise on the University website and reported to the Research Council.

4.   ENROLMENT & SEMESTER REGISTRATION

After submission of the required fee, a Roll Number will be assigned to each scholar by the Admission Office. Those admitted to the Ph.D. programme will be required to contact the Head of the department concerned and get acquainted with research facilities & faculty members of the Department. (All selected research scholars shall be required to complete their course work by physically attending classes at UMU Campus. A minimum of 75% attendance in the class would be mandatory to appear in the Semester examination.) Departments shall hold Departmental Academic committee (DAC) meetings for each candidate to finalize his/her field of research, assign Supervisor/Co-Supervisor and discuss the relevance of course work. The candidate would then fill up the enrollment form (given in **Annexure – I**) and deposit the same with the Admission office within the specified date.
Each scholar shall be required to submit the semester fee in the beginning of every semester. In case a scholar fails to submit the semester fees for two successive semesters, his/her admission shall be deemed to be cancelled.

TEMPORARY WITHDRAWAL

Under exceptional cases, a student may be allowed to temporarily withdraw from

6

Ph.D. programme, only after completion of two semesters after the admission, provided he/she has passed in all qualifying Pre-Ph.D. papers and paid all fee due. However, such withdrawals shall be allowed only for a maximum of two semesters. The time of temporary withdrawal will not count in duration mandated for submission of Ph.D. Thesis.

5. SUPERVISOR/CO-SUPERVISOR FOR THE RESEARCH SCHOLAR

Each scholar shall be assigned a Supervisor for pursuing his/her Ph.D. degree. If approved by the Research Council, another expert can be considered as a Co-Supervisor.

A Supervisor shall be:

Full-time regular faculty member of UMU holding Ph.D. Degree with strong research profile. He/she shall have eligible to guide research scholars as soon as they join the university. However, a Co-Supervisor may be from same or another Recognized University with sound research credentials.

The number of scholars that could be associated with a Supervisor shall be as per UGC guidelines: Professor - 8, Associate Professor – 6, Assistant Professor – 4.

External Supervisor

If requested by the scholar and considered necessary by the Academic Council, it may approve another teacher as Co-Supervisor for joint supervision. He/she could be an internal faculty member or an external expert from a reputed Academic/Research organization, working in the domain of proposed research similar to that of the research scholar. The External Supervisor must hold Ph.D. Degree with at least two publications.

Sponsored candidates may have an External Supervisor from the Sponsoring

Agency, if required.

In all cases, the research Supervisor shall be the full time faculty member of UMU.

In addition, the following criteria shall be followed while allocating a Supervisor/ Co- Supervisor/External Supervisor.

(a)   The research Supervisor/Co-Supervisor/External Supervisor shall be made by the DAC of the respective Department. It will make sure that the process of allocation of Co-Supervisor/External Supervisor is free from conflict of interest. (Spouses and parents shall not be allowed to be the Supervisor/Co-Supervisor/External Supervisor of any scholar.)

(b)   A scholar may have Co-Supervisor from another Department provided there is ample overlap between the research topic and demonstrated expertise of the faculty member concerned.

Change of Supervisor

Change of Supervisor/Co-Supervisor/External Supervisor may be permitted on recommendation of the DAC and Research Council after obtaining the feedback from
(i) the scholar
(ii) the present Supervisor/Co-Supervisor/External Supervisor and
(iii) the proposed Supervisor/Co-Supervisor/External Supervisor.

However, preference shall be given to the choice of the student. Further,

(a)   When the research supervisor proceeds on leave or leaves the University for a period not more than six months, the DAC shall suggest appropriate alternate arrangement for approval by the Research Council. However, the initial arrangement shall be restored once he/she returns and joins the University.
(b)   If a Supervisor leaves the university for a period exceeding six months but not more than two years, the DAC shall recommend the name of a new Supervisor, provided RC and AC approve the recommendation. However, the

original Supervisor may continue as Co-Supervisor.

(c)   If the Supervisor proceeds on leave for more than two years, he/she shall cease to be Supervisor/Co- Supervisor.

6.   DEPARTMENTAL ACADEMIC COMMITTEE (DAC)

Duly approved by the Academic Council, each Department shall have a Departmental Academic Committee (DAC) with the following composition:

(a)	Head of the Department	Chairperson
(b)	One Professor/Associate Professor by rotation of two years in order of Seniority	Member
(c)	Another Faculty Member (including Associate or Assistant Professor) of the Department with Ph. D. degree (by rotation of two years and to be nominated by the Head of the Department concerned)	Member
(d)	One Faculty Member from allied department/discipline with Ph. D Degree (by rotation of two years and to be nominated by the concerned Head through Departmental meeting)	Member

For Ph.D. related issues, Supervisor/Co-Supervisor/External Supervisor shall be special invitees in DAC meeting concerned.

Role of the Departmental Academic Committee (DAC)

The Departmental Academic Committee shall call the candidate for counseling to discuss his/her Research program/selection of Supervisor/Co-Supervisor/External Supervisor and assignment of course work before filling the enrollment form. If necessary, the DAC may consult the proposed Supervisor/Co-Supervisor/External Supervisor. The recommendation for the course work must be submitted within the specified time in the academic calendar to HOD for

9

approval.

In cases where the Supervisor has supervised the scholar for at least three years or more, the following shall be taken into consideration.

(a)   A faculty member likely to superannuate before the submission of Ph. D. thesis will continue to be the Supervisor if the thesis is deemed to be ready for submission within one year after superannuation (or end of two academic semesters whichever is early). After superannuation, the Supervisor shall become Co-Supervisor and Co-Supervisor shall become Supervisor. If the thesis is not submitted within two semesters from the date of superannuation, the superannuating faculty shall cease to be even Co-Supervisor.

(b)   In case of superannuation, the Co-Supervisor ceases to be Co-Supervisor and full responsibility shall devolve on the Supervisor. A new Co-Supervisor may be appointed, if deemed absolutely necessary by DAC.

(c)   Faculty members who cease to be in the service of the UMU may serve as External Supervisor, if the candidate has successfully completed Pre-Ph.D. seminar and shall submit the thesis within a maximum period of three months, else he/she ceases to be the Supervisor/Co-Supervisor of the scholar and a new Supervisor/Co-Supervisor must be recommended by the DAC.

In case of demise of Supervisor,

The DAC shall consider the case in all dimensions and make a suitable recommendation at the earliest.

Note: The recommendation(s) of the DAC of a scholar shall be referred to the HOD/Dean (AP) for approval and reported to Academic Council after approval of Research Council.

7. Course work for Ph.D. Programme

Credit grade point requirements

According to ICAR, 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	11
2	Minor Courses	6
3	Supporting Courses	6
4	Seminar	2
5	Research	75
	Non-credit Compulsory courses: • Research and Publication Ethics (Contact hours:2) • MOOC (Contact hours: 2)	
	Total	**100**

In a semester, a Ph.D. scholar can register a maximum of 22 credits excluding research. However, the research credits registered should not exceed 16 credits per semester. Semester-wise distribution of credits is given in the respective Ph.D. programme.

Structure and Duration of Ph.D. Course Work:
In view of quality assurance, every scholar will be required to successfully transact the Course Work, named as the Pre-Ph.D. Course Work, as a pre-requisite so as to appreciate the perspective, pedagogy and their implications in their chosen areas of investigation.

As such, completion of Ph.D. Course Work is an essential condition for award of Ph. D degree. Detailed mark sheet will be issued to those who successfully complete Course Work.

Attendance:
A candidate admitted to Ph.D. Course Work must fulfill the following requirements:

11

(i)   Has been on the rolls of the Department throughout the semester preceding the examination.
(ii)   Has attended a minimum of 75% of the delivered number of lectures in each paper.

Programme Structure
Semester wise distribution of credit:

Semester	Major Course	Minor Course	Supporting Course	Seminar	Research	Total credit	Non-credit Compulsory course
I	6	4	4	0	10	**24**	-
II	5	2	2	1	10	**20**	-
III	-	-	-	1	10	**11**	Research and Publication Ethics
IV	-	-	-	-	20	**20**	**MOOC**
V	-	-	-	-	10	**10**	-
VI	-	-	-	-	15	**15**	-
Total credit	**11**	**6**	**6**	**2**	**75**	**100**	-

a.   Medium of instruction: English
b.   In Semester II, the allotment of a supervisor for Ph.D. scholars will take place.
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

Sl. 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 (30marks) (1.5hours duration)

1	Definitions/concepts	5 out of 7	(5x1)	5marks
2.	Short notes	5 out of 7	(5x3)	15 marks
3	Essay type	2 out of 3	(2x5)	10 marks

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

1.	Short notes	5out of 7		(5x4)	20 marks
2	Essay type	5out of 7 (Four questions must represent K6 level of Bloom's taxonomy)		(5x10)	50 marks

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

1.	Short notes	5out of 7	(5x2)	10 marks
2	Essay type	5out of 7	(5x6)	30 marks

Doctorial 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.

Seminar Topic

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.

Under the guidance and supervision of the Research Supervisor of the Research Academic Council (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 75% attendance in the semester in the presence of the HOD, RAC, staff and post-graduate students of the concerned department.

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.

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.

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

Discussion	30	
Total	**100**	

COURSE OUTLINE:

Course No.	Title of the course	Credits
1ˢᵗSemester		
Major subjects		
EXT 601	Advances in Agriculture Extension	2+1
EXT 602	Advanced Designs and Techniques in Social Science Research	2+1
EXT607	AdvancedManagementTechnique	2+1
Minor Subjects		
PH/1001	Research Methodology	4+0
PH/1003	Research and Publication Ethics	2+0
Supporting Courses		
STAT531	DataAnalysisUsingStatisticalAnalysis	2+1
PH/1002	Computers in Research	4+0
2ⁿᵈSemester		
Major Courses		
EXT 603	Advances in Training Technology	2+1
EXT 604	Organizational Development	2+1
EXT609	Transfer ofTechnologyin Agriculture	2+1

	Minor Courses	
AG ECON 601	Advanced Micro-Economic Analysis	1+1
AG ECON 602	Advanced Macro-Economic Analysis	2+0
	Supporting Courses	
STAT521	AppliedRegressionAnalysis	2+1
	Seminar	
EXT 691	Doctoral Seminar-I	0+1
	3rdSemester	
EXT 692	Doctoral Seminar-II	0+1
	4thSemester	
	Doctoral Research	0+20
	5thSemester	
	Doctoral Research	0+25
	6thSemester	
EXT 699	Doctoral Research	0+75

Syllabus

EXT601AdvancesinAgriculturalExtension   2+1

L	T	P	C
3	2	1	3

Course objectives:

1. Critically analyze different Agricultural Extension approaches
2. Applying Agricultural Knowledge Information System (AKISs) ITK
3. Visualise Advances in Extension – Cyber extension, ICT enabled extension services; Market Led Extension, Public Private Partnership, Mainstreaming gender in extension organizational Innovations.
4. Visualise implications of WTO – AOA and develop extension strategies.
5. Applying extension reforms and Farmer Field Schools Decentralized Decision Making, bottom up planning, ATMA, FSBE & CIGs etc., ATIC, IVLP & Kisan Call Centres

Course Outcome: Upon completion of the course students will be able to:

CO 1. Critically Analyze Different Approaches of Agricultural Extension
CO 2. Integrate Indigenous Knowledge Systems into Agricultural Research
CO 3. Evaluate Cyber Extension Projects and Their Impacts
CO 4. Develop Market-Led and Farmer-Led Extension Strategies
CO 5. Assess Contemporary Issues and Reforms in Agricultural Extension

UNITI

Approaches of Agricultural Extension: A critical analysis of differentapproachesofagriculturalextension.Importanceandrelevanceofindigenou s knowledge system, identification and documentation of

17

ITK,IntegrationofITKsysteminresearchformulation,ConceptofAgriculturalKnow ledgeandInformationSystem,TrainingofStakeholdersof AKIS.

UNITII

Cyber Extension - Concept of cyber extension, national and internationalcases of extension projects using ICT and their impact of agriculturalextension,alternativemethodsoffinancingagriculturalextension-Scope,limitationsandexperienceandcases.

UNIT III

Research-Extension-Farmer - Market linkage: Importance, Scope, Implications etc., Market -Led Extension, Farmer - Led Extension, Concept of Farm Field School,FarmSchool,Public-PrivatePartnership:Meaning,Models,Identification of various areas for partnership, Stakeholder's analysis inExtension,MainstreaminggenderinExtension -IssuesandProspects.

UNITIV

Implications of WTO - AOA for extension services, re-orientation ofextension services for agri-business and marketing activities, GOI-NGOcollaborationto improveefficiencyof extension.

UNITV

Extension and contemporary issues: Extension and issues related to ruralpoverty, Privatization of Extension, Intellectual Property Rights (IPRs).Extension Reforms in India - Decentralized decision making, Bottom upplanning,FarmingSystemandSituationbasedExtensionDeliverySystem,Extensi ondeliverythroughCommodityInterestGroups,OrganizationinnovationsinExtensi on-ATIC,IVLP,KisanCallCenters.

Practical

Analysis of ITK systems, cases on integration of ITK and formal research system,Analysisofcasesoncyberextensionandprivatizationofextension, Analysis of ATMA and SREP, Practicing bottom up planning.Visit to Public-Private – Farmer partnership, Leanings from Food andNutritionalSecurityandbio-diversityProjects andProgrammes.

SuggestedReadings

Bagchi J. 2007.*Agriculture and WTO Opportunity for India*. Sanskruti.ChambersR,PacyA&ThruppLA.1989.*FarmersFirst*.Intermediate TechnologyPubl.

CrouchBR&ChamalaS.1981.*ExtensionEducationandRuralDevelopment*.Macmillan.

JohnKC,SharmaDK,RajanCS&SinghC.1997.*FarmersParticipationinAgriculturalResearchandExtensionSystems*.MANAGE,Concept Publ.Co.

Khan PM. 2002.*Text Book of Extension Education*. Himanshu

Publ.NarasaiahML.2005.*AgriculturalDevelopmentandWorldTrade Organization*.DiscoveryPubl.

TalwarS.2007.*WTOIntellectualPropertyRights*.SerialsPubl.

VandenBanBW&HawkinsBS.1998.*AgriculturalExtension*.S.K.Jain Publ.

VenkaiahS.2001.*NewDimensionsofExtensionEducation*.AnmolPubl.

EXT602AdvancedDesignsandTechniquesinSocialScienceResearch2+1

L	T	P	C
3	2	1	3

Course objectives:

1. Develop & Standardize Attitude scale using different techniques of attitude scale construction.
2. Develop skills of using Projected & Semi Projected Techniques, Computer Package analysis and PRO Tools in Extension Research.

Course Outcome: Upon completion of the course students will be able to:

CO 1. Construct and Apply Attitude Scales
CO 2. Assess the Reliability and Validity of Measurement Scales
CO 3. Analyze Sociometric Data and Content
CO 4. Utilize Projective Techniques and Computer Packages
CO 5. Conduct Comprehensive Impact Analysis

UNITI

Scalingtechnique-

meaning,types,principles,stepsandquality,techniquesofattitudescaleconstruction-Pairedcomparison.

UNIT II

Equalappearing intervals, Successive Intervals, Summated ratings, Scalogramanalysis,Scalediscriminationtechnique,ReliabilityandValidityof Scales.

UNIT III

Sociometrics, content analysis, case studies, Q-sort techniques,Semanticdifferential technique.

UNITIV

Projective and Semi projective techniques, Critical incident techniques,Computerpackagesforanalysis-usageinExtensionResearch,Knowledgescalemeasurement,Participatorytoolsandtechniquesinbehavior.

UNIT V

Research – Data collection and Evaluation, Impact analysis, e-datacollection and information analysis.

Practical

Practice in constructing a scale and use of scale in various situations.Reliability andvalidity of the scalesdeveloped,Applicationof SemiProjectiveandProjectivetechniques,Contentanalysis,casestudies,practicing participatory tools and techniques. Hands on experience onComputerPreparationandDataCollectioninstruments,reviewofpreviousstudies.

SuggestedReadings

Burns RB. 2000.*Introduction to Research Methods*. Sage Publ.ChandrakandanK&KarthikeyanC.2004.*BehavioralResearch Methodology*.ClassicalPubl.
DaivadeenamP.2002.*ResearchMethodologyinExtensionEducation*. Agro-TechPubl.Academy.
KerlingerNFred.2002.*FoundationsofBehaviouralResearch*.SurjeetPubl.

KothariCR.2000.*ResearchMethodologyMethods&Techniques*.2ndEd.WishwaPrakasham.

RayGL&MondalS.1999.*ResearchMethodsinSocialScienceandExtensionEducation*. NayaProkash.

RogerL &Domino WSK. 1980.*ResearchMethods*.Prentice

Hall.SadhuAM&SinghA.2003.*ResearchMethodologyinSocialScience*.

Sinha SC & Dhiman AK. 2002.*Research Methodology*. ESS

Publ.VermaRK&VermaG.2002.*ResearchMethodology*.Commonwealth Publ.

WalizerMH&PanlL.2002.*ResearchMethods&Analysis;SearchingforRelationships*.Wiemil Harper&Row.

WilkinsonTS&BhandarkarPL.2002.*MethodologyandTechniquesofSocial Research*. Himalaya Publ. House.

EXT 603 Advances in Training Technology2+1

L	T	P	C
3	2	1	3

Course Objective
1. Plan and design a training programme
2. Plan & Develop effective training sessions
3. Manage difficult situations while organizing training programmes
4. Use different advanced participatory training

   methods

Course Outcome: Upon completion of the course students will be able to:

CO 1. Design Effective Training Programs
CO 2. Develop Experiential Training Sessions
CO 3. Utilize Advanced Training Techniques
CO 4. Apply Laboratory Methods and Psychological Instruments

CO 5. Evaluate Training Effectiveness Using Participatory Techniques

Theory

UNITI

Paradigm shift in training - learning scenario, Training Approaches – Experiential learning - laboratory - organization development (system)approaches;TrainingDesign,Designinganeffectivetrainingprogramme, harmonizing training needs, Course Objective, content andmethods.

UNITII

Designinganeffectivetrainingsession-thesemanticsinvolved,Designingexperientialtrainingsessions,simulationexercises,andopenness in training transaction - managing dilemmas, ambivalence andconflictsand confusion(forboth trainersand trainees).

UNITIII

RecentTrainingTechniquesforunderstandingandfacilitationteambuilding,groupdynamics,motivationandempowerment,

UNIT IV

Laboratorymethods: micro-lab process work, and sensitivity training, Psychologicalinstrumentsas trainingtools:

TAT,Inventories,Cases,etc.

UNITV

ParticipatoryTrainingTechniques-Lecture,Brainstorming,GroupdiscussionandTrainingGames.RolePlay,Psycho-drama,Coaching,Counseling,etc.,Trainer'srolesanddilemmas,FactorsEffectingTrainingEffectivenessand TrainingEvaluation.

Practical

Techniquesofparticipatorytrainingneedassessment.FormulationofCourse Objective, design of training programmes,Simulation exercises,Participatorytrainingmethods-RolePlay&Brainstorming,GroupdiscussionandCounselingandConductingexperientiallearningsessions,Trainingevaluation-TechniquesofKnowledge,Skill& Attitudeevaluation.Visittotraininginstitutionsandstudyoftrainingtechnologiesfollowed.

SuggestedReadings

AgochiyaD.2002.*EveryTrainer'sHandbook*.SagePubl.

AlanB&Calardy2004.*FiveCaseStudiesinManagementTraining*. JaicoPubl.

Kumar A. 2000.*Management Training Process.* Anmol

Publ.LeslieRae. 1998.*Techniquesof Training*.Jaico Publ.

LyntonRP&PareekU.1999.*TrainingforDevelopment*.2ndEd.VistarPubl.

Reid MA. 1997. *Training Interventions, Managing EmployeeDevelopment*.Jaico.Publ.

Samanta RK. 1993. *Training Methods for Management andDevelopment*.M.D.Publ.

SethyED.2003.*APractical HandBookon Training*.AnmolPubl.

EXT604OrganizationalDevelopment2+1

L	T	P	C
3	2	1	3

Course Objective
1. Understand & Study the Organization in terms of types, Characteristics, Needs, Motives, Organization behavior, Organization Communication, Organization development and Individual behavior in organization.
2. To analyze the factors effecting organizational effectiveness and distinguish between functional and non functional organization

Course Outcome: Upon completion of the course students will be able to:

CO 1. Analyze Organizational Theories and Structures
CO 2. Evaluate Organizational Behavior and Dynamics
CO 3. Apply Systems Approach in Organizational Analysis
CO 4. Design Effective Organizational Structures
CO 5. Design Effective Organizational Structures

Theory

UNITI

Introductiontoorganizations:ConceptandCharacteristicsoforganizations, Organizational Behvaiour - Context and concept - levels oforganizations–formalandinformalorganizations,Theoriesoforganizations:Natureoforganizationaltheory-classicaltheories-featuresofBureaucracy-administrativetheoryandScientificmanagement - Neo-classical theories - the human relations movement -moderntheory.

UNITII

Systems approach to study organization needs and motives - Attitude,values and ethical behaviour - alienation and work - work motivation - communicationandinterpersonalbehaviour-organizationcommunication-leadershipbehaviour-decisionmaking,problem solvingtechniques-organizationalclimate–changepronenessandresistance to change, Organizational change, Organizational structure -Processin organizing-Dimensionof MotivationClimate.

UNITIII

Departmentation-SpanofManagement-Delegationofauthority–Centralizationanddecentralization-lineandstafforganization-functional organization - divisonalisation - Project organization - Matrixorganization - freeformorganization -topmanagement structure.

UNITIV

Individual behaviour in organization, Fundamentals of Human relationsand Organizational behaviour, Groups and teams - Organizational cultureandperformance,DynamicsofOrganizationbehaviour-leadershipconflictsituationandintergroupbehavior-OrganizationalDevelopment

UNIT V
Factorseffectingorganizationeffectiveness,Creativity,leadership,motivationand organization development.

Practical

Analysisoforganizationintermsofprocess-attitudesandvalues,motivation, leadership, Simulation exercises on problem-solving - Studyoforganizationalclimateindifferentorganizations.Studyoforganizationalstru

ctureofdevelopmentdepartments,Studyofdepartmentalization, span of control delegation of authority, decisionsmaking patterns, Study of individual and group behaviour at work in anorganization,Conflictsandtheirmanagementinanorganization,Comparative study of functional and non-functional organizations anddrawingfactors fororganizationaleffectiveness.

SuggestedReadings

Ancona, Kochaw, Scully, Van Maanen, Westney 1999. *OrganizationalBehaviour and Processes*. South Western College Publ.,NewYork.

BanerjeeM.1984.*OrganizationalBehaviour*.AlliedPubl.

DwivediRS.2006.*HumanRelationsandOrganizationBehaviour-AGlobal Perspective.* 5thEd. Macmillan.

KumarA.2000.*OrganizationalBehaviourTheoryandPractice*.AnmolPubl.

Luthans F. 1998.*Organizational Behavior*. Tata McGraw

Hill.LuthansF.2001.*OrganizationalBehaviour*.McGrawHill.

NewstromJW&DavisK.1997.*HumanBehaviouratWork*.TataMcGraw Hill.

RobbinsSP.2007.*OrganizationalBehaviour*.PrenticeHall.

ShaunT&JacksonT.2003.*TheEssenceofOrganizationalBehaviour*.
PracticeHallofIndia.

StephenRR.1999.*OrganizationalBehaviour*.5thEd.PracticeHallof India.

EXT607AdvancedManagementTechniques2+1

L	T	P	C
3	2	1	3

Course Objective
1. Develop understanding on concept of MIS, its scope in Agriculture Extension Organization
2. Analyze, 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 & use, DSS, AI, ES, PERT, CPM

Course Outcome: Upon completion of the course students will be able to:
CO 1. Design and Implement a Management Information System (MIS)
CO 2. Evaluate the Effectiveness of Management by Objectives (MBO)
CO 3. Develop Strategies for Managing Organizational Stress
CO 4. Resolve Interpersonal and Intergroup Conflicts

CO 5. Utilize Decision Support Systems (DSSs) and Forecasting Techniques

UNITI

ManagementInformationSystem(MIS):Basicconcepts,typesofinformation needed at various levels, design of MIS in an agriculturalextension organization,Scope for computerization, system alternativesandEvaluation,Implementation,operationandmaintenanceofthesystem.

UNITII

Management by Course Objective (MBO): Elements of the MBO system,The Process of MBO. Making MBO effective, Evaluation of the MBOsystem - strengths and weaknesses, Transactional Analysis (TA): Egostates,transactions,inter relationships,strokes,stamps.

UNITIII

Managing Organizational Stress: Sources of stress in organization, effectof stress. Coping mechanisms and managing stress, Stress management,Team Building Process: Types of teams, Steps in teamwork,

UNIT IV

Facilitatorsandbarrierstoeffectiverelationships,natureofprejudice,tipsinreducinginterpersonalconflicts,intergroupconflict,resolvingtechniques,Conflictmanagement,tipsinreducinginterpersonalconflicts.

UNITV

DecisionSupportSystems(DSSs):BasicinformationaboutArtificialIntelligence(AI)ExpertSystem(ESs),thei

rfutureapplicationsin extensionsystem.Forecastingtechniques-timeseriesanalysisandDelphi, decision making and talent management PERT, CPM Techniquesandtime management.

Practical

ManagementsInformationsystem,inresearch&developmentorganizations,StudyofManagementbyCourseObjectiveinanorganization,TransactionalAnalysis,exercisesonTeambuildingprocess, coping skills with organizational stress, exercises on DecisionSupportSystems(DSSs), Practicalexerciseonforecastingtechniques,Visitto Management organizations.

SuggestedReadings

Chaudhary AK.1999.*EncyclopediaofManagementInformationSystem*.
Vols.I,II.AnmolPubl.

HariGopalK.1995.*ConflictManagement-ManagingInterpersonalConflict*.Oxford & IBH.

JamesO'Brien1999.*ManagementInformationSystem*.TataMcGraw-Hill.

KoontzH&WelhrichH.2004.*EssentialsofManagement*.5thEd.Tata.
McGraw-Hill.

Lauden & Lauden 2003. *Management Information System*. Pearson Edu.Maheswari BL. 1980.

Organizational Decision Styles & Orgul Effectiveness.VikasPubl.

McGrathSJEH.2007.*BasicManagementSkillsforAll*.7thEd.PrenticeHallofIndia.

WestJD&LeevyFK.1998.*AManagementGuidetoPERT/CPMwithGERT/PDM/DCPMandOtherNetworks*.PrenticeHallofIndia.

EXT 609Transfer of Technology in Agriculture2+1

L	T	P	C
3	2	1	3

Course Objective
1. Develop through understanding on different systems of Technology Transfer
2. Develop appropriate communication & Media Strategy suitable to the System of Technology Transfer
3. Analyze the constraints in Systems of Technology Transfer and Suggest Suitable Strategies

Course Outcome: Upon completion of the course students will be able to:
CO 1. Explain Concepts of Technology and Transfer of Technology
CO 2. Differentiate Knowledge Systems in Technology Transfer
CO 3. Evaluate Communication Strategies for Technology Transfer
CO 4. Analyze Constraints and Roles in Transfer of Technology

CO 5. Design Effective TOT Programs for Resource-Poor Farmers

Theory
UNITI

Technology - Meaning and Concepts - Appropriate technology, transferoftechnology-meaningandconcepts,Systemsoftransferoftechnology

UNIT II

KnowledgeGeneratingSystem(KGS)-KnowledgeDisseminatingSystem (KDS) - Knowledge Consuming System (KCS) - Input SupplyingAgenciesSystem(ISAS).

UNITIII

Appropriateness of communication media in the system of technologytransfer,NewcommunicationstrategyfortransferandadoptionofAgriculturaltechnology,Extensiontrainingintransferoftechnology.

UNITIV

Analysis, Constraints in Transfer of Technology, agencies or departmentsinvolvedinTOT,ExtensionprofessionalinTOT,AttributesofTechnologyanditsRelationinTOTprocess.

UNIT V

TOTtoresourcepoorfarmers, Role of Key communicators or local leaders in TOT, Private andPublicpartnership in TOT.

Practical

Analysis of Transferred technology, Analysis of knowledge generationand consuming systems, Formulation of communication strategies, Studyofattributesofselectedfastspreadingtechnologiesandslowtechnologies, study of constraints in TOT, visit to TOT centers of ICARand SAU, Identification of key communicators, Case studies of Public-Private Partnerships, Visits to the print and electronic media centers tostudytheirrole in TOT.

SuggestedReadings

ChaturvediTN.1982.*TransferofTechnologyamongDevelopingCountries;NeedforStrengtheningCooperation*.GitanjaliPubl.House.

DunnDD. 1978. *Appropriate Technology with a Human Face*.
MacmillanPress.

KapoorSK,RoyPB&RoyAK.1980.*RoleofInformationCentersinTechnologyTransfer*.IASLIC,Kolakata.

LekhiRK.1984.*TechnologicalRevolutioninAgriculture*.ClassicalPubl. Co.

SinghSN.1991.*TransferofTechnologytoSmallFarmers.AnAnalysisofConstraintsand Experience*.
ConceptPubl. Co.

WallenderHW.1980.*TechnologyTransferofManagementintheDevelopingCountries*.Ballinger Publ.
Co.,Cambridge.

TextBook&Reference:

1. Kerlinger,FredN.(1995),FoundationsofBehaviouralResearch,3rd/edition,PrismHarcourtBrace
2. Kothari,CR(2004),ResearchMethodology,MethodsandTechniques,2ndrevised/edition,New AgeInternationalPublishers
3. Saunders,LewisandThornhill(2009),ResearchMethodsforBusinessStudents,3rd/edition,PearsonEducation.

AG ECON 601 Advanced Micro Economic Analysis   1+1

L	T	P	C
2	1	1	2

Course Objective
1. Understand Consumer Behavior and Demand Models
2. Analyze Market Structures and Oligopoly Models
3. Evaluate Market Failures and Externalities
4. Comprehend General Equilibrium Theory
5. Explore Welfare Economics and Social Welfare Criteria

Course Outcome: Upon completion of the course students will be able to:

CO 1. Analyze Consumer Behavior and Welfare Measures

CO 2. Evaluate Demand Models and Household Decision-Making

CO 3. Compare Market Structures and Oligopoly Models

CO 4. Apply General Equilibrium Theory to Economic Analysis

CO 5. Assess Market Failures and Welfare Economics

Theory

UNIT I

Theory of consumer behaviour – Duality in consumer theory – expenditure function and indirect utility function - Measurement of Income Effect and Substitution Effect. Measurement of Changes in Consumers' Welfare –Consumer's Surplus, Compensating Variation and Equivalent Variation – Dynamic versions of demand functions – Integrality of demand functions. Demand Models – Linear Expenditure System, Almost Ideal Demand System. Applications of consumer theory – Household model and time allocation – Labour supply decisions by households.

UNIT II

Perfect competition – Monopoly, monopolistic competition and oligopoly. Oligopoly models – collusive and non-collusive models of oligopoly –Cournot model, Chamberlin model, Stackleberg solution.

UNIT III

General equilibrium theory – Conceptual overview - General equilibrium conditions with Production and Consumption. Existence, Uniqueness and Stability of general competitive equilibrium. Walrasian general equilibrium – Mathematical derivation of conditions for general equilibrium.

UNIT IV

Market failure - Incomplete markets - Asymmetric information – Principal-Agentproblem, adverse selection and moral hazard. Externalities – Network externalities- Public goods – Optimal provision of public goods.

UNIT V

Welfare Economics - Concepts, problems, approaches and limitations of Welfare Economics, Pareto conditions of maximum welfare – Criteria for social welfare -Social Welfare functions, Social versus Private costs and benefits.

Practical

Problems in consumer utility maximization – Estimation of income and substitution effects; Estimation and comparison of Consumer's surplus, equivalent variation and compensating variation. Estimation of

demand models – Derivation and estimation of labour supply equations from household models comparativestatic analysis in consumption. Advanced problem solving in price determination under perfect competition, monopoly, oligopoly and monopolistic competition. Game theory models. Problems solving in General Equilibrium Theory and Welfare Economics. Problems in public goods provision.

Suggested Readings

Chiang AC. 1981. Fundamental Methods of Mathematical Economics. McGraw-Hill. Henderson JM & Quandt RE. Microeconomic Theory: A Mathematical Approach. McGraw-Hill.

Koutsoyiannis A. 2003. Modern Microeconomics. The Macmillan Press.

Kreps DM. 1990. A Course in Microeconomic Theory. Princeton Univ.

Press.

Silberberg E & Suen W. 2001. The Structure of Economics-A Mathematical Analysis. McGraw Hill.

Varian HR. 992. Microeconomic Analysis. WW Norton & Co.

Varian HR. 1999. Intermediate Microeconomics. Affiliated East-West Press.

AG ECON 602 Advanced Macro Economics Analysis 2+0

L	T	P	C
2	2	0	2

Course Objective
1. Analyze Key Macro Economic Concepts and Models
2. Evaluate Monetary and Fiscal Policies
3. Examine the Impact of International Economic Policies

Course Outcome: Upon completion of the course students will be able to:
CO 1. Analyze Keynesian and Consumption Theories
CO 2. Apply the IS-LM Framework and Monetary Policy Analysis
CO 3. Evaluate Economic Issues Related to Stagflation and Unemployment
CO 4. Understand and Apply General Equilibrium and Social Accounting Frameworks

CO 5. Assess the Impact of Global Policies on the Indian Economy

Theory

UNIT I

Review of Macro Economics concepts-Comparativestatistics- Keynesian theory-Consumption Function and Theories of Consumption-Saving Function and Theories of Saving.

UNIT II

Theories of Investment-Savings and Investment Equality - IS - LM Framework and its mand for and Supply of Money-Monetary Policy in the static model –Inflation.

UNIT III

Stagflation and Supply side Economics - Theory of Unemployment – Phillips Curve controversy - Inflation, Productivity and distribution - Fiscal policy: Effectiveness and Problems.

UNIT IV

Social Accounting Matrix Framework - General Equilibrium Analysis - Neo classical Macro Economics - Stochastic Macro Economics.

UNIT V

BOP & Adjustment Policies - Foreign Exchange Policy - Foreign sector: Capital and Current Account - Impact of WTO on Indian Economy - Impact of IMF &IBRD on Indian Economy - Review of Macro Economic Policies in India.

Suggested Readings

Diulio EA. 2006. Macroeconomics. 4th Ed. Schaums' Outlines.

Frogen RT. 1999. Macro Economic: Theory and Policies. 6th Ed.

Prentice Hall.

Samuelson PA & Nordhaus WD. 2004. Economics. McGraw-Hill.

Shapiro E. 1989. Macro Economic Analysis. Galgotia Publ.

STAT 521   APPLIED REGRESSION ANALYSIS   2+1

Course Objective
1. Introduction to Correlation Analysis and Measures
2. Addressing Correlated Errors and Regression Analysis
3. Advanced Multiple Regression Techniques
4. Optimal Selection of Regression Models
5. Nonlinear Regression and Model Fitting

L	T	P	C
3	2	1	3

Course Outcome: Upon completion of the course students will be able to:

CO 1. Analyze Different Types of Correlation and Their Applications

CO 2. Detect and Correct Autocorrelation and Multi collinearity

CO 3. Perform Advanced Regression Analysis

CO 4. Select the Best Regression Models and Apply ANOVA

CO 5. Model and Interpret Heteroscedastic and Nonlinear Data

UNIT I
Introduction to correlation analysis and its measures; Correlation from grouped data, Biserial correlation, Rank correlation; Testing of population correlation coefficients; Multiple and partial correlation coefficients and their testing.
UNIT II
Problem of correlated errors; Auto correlation; Durbin Watson Statistics; Removal of auto correlation by transformation; Analysis of collinear data; Detection and correction of multicollinearity; Regression analysis; Method of least squares for curve fitting; Testing of regression coefficients; Multiple and partial regressions.
UNIT III
Examining the multiple regression equation; Concept of weighted least squares; regression equation on grouped data.
UNIT IV
Various methods of selecting the best regression equation; regression approach applied to analysis of variance in one way classification.
UNIT V
Heteroscedastic models, Concept of nonlinear regression and fitting of quadratic, exponential and power curves; Economic and optimal dose, Orthogonal polynomial.
Practical
Correlation coefficient, various types of correlation coefficients, partial and multiple, testing of hypotheses; Multiple linear regression analysis, partial regression coefficients, testing of hypotheses, residuals and their applications in outlier detection; Handling of correlated errors,
multicollinearity; Fitting of quadratic, exponential and power curves, fitting of orthogonal polynomials.
Suggested Readings

Draper NR & Smith H. 1998. *Applied Regression Analysis* . 3rd Ed. John Wiley.
Ezekiel M. 1963. *Methods of Correlation and Regression Analysis* . John Wiley.
Kleinbaum DG, Kupper LL, Muller KE & Nizam A. 1998. *Applied Regression Analysis and Multivariable Methods* . Duxbury Press.
Koutsoyiannis A. 1978. *Theory of Econometrics* . MacMillan.
Kutner MH, Nachtsheim CJ & Neter J. 2004. *Applied Linear Regression Models* . 4th Ed. With Student CD. McGraw Hill.

STAT 531 DATA ANALYSIS USING STATISTICAL PACKAGES   2+1

L	T	P	C
3	2	1	3

Course Objective
1. Mastery of Data Analysis Software
2. Proficiency in Hypothesis Testing and Distribution Fitting
3. Advanced Statistical Analysis Techniques

Course Outcome: Upon completion of the course students will be able to:
CO 1. Utilize Software for Data Summarization and Analysis
CO 2. Conduct Hypothesis Testing and Goodness of Fit Analysis
CO 3. Apply ANOVA and ANCOVA in Experimental Designs
CO 4. Analyze Mixed Models and Estimate Variance Components

CO 5. Perform Advanced Multivariate and Time Series Analysis

Theory
UNIT I
Use of Software packages for: Summarization and tabulation of data; Descriptive statistics; Graphical representation of data, Exploratory data analysis.
UNIT II
Fitting and testing the goodness of fit of discrete and continuous probability distributions; Testing of hypothesis based on large sample test statistics; Testing of hypothesis using chi-square, t and F statistics.
UNIT III
Concept of analysis of variance and covariance of data for single factor, multi-factor, one-way and multi-classified experiments, contrast analysis, multiple comparisons, Analyzing crossed and nested classified designs.
UNIT IV
Analysis of mixed models; Estimation of variance components; Testing the significance of contrasts; Correlation and regression including multiple regression.
UNIT V
Discriminant function; Factor analysis; Principal component analysis; Analysis of time series data, Fitting of non-linear models; Time series data; Spatial analysis; Neural networks.
Practical
Use of software packages for summarization and tabulation of data, obtaining descriptive statistics, graphical representation of data. Robust Estimation, Testing linearity and normality assumption, Estimation of trimmed means etc., Cross tabulation of data including its statistics, cell display and table format and means for different sub-classifications; Fitting and testing the goodness of fit of probability distributions; Testing the hypothesis for one sample t -test, two sample t -test, paired t -test, test for large samples - Chi-squares test, F test, One way analysis of variance, contrast and its testing, pairwise comparisons; Multiway classified analysis of variance - cross-classification, nested classification, factorial set up, fixed effect models, random effect models, mixed effect models, estimation of variance components; Generalized linear models - analysis of unbalanced data sets, testing and significance of contrasts, Estimation of variance components in unbalanced data sets - maximum likelihood, ANOVA, REML, MINQUE; Bivariate and partial correlation, Distances - to obtain a distance matrix, dissimilarity measures, similarity measures; Linear regression, Multiple regression, Regression plots, Variable selection,

Regression statistics, Fitting of growth models - curve estimation models, examination of residuals; Discriminant analysis - fitting of discriminant functions, identification of important variables, Factor analysis. Principal component analysis - obtaining principal component, spectral composition; Analysis of time series data - fitting of ARIMA models, working out moving averages. Spatial analysis; Neural networks.

Suggested Readings

Anderson CW & Loynes RM. 1987. *The Teaching of Practical Statistics* . John Wiley.
Atkinson AC. 1985. *Plots Transformations and Regression* . Oxford University Press.
Chambers JM, Cleveland WS, Kleiner B & Tukey PA. 1983. *Graphical Methods for Data Analysis* . Wadsworth, Belmount, California.
Chatfield C & Collins AJ. 1980. *Introduction to Multivariate Analysis* . Chapman & Hall.
Chatfield C. 1983. *Statistics for Technology* . 3rd Ed. Chapman & Hall.
Chatfield C. 1995. *Problem Solving: A Statistician's Guide* . Chapman & Hall.
Cleveland WS. 1985. *The Elements of Graphing Data* . Wadsworth, Belmont, California.
Ehrenberg ASC. 1982. *A Primer in Data Reduction* . John Wiley.
Erickson BH & Nosanchuk TA. 1992. *Understanding Data* . 2nd Ed. Open University Press, Milton Keynes.
Snell EJ & Simpson HR. 1991. *Applied Statistics: A Handbook of GENSTAT Analyses* . Chapman & Hall.
Sprent P. 1993. *Applied Non-parametric Statistical Methods* . 2nd Ed. Chapman & Hall.
Tufte ER. 1983. *The Visual Display of Quantitative Information* . Graphics Press, Cheshire, Conn.
Velleman PF & Hoaglin DC. 1981. *Application, Basics and Computing of Exploratory Data Analysis* . Duxbury Press.
Weisberg S. 1985. *Applied Linear Regression* . John Wiley.
Wetherill GB. 1982. *Elementary Statistical Methods* . Chapman & Hall.
Wetherill GB.1986. *Regression Analysis with Applications* . Chapman & Hall.
Learning Statistics: http://freestatistics.altervista.org/en/learning.php.
Free Statistical Softwares: http://freestatistics.altervista.org/en/stat.php.
Statistics Glossary http://www.cas.lancs.ac.uk/glossary_v1.1/main.html.
Course on Experimental design:
http://www.stat.sc.edu/~grego/courses/stat706/.
Design Resources Server: www.iasri.res.in/design.
Analysis of Data: Design Resources Server.
http://www.iasri.res.in/design/Analysis%20of%20data/Analysis%20of%2 Data.html.

PH/1001   Research Methodology   4+0

L	T	P	C
4	4	0	4

Course Objective
1. Understand Fundamental Research Concepts and Processes
2. Design and Implement Effective Research Studies
3. Execute and Analyze Research Data Efficiently

Course Outcome: Upon completion of the course students will be able to:
CO 1. Develop and Formulate Research Ideas and Questions
CO 2. Design Effective Research Experiments
CO 3. Apply Sampling and Scaling Techniques
CO 4. Collect, Process, and Tabulate Data
CO 5. Analyze Multivariate Data for Decision Making

Unit I
Introduction to research: -
Need, concept, characteristics, objectives, importance, research components, Research ideas, Research

questions, Deciding tentative research area & topic, components of good research topic. Research types, Research Philosophy, Research Strategy, Research methods, Research process,

Unit II

Research Design: -

Feature of a good Research Design, Exploratory & Research Design – Concept, Types, Usage, Experimental Design – Causal relationships, Concept of Independent & Dependent variables, Concomitant Variable, Extraneous variable, Treatment, Control group.

Unit III

Sampling Design:-

Census and Sample survey, Implication of Sample Design, Sample size determination, Characteristics of a good Sample design, probability & non - probability sampling techniques.

Scaling Techniques:-

Measurement in Research, Types of Measurement Scales, Scaling Techniques – Likert, Thurston, Semantic Differential.

Unit IV

Data Collection & Processing-

Primary and Secondary data, Tools of data collection, Questionnaire and

Schedule distinction, Selection of appropriate method of data Collection, Data Processing , Data Coding & Classification, Data Tabulation

Unit V

Multivariate Data Analysis:-

Exploratory Data Analysis, Descriptive Analysis, Comparing means(eg. t-Test etc) , Hypothesis testing by using parametric and non parametric tests (eg. CHI square & ANOVA etc) Correlation & Regression analysis, Factor Analysis etc.

Significance of these tools & techniques in Managerial Decision Making.

PH/1002   Computers inResearch   4+0

L	T	P	C
4	4	0	4

Course Objective
1. Develop Proficiency in Computer Tools for Research
2. Utilize Reference Management and Plagiarism Tools
3. Master LaTeX, SPSS, and MATLAB for Research Analysis

Course Outcome: Upon completion of the course students will be able to:
CO 1. Utilize Computer and Internet Tools for Research
CO 2. Manage References and Ensure Academic Integrity
CO 3. Create and Format Documents Using LaTeX
CO 4. Conduct Statistical Analysis Using SPSS
CO 5. Develop Computational Models Using MATLAB

Unit I

BasicsofComputer,UseofComputerinResearch,UseofInternet,GoogleScholar,GooglePatent,Googledatas ettool, GoogleDrive,GoogleForms, GoogleSites

Unit II

ReferenceManagementTool(Zotero,Mendeley,BibTex),Plagiarismtool

Unit III

LaTeX,

InstallationofLaTeX,UnderstandingLatexcompilations,BasicSyntax,writingequations,Matrix,Tables,Figures, Titles, Abstract, Chapters, Sections, References, Equation references, Citation, Bibliography, bibfile,BibTex,Listmakingenvironments,Tableofcontents,Figurehandlingnumbering,Listoffigures,Listoftables

Packages – Geometry, Hyperref, amsmath, amssymb, algorithms, algorithmic graphic, color, tilez listing,cite.Classes – article, book, report

Unit IV

SPSS

Descriptiveanalysis ofdata

Statistical tests - T-test, One-way ANOVA, Non parametric tests, Normality testsCorrelation and regression - Linear correlation and regression, Multiple regression (linear)MultivariateanalysisFactoranalysis, Cluster analysis

UnitV

MATLAB

IntroductiontoMATLAB:Scripts,MakingVariables,ManipulatingVariables,BasicPlottingVisualizationandProgramming:Functions,FlowControl,LinePlots,Image/Surface Plots

SolvingEquations,CurveFitting,andNumericalTechniques:LinearAlgebra,Polynomials,OptimizationDifferentiation/Integration,DifferentialEquations, ProbabilityandStatistics

Text Books&References:

1. Lamport,L.LATEX:adocumentpreparationsystem:user'sguideandreferencemanual.Addison-wesley.
2. WagnerIII,WilliamE. UsingIBM®SPSS®statisticsforresearchmethodsandsocialsciencestatistics.SagePublications.
3. Norusis,M.SPSS 16.0advancedstatisticalprocedurescompanion.Prentice HallPress.
4. Knight,A.BasicsofMATLABandBeyond.ChapmanandHall/CRC.
5. Fausett,L.V.,Fausett,L.V.,Fausett,L.V.,&Fausett,L.V.AppliednumericalanalysisusingMATLAB(Vol. 1). Upper SaddleRiver,NJ::Prenticehall.

PH/1003 ResearchandPublicationEthics 2+0

L	T	P	C
2	2	0	2

Course Objective
1. Understand Fundamental Philosophical and Ethical Concepts
2. Promote Ethical Conduct in Scientific Research
3. Foster Best Practices in Publication Ethics

Course Outcome: Upon completion of the course students will be able to:
CO 1. Define and Understand Philosophical and Ethical Concepts
CO 2. Ensure Scientific Integrity and Identify Misconduct
CO 3. Adhere to Publication Ethics and Standards
CO 4. Utilize Tools and Resources for Open Access Publishing

CO 5. Analyze and Address Publication Misconduct

RPE01:Philosophyand Ethics

Introduction to Philosophy: definition, nature and scope, concept, branchesEthics:Definition,moralphilosophy,natureofmoraljudgmentsandreactions.

RPE02: ScientificConduct

Ethicswithrespect toscienceandresearchIntellectualhonesty andresearchintegrity

Scientific misconducts: Falsification, Fabrication and Plagiarism (FFP)Redundantpublications:duplicateandoverlappingpublications,salamislicingSelectivereporting andmisrepresentation of data

RPE03:PublicationEthics

Publicationethics:definition,introduction andimportance, Bestpractices/standardssettinginitiativesandguidelines:COPE,WAMEetc.Conflicts of interest

Publicationmisconduct:Definition,concept,problemsthatleadtounethicalbehaviorandviceversa,types

Violation of publication ethics, authorship and contributor shipIdentificationofpublicationmisconduct,complaintsandappealsPredatorypublishersandjournals

RPE04:OpenAccessPublishing

Openaccesspublicationsandinitiatives, SHERPA/RoMEO online resource to check publisher copyright & self-archiving policiesSoftware tool to identify predatory publications developed by SPPU: UGC-CARE list of journalsJournal finder/journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer JournalSuggester,etc.

RPE05:PublicationMisconduct

Groupdiscussions, Subjectspecificethicalissues,FFP,authorshipConflicts of interest

Complaintsandappeals:examplesandfraudfromIndiaandabroadSoftwaretools

Use of reference management software like Mendeley, Zotero etc. and anti-plagiarism softwarelikeTurnitin, Urkund. DatabasesIndexingdatabases

Citationdatabases:WebofScience,Scopusetc.ResearchMetrics

Impactfactorofjournalas perJournalCitationReport,SNIP,SJR,IPP,CiteScoreMetrics:h-index, g-index,i-10index, altmetrics

Eligibility to Appear in University Examination:

Such candidates will be allowed to appear in the University examination who satisfy the following requirements:

(a)   Have been on the rolls of Department concerned throughout the semester preceding the examination.

(b)   Have their names submitted to the Head of the Department that their attendance should not be less than 75% of the total lectures delivered in each paper (theory/practical/tutorials/seminars), separately.

EVALUATION PATTERN

i. The UGC 10-point grading system is adopted under CBCS in Usha Martin University. The University adopts the absolute method of grading whereby marks are converted to grades based on pre-determined class intervals. The Table Below provide the details of Letter Grade, Grade Point, Pre-determined class intervals (Range of Marks %); SGPA range and the conventional equivalent in terms of divisions. All calculations of SGPA and CGPA shall be rounded off to two decimal places. In conventional equivalent, the First Division with Distinction is applicable only in case of single attempt else it shall be treated as First Division.

ii Grade Assignment Table: Table illustrating the details and pattern of grading and calculation of

SGPA/CGPA. This Table shall be printed at the back of Consolidated Transcript.

Letter Grade	Merit Remark	Grade Point	Range of Marks (%)	SGPA	Conventional Equivalent
O	Outstanding	10	90.00 – 100.00	9.00 – 10.00	First Division with Distinction
A+	Excellent	9	75.00 – 89.99	7.50 – 8.99	
A	Very Good	8	60.00 – 74.99	6.00 – 7.49	First Division
B+	Good	7	55.00 – 59.99	5.50 – 5.99	Second Division
B	Above Average	6	50.00 – 54.99	5.00 – 5.49	
F	Fail	0	Below 50	< 4.00	Fail
Ab	Absent	0			Ab
F*	Unfair Means	0			F*

Conversion formula: Percentage of Marks = (CGPA) X 10

iii. **Transcript**: Based on the grades earned, a grade certificate shall be issued to all the registered students after every semester. The grade certificate shall display the course details (code, title, no. of credits, grades secured) along with SGPA of that semester and CGPA earned till that semester. The students shall be issued transcript for each semester and a consolidated transcript indicating the performance in all the semesters.

iv. The consolidated report does not reflect the actual percentage of marks scored by the student in a specific examination due to unequal credit values of the papers or the Grade / Grade Points which are assigned for a range marks secured in each paper / course based on ten-point scale. However, to get percentage of marks, multiply the CGPA with 10.

Percentage of Marks = (CGPA) X 10

Declaration of Result:

The Controller of Examinations shall publish a list of candidates who have passed the Ph.D. Course Work examination and issue detailed marks certificate indicating the grades and grade point average (GPA) obtained by the candidate. No degree will be awarded for passing Ph.D. Course Work.

8. **SUBMISSION OF PRE-PH.D. SYNOPSIS PRESENTATION**

Seminar presentation of synopsis will be delivered in the presence of Doctoral Advisory Commitee. If the seminar is satisfactory then candidate will be allowed to register for continue his/her Ph.D. Programme. However, if the DC is not satisfied by the seminar presentation, the candidate will be required to deliver another presentation with suitable modification or improvement within next two months.

Ph.D. programme shall be for a minimum duration of six semesters, including course work and a maximum of twelve semesters. The program duration shall be counted from the beginning of the semester in which the scholar has taken admission. However, in special cases, this limit may be extended to a maximum of fourteen semesters as per decision of committee to be reported to Academic Council. The extension shall be for one semester at a time.

The women candidate and persons with Disability (more than 40% disability) may be allowed a relaxation of four semesters for Ph.D. in the maximum duration. In addition, the women candidates may be provided Maternity Leave/Child care Leave once in the entire duration of Ph.D. for up to 240 days.

9.   DOCTORAL COMMITTEE (DC)

The Doctoral Committee for a scholar in any Department of the UMU shall consist of at least four members as given below:

Head of the concerned Department	Chairperson
The Supervisor and Co-Supervisor/External Supervisor, if any	Member(s)
one faculty members of the Department with Ph.D.degree(related to discipline ofresearch) and one External member outside the university	Members
One expert from the Allied Departments (with Ph.D. degree)	Members

(i) Each DC member should be a full-time faculty member of the UMU holding Ph.D. Degree with at least two publications with NAAS rated more than 5.

(ii) The process of allocation of DC members should be free from all sorts of conflict of interest. (Spouses shall not be members of the same committee and parents shall not be in the DC of their children/relative. The faculty member under whom Supervisor had done Ph.D. shall not be the member of same DC and vice versa.)

(iii) In case, if Chairperson is a Supervisor, another senior member of the Department shall be nominated as the Chairperson of the concerned DC.

FUNCTIONS OF THE DOCTORAL COMMITTEE

(a) After the registration of the scholar for the Ph.D. programme, the Doctoral Committee shall perform the following functions based on the progress report:

Shall make six monthly review of the scholar just after enrollment, in association with the Supervisor and Co- Supervisor and External Supervisor, as may be feasible. The format of the progress report is given in (**Annexure II**).

During Pre-Ph.D. Synopsis presentation as well as every six-monthly progress seminar, a candidate shall submit a document in the prescribed format based on the proposed/progression of work to all DC members during his/her presentation. Every DC member should submit a review report, based on the

proposed/progression of work as well as presentation of the candidate.

(b) Shall forward progress report to the Head of the Department on the progress of scholar's research program along with the reports of individual DC members.

(c) Shall organize a Pre-Ph.D. Submission presentation after completion of the research work of the scholar and verifying the compliance report. The research scholar should submit the complete text of his/her thesis in typed and softbound form and present the seminar.

(d) When scholar submits his/her thesis, the Doctoral Committee in consultation with the Supervisor, after due re-verification of the compliance requirements, shall recommend names of 6 Examiners from reputed Institutions at the level of Associate Professor/Professor/Equivalent, working in the relevant field for the evaluation of the Thesis.

(e) The Thesis (in both hard and soft copy), the recommendation of the Pre-Ph.D. Submission presentation and the list of Examiners will be send by the Chairperson of the DC, to the Controller of Examinations (COE). COE will send the list of Examiners to the Vice-Chancellor of UMU for final recommendation of two examiners for sending the Thesis.

(f) The COE will first take the consent from the Examiners for evaluating the Thesis and after getting the consent, the thesis will be sent to the Examiners. If any Examiner deny to evaluate the thesis, then the COE with consultation with the Vice Chancellor will select another Examiner from the list of Examiners. The Consent Form, Evaluation Report form and Bill of Remuneration for examination of Ph.D. thesis are present in Annexure V, VI and VII respectively.

(g) On receipt of the observations/recommendations of the examiners of the thesis, the COE will send the report to the DC of the scholar. After incorporating the necessary observations/ recommendations the DC shall submit this to the COE for finalizing the date of the Ph. D. Defence and Viva-voce. In the event, if the reports of the examiners are favorable to the scholar as provided, then the Doctoral Committee would also recommend name of the Examiner for conducting the viva voce Board of the scholar. The COE would then send the invitation letter to the Examiner for the conduction of the viva voce of the scholar.

(h) After completion of the Ph.D. Defence and Viva-voce, the final recommendation along with the Hard and Soft copy of Thesis will be send to the COE for declaring the final notification of the award of the Ph.D. degree. Then COE will notify to all the concerned authorities.

10.   **COMPLIANCE REPORT**

Prior to the submission of the thesis, the scholar registered for the Ph.D. Program should have complied with the following requirements:

(a) The research scholar must have carried out the research work for a minimum period of six semesters after his/her registration for Ph.D. program.

(b) The research scholar should have taken and passed the prescribed qualifying examination and course work.

(c) The research scholar must have publications with the minimum criteria as written below:

(i) He /She must have at least two publications in referred journal (Peer Reviewed Journal/Refereed Journal/UGC Care List/Scopus/SCI/SCIE /Web of Science/ patents in the relevant area of research).

(ii) In both the publications, the research scholar should be the first author.

(iii) He /She must have at least two paper presentations in seminars/conferences in national or international level.

(d) The research scholar must have made Pre-Ph.D. Submission presentation of his/her thesis work in the concerned Department of the UMU.

(e) The thesis must be checked with Anti-plagiarism software packages like Turnitin, iThenticate, Ouriginal, etc. and be certified to be 80% free of any plagiarism excluding self-published papers. In addition to that, the thesis must be checked through Grammatical Software.

11.   FORMAT OF THE THESIS

The following format may be normally adopted for the Ph.D. thesis:
1.   Cover page {The cover page of the thesis shall be yellow in color and in the standard format as given in **Annexure IV**
2.   Inner cover page
3.   Declaration by the candidate as per the format given in **Annexure V**, to the effect that the work has not been submitted for any other degree or diploma.
4.   Certificate from the Supervisor, Head of the Department/ Coordinator of the School and Chairman of the DC as per the format given in **Annexure III**.
5.   Contents. {The text in the thesis shall be Times New Roman font size 12, typed on only one side of a page. All figures and Tables shall be appropriate legend.
6.   An Extended Abstract of about 1000 words, describing the research work carried out during the last 5 (Three - Five) years (before the date of submission), on the subject relevant to the discipline in which the candidate has applied for the degree, explaining how far the work is original, exemplary and is contributive to the advancement of knowledge. It shall also summarize the relevance of the publications to the specific subject of the thesis being submitted.
7.   Reprints of the published work by the candidate, in the relevant subject, in the form of research papers, abstracts of books/ monographs, chapter contribution to books/ monographs/ citations of candidate's work by others.
8.   List of publications.
9.   A personal profile of the candidate with photograph, not exceeding one page.

The Layout of the Ph.D. Synopsis
o   Title Page
o   Introduction
o   Review of Literature
o   Materials and Method
o   Work already done
o   References / Bibliography / Literature Cited

THE LAYOUT OF THE Ph.D. THESIS

The Ph.D. thesis should comply with the following specifications
o   Title Page
o   Declaration
o   Certificate
o   Acknowledgements
o   Abbreviations if any
o   Contents

o   List of Tables (where applicable)
o   List of Figures (where applicable)
o   Text of thesis (Chapter scheme may vary depending upon the subject matter/ requirements)
☐   Introduction
☐   Review of Literature
☐   Materials and Method
☐   Result and discussion
☐   Summary and conclusion
☐   References / Bibliography / Literature Cited
☐   Future scope
☐   Appendices (where applicable)

Any other (Reprint of published papers)

12.   SUBMISSION AND EVALUATION OF THESIS

The research scholar has to submit two soft cover binding copies of thesis (one for the concerned Department and another for Examination Department) and one soft copy of the same for evaluation purpose. After evaluation and before viva voce, the research scholar should submit four or five copies (hard cover bound) as required by the Research scholar, Supervisor/Co-Supervisor/External Supervisor, library and departmental library and one soft copy for UGC; after incorporating corrections recommended by the examiners, if any.

The Ph.D. thesis submitted by a research scholar shall be evaluated by his/her Research Supervisor and at least two external examiners who are not in the service of the Usha Martin University. The external examiners should be from recognized universities of repute. The viva-voce examination, based among other things, on the critiques given in the evaluation report, shall be conducted by the research supervisor(s) and at least one of the two external examiners nominated by the University, and shall be open to be attended by members of the DAC/DC, all faculty members of the department, other research scholars and other interested expert/researchers.

If there is lack of unanimity in the recommendations of the Board of Examiners, and if they do not recommend outright rejection of the thesis, the DC may permit resubmission of the thesis after revision within twelve months from the date of the concerned DC meeting. The revised thesis will then be sent to the same set of examiners for their opinion. If, however, any of the previous examiners decline to examine the resubmitted thesis the same will then be sent to another examiner of the previous panel. If the report is still unsatisfactory, the thesis shall be rejected and the research scholar shall be declared ineligible for award of the Ph.D. degree.

If the thesis is not accepted for the award of the Ph.D. degree by one of the external examiners, the DC could recommend that the thesis be sent to another examiner out of the approved panel of examiners of same category and the viva voce examination shall be held only if the report of the latest examiner is satisfactory. If the report of the latest examiner is also unsatisfactory, the thesis shall be rejected and the research scholar shall be declared ineligible for award of the Ph.D. degree.

13.   VIVA VOCE BOARD AND AWARD OF THE Ph.D. DEGREE

A viva-voce Board shall be composed as follows:

(a)   Chairperson (Doctoral Committee)
(b)   External examiner: Member

(c)   All members of the Doctoral Committee: Members

(d)   COE: Observer

The viva-voce Board shall conduct an oral examination of the scholar with a view to test the scholar's insight and power of comprehension in his/her field of research and his/her understanding of the allied fields. The viva-voce Board shall submit its report(s) / recommendation(s) to the Vice-Cancellor. The VC, in turn, will submit the document to the Academic Council which may recommend the award of the Ph.D. degree to the scholar if the recommendations are favorable to the scholar. If, for any reason, the recommendations of the viva voce Board are not favorable to the scholar, he/she will be permitted to appear before the viva-voce Board again, within a period of six months from the date of the previous meeting of the Board.

<div align="center">

Enrollment Form for Ph.D. Programme   *Annexure I*

</div>

Date: _____

The Vice Chancellor

Usha Martin University

Angara, Ranchi – 835103

Dear Sir/Madam,

1. I have been admitted to the Ph.D. Program of the UMU in Department of -- I am enclosing herewith my bio-data for your kind perusal andneedful.

2. My proposed field of research willbe

   (a) Discipline: _____

   (b) Field of Research work:

       _____

   (c) Name of the Supervisor:_____

   (d) Proposed Coursework:

Theory		Term Paper	
Code	Subject	Code	Subject

. .	. .		. .
. .	. .		. .

3. The No Objection Certificate from my organization (for part - time research scholar only) is attached herewith. The certificate for providing the required research facilities by my organization/institution is also attachedherewith.

4. I certify that the particulars given above are correct and I undertaketo

    (a) Abide by the Rules of the UMU during the Ph.D.Program.

    (b) Appear before the relevant Admission Committee whenever directed to doso.

    (c) Take any test or qualifying examinations as specified for the Ph.D.program.

5. The proof of my date of birth, caste (General/OBC/BC/SC/ST) and qualifications are attached.

Thanking You
Yours faithfully,

Signature: _____

Name: _____

Roll No._____

Approved/Recommended/Comments_____

Chairperson(DAC)_____

__SIX MONTHLYPROGRESS REPORT FOR Ph. D STUDENTS__

Progress Report for the Period _____

(1)   Name and Registration Number: _____

(2)   Address:

(3)   Mobile Number:

(4)   Email ID:

(5)   Departments:

(6)   Date of Ph.D Registration:

(7)   Topic Approved for Ph.D:

(8)   Name of the Research Supervisor/s:

(9)   Status of Research: (Progress of the Research in terms of Problem Formulation, Pilot
Study, Field Work, Experimentation, Data Collection, Data Analysis, Report Writing,
etc. Please – use additional sheet, if required)

_____
_____
_____

(10)   Details of Course Work undertaken

(i) Courses Completed with Credits With Course Work:

(11)   Participation in seminars, conferences during the period under report- use additional sheet, if
required

_____

_____
_____

(12) Presentation of papers in seminars/conferences during the period under report- use additional
      sheet, if required

      _____
      _____

(13) Publications during the period- use additional sheet, if required:

(14) Details of Books/Research Papers consulted - use additional sheet, if required:

      _____
      _____
      _____

(15) Any other special contribution by the researcher to the institution during the period under report-
      use additional sheet, if required:

      _____
      _____

OBSERVATIONS OF THE SUPERVISOR (including on the research aptitude of the candidate):

Evaluation of the Progress of the Researcher:

Progress is Very Good/Good/Satisfactory/Needs improvement

Date: **Research Supervisor**

Observations of the Head of the Departments

Approval of the Supervisor(s)

Recommendedthatthe thesis entitled "---"
prepared by Mr/Ms/Mrs ……………………… under my/our supervision and guidance be
accepted in partial fulfillment of the requirements for the degree of Doctor ofPhilosophy.

To the best of my/our knowledge, the contents of this thesis did not form a basis for the award of
any previous degree to anybody else.

Date:

Format of Cover Page

Margins

Top: 1.25",Bott: 80.36"

Left:1.5", Right: 1"

1.5 Line spacing throughout

18, Arial Black

Bold Upper Case

1 Blank Lines,14Font

22, MonotypeCorsiva

14, Arial, Bold,Italics

16, Arial Black, Bold

1 Blank Lines, 14 Font
1" x 1" Logo

PLEASE MENTION TITLE OF THE THESIS

A Thesis

SUBMITTED TO

USHA MARTIN UNIVERSITY

FOR AWARD OF
THE DEGREE OF DOCTOR OF PHILOSOPHY

By

NAME OF THE RESEARCH SCHOLAR

NAME OF THE DEPARTMENT

CANDIDATE'S DECLARATION

I, …..………………, declare that this thesis, entitled "………………… ," submitted for the award of
(Name of the Candidate)   (Title of the thesis)

the degree of ……………….…………………. of this University, has not been submitted earlier for the award of any
(Name of the Degree)

degree or diploma of this or any other University.

Date: ……………..   (Signature of the candidate)

Place: