DEPARTMENT OF HIGHER EDUCATION

RAJA MAHENDRA PRATAP SINGH UNIVERSITY, ALIGARH

AS PER THE ICAR-Sixth Deans' Committee

Course Curriculum of M.Sc. (Ag.) Extension

Course Curriculum of M.Sc. Ag. Extension
(Based on Restructured and Revised Syllabi of PG Programme by ICAR)

1st Semester			Evaluation Marks			
Code No.	**Course Title**	**Credit Hours**	**Mid Term (Internal)**	**Practical (External)/ Assignment (Internal 2)**	**End term/Final (External)**	**Total**
EXT- 501	Global Extension Systems	3(3+0)	40	10	50	100
EXT- 502	ICT and New Media	3(1+2)	20	30	50	100
EXT-503	Dynamic Communication Skills	3(1+2)	20	30	50	100
	Elective	3(2+1)	20	30	50	100
AST 501	Experimental Design	3(2+1)	20	30	50	100
PGS 501	Basic Concepts in Laboratory Technique	1(0+1)	40	10	-	50
PGS 502	Intellectual Property and Its Management in Agriculture	1(1+0)	-	-	50	50
	Total Credit	**17**				**600**
2nd Semester			**Evaluation Marks**			
EXT- 504	Technology Transfer and Management	3(2+1)	20	30	50	100
EXT- 505	Climate change Management	3(2+1)	20	30	50	100
EXT- 506	Educational Technology	2(1+1)	20	30	50	100
	Elective	3(2+1)	20	30	50	100
AST 502	Date Analysis Using Statistical Packages	3(2+1)	20	30	50	100
PGS 503	Agriculture Research, Research Ethic and Rural Development Programmes	1(1+0)	-	-	50	50
PGS 504	Library and Information Services	1(0+1)	40	10	-	50
	Total Credit	**16**				**600**
3rd Semester			**Evaluation Marks**			
EXT- 507	Group Dynamics	2(2+0)	40	10	50	100
EXT- 508	Gender Sensitization for Empowerment	3(2+1)	20	30	50	100
EXT- 509	Community Development and Outreach	3(2+1)	20	30	50	100
	Elective	2(1+1)	20	30	50	100
PGS-505	Technical Writing and Communications Skills	1(0+1)	-	100	-	100
	Total Credit	**11**				**500**

4th Semester			Evaluation Marks			
EXT-511	Master Seminar	1(0+1)	-	100	-	100
EXT- 511 A	Master Research (Thesis)	30	Satisfactory/Unsatisfactory			
OR						
EXT- 511 B	IDEA (Internship for development of Entrepreneurship in Agriculture)	30	Satisfactory/Unsatisfactory			
	Total	**1+30**				**100**
	Grand total credit hours	**45+30=75**				**1800**

M.Sc. (Ag.) Extension

The following nomenclature and Credit Hrs. are following while structuring Syllabus:

A. Course Work	Course Code	Allotted Credit Hours
1. Major Course	EXT- 501 To EXT- 509	25
2. Minor Course	Elective	08
3. Supporting Course	AST-501 & AST-502	06
4. Common Course	PGS-501 To PGS-505	05
5. Seminar	EXT- 510	01
B. 1.Thesis Research/ IDEA	Master Research or IDEA	30
Total		**75**

List of Minor Papers for Other Departments

Sr. No.	Course Code	Course Name	Allotted Credit Hours	Sem.
1	EXT- 501	Global Extension Systems	3(3+0)	1st
2	EXT- 504	Technology Transfer and Management	3(2+1)	2nd
3	EXT- 507	Group Dynamics	2(2+0)	3rd

Note: - 1. The student has to opt. Minor Courses of Minimum 8 credit hours offer by another department

2. The first course of every semester from the respective department is treated as a Minor for other department.

1st Semester

(EXT-501) Global Extension Systems 3(3+0)

Theory

Unit I: Orientation to extension systems

Early extension efforts; Indian extension systems - reforms, challenges of extension management in India; Paradigm shift in extension systems; Extension approaches in view of globalization and market liberalization; Privatization of extension services – introduction, scope, advantages, limitations and experiences; Decentralization of extension systems; Revolution in extension systems.

Unit II: Governance and extension systems

Indian governance and role of extension systems - retrospection on Indian governance; Role of extension system; Ministries - rural development, agriculture, science and technology, human resource development, health, industries, education and women and child development; NGO collaboration; Review of five-year plans.

Unit III: ICAR extension system

History; Extension system; Organizational structure; Policy issues; Existing extension systems and challenges; National and regional institutions - vision, objectives, activities, innovations, programmes; Extension systems in SAUs - organizational structure, personnel, roles, innovations, SWOT analysis.

Unit IV: Extension management and training organizations and institutions

FAO, IFAD, IFRI, WFO, WHO, *Biodiversity international,* MANAGE, NIRD, National Institute of Agricultural Marketing (NIAM), NAARM, EEI, SAMETI, FTC.

Unit V: Extension management and training organizations and counties

India with USA, UK, Israel, China, Pakistan, Bangladesh, Japan, Italy, South Africa, Island, Indonesia, Philippines and Brazil - history, approaches, organizational structure, methodology, services, problems and research linkages

Suggested Reading

- Azadi H and Filson G. 2009. *Comparative Study of Agricultural Extension Systems-A Systemic View Outlook on Agriculture*. https://www.rug.nl/research/portal/publications.
- Sagar M. 2013. *Text Book of Agricultural Extension with Global Innovations*. Kalyani Publishers, Ludhiana, ISBN: 978-93-272-2877-9.
- Salahuddin A and Magor NP. 2005. *Innovations in Rural Extension: Case Studies from Bangladesh*. CABI Publishing, Wallingford, UK.
- Sangeet G and Mithilesh V. 2011. *Global Extension Systems: A Textbook*. New Academic Publications ISBN-10: 8186772464 ISBN-13: 978-8186772461.
- Singh KK *et al.* 2015. *Agricultural Extension Explorer*. Kalyani Publishers, Ludhiana.
- *Global Approaches to Extension Practice: A Journal of Agricultural Extension*
- *International Journal of Agricultural Extension*
- *Indian Research Journal of Extension Education* published by Society for Extension Education Agra

(EXT-502) ICT and New Media 3(1+2)

Theory

Unit I: Information communication technology

Information communication technology - components of ICT, role of ICT in community education; IT enabled services - call center, helpdesks, data warehouse; Current status of application; Government policy on ICT; Emerging research issues.

Unit II: Perspective of new media

Definitions, Soft and hardware components, Traditional media transition to new media; Knowledge management and archiving; Networks; Social Media - advantages and limitations.

Unit III: Perspective of new media

Digital Audio - sound design and mixing, digital videography and photography, digital text writing.

Unit IV: Web and blog designing

Hosting; Introduction of HTML and basic tags and HTML document structure; Cascading style sheets; Text in CSS and working.

I. Practical

1. Multimedia and emerging technologies - Introduction to Video-on demand, internet - radio and web television
2. Introduction to Internet and the browsers
3. Introduction to Internet access and browsing
4. Introduction to Internet access and browsing extension related websites, blogs and data bases
5. Exposure to network
6. Compose e-mails, send and receive mails
7. Video on demand- different video formats
8. Creating a Basic Video Clips with Video Editing software.
9. Adding audio into developed videos
10. Editing of existing videos and audios
11. Video on demand-accessing downloads and editing of required video formats
12. Internet radio- Accessing different radio channels in online websites and browsing
13. Web Television- Exposure and accessing
14. Impact of new media on traditional media- listing of various traditional media and new media formats- collection of literature
15. Group discussion/debate on advantages and disadvantages of traditional media and new media
16. Writing on specialized area on the web
17. Writing for general interest web- script writing concepts, principles for web
18. Writing for online- script writing concepts, principles, styles for online
19. Writing for net newspapers and editions- script writing concepts, principles, styles for online
20. Writing for blogs and search engines- script writing concepts, principles, styles for online
21. Writing for video logs, citizen journalism- script writing concepts, principles, styles for online
22. Evaluation of e-journals- Exposure to electronic journals, browsing sites, accessing and down loading the journal articles
23. Evaluation of e-journals
24. Submission of reports
25. Unique features of web language-, open source software's, viz., word press, joomla, moodle
26. Introduction and basics to Advanced HTML
27. Introduction of Cascading Style Sheets
28. Orientation – java script and HTML scripts
29. Designing web page- Home page(landing page), hyperlinks with using CSS
30. Practical exercise on designing a web page by using HTML5 and CSS3.
31. How to create responsive (Mobile friendly) Pages with Using HTML5 and CSS3.
32. Designing web page- Home page, hyperlinks - open source softwares, viz., Wordpress
33. Explanation of WordPress Dashboard and creating blog in Wordpress
34. Hosting a WordPress Blog online
35. Creating Google Analytics
36. Adding Google Analytics into HTML page and Wordpress Pages
37. Introduction to interactive web media- web animation
38. Understanding web animation- jquery, dream weaver and Photoshop
39. Exposure to animated graphics in the web
40. Introduction to designing interactive elements, sound addition
41. Introduction to web visual editor, creation and editing.
42. Acquiring a domain and webhosting to host the website/blog.
43. Familiarisation with FTP and Cpanel
44. Hosting website into Online
45. Updating/change the contents and images online Website after Hosting.
46. How to take the backups of the website after hosting a website.
47. Tracking Web Traffic from Analytics
48. End term assessment

(EXT-503) Dynamic Communication Skills 3(1+2)

Theory

Unit I: Introduction to technology transfer

Transfer of Technology - Definition and importance; Models of technology transfer different models, qualitative technology transfer models, dimensions of technology transfer, features of technology package, routes of technology transfer; FLD, OFT, Mini kits.

Unit II: Technology acquisition

Technology acquisition; Alternatives for acquiring new technologies; Reasons; Management of acquired technology; Measures of scale and mechanisms for acquiring technologies - economy of scale, levels of scale, measurement of scale, factors affecting the choice of scale.

Unit III: Introduction to technology management

Concept and meaning of technology management; Evolution and growth of technology management.

Unit IV: Role and significance of technology management

Impact of technology on society; Technology and competition; Key issues in managing technological innovation, Forms of technology - product and process technologies; Technology forecasting - methods and principles; Role of government in technology management.

Unit V: Technological change

Characteristics of technological change; Classification of technological change; Impact of technological change; Technology life cycle; Technology transformation; Technology policies and policy instruments. Technology assessment Technology choice; Technology assessment and refinement; Technology assessment process; Technology leadership and followership; Writing technology assessment report. Meaning and differences; Innovation management; Intellectual property management.

Practical

Note: Students may be attached to AICRP on Home Science/ Research project all through the semester for practical experience with either one of the departments, or for a stipulated duration with every department may be left to the discretion of course-in-charge. Students' report may consist the following information.

1. Enlisting of technologies already transferred under five disciplines/ research project.
2. Selection of technologies for observation of change attained and preparation of observation schedule
3. Field visit and interaction with clientele to collect data
4. Analysis of data and preparation of report
5. Presentation of report
6. Group discussion on technology refinement/ sustainability issues
7. Enlisting and description of technologies transferred by the concerned scientist/s during the semester
8. Description of invention, innovation and creativity of the selected technology
9. Description of transfer of technology model
10. Design and development of transfer of technology process
11. Presentation of technology transfer process
12. Preparation and finalisation of work plan for participation in technology transfer
13. 13–25. Execution of work plan as per time line
14. 26-27 Analysis of technology adoption and diffusion stages
28. Preparation of report on technology transfer
29. Presentation of report
30. End term assessment

(AST 501) Experimental Designs 3(2+1)

Theory Unit I

Need for designing of experiments, characteristics of a good design. Basic principles of designs-randomization, replication and local control.

Unit II

Uniformity trials, size and shape of plots and blocks, Analysis of variance, completely randomized design, randomized block design and Latin square design.

Unit III

Factorial experiments, (symmetrical as well as asymmetrical). orthogonality and partitioning of degrees of freedom. Concept of confounding.

Unit IV

Split plot and strip plot designs, analysis of covariance and missing plot techniques in randomized block and Latin square designs; Transformations, Balanced Incomplete Block Design, resolvable designs and their applications,

Unit V

Lattice design, alpha design - concepts, randomization procedure, analysis and interpretation of results. Response surfaces. Combined analysis.

Practical

- Uniformity trial data analysis, formation of plots and blocks, Fairfield Smith Law, Analysis of data obtained from CRD, RBD, LSD, Analysis of factorial experiments,
- Analysis with missing data,
- Split plot and strip plot designs.

Suggested Reading

- Cochran WG and Cox GM. 1957. *Experimental Designs*. 2nd Ed. John Wiley.
- Dean AM and Voss D. 1999. *Design and Analysis of Experiments*. Springer.
- Montgomery DC. 2012. *Design and Analysis of Experiments*, 8th Ed. John Wiley.
- Federer WT. 1985. *Experimental Designs*. MacMillan.
- Fisher RA. 1953. *Design and Analysis of Experiments*. Oliver & Boyd.
- Nigam AK and Gupta VK. 1979. *Handbook on Analysis of Agricultural Experiments*. IASRI Publ.
- Pearce SC. 1983. *The Agricultural Field Experiment: A Statistical Examination of Theory and Practice*. John Wiley.
- www.drs.icar.gov.in.

(PGS 501) BASIC CONCEPTS IN LABORATORY TECHNIQUES 1(0+1)

Practical

- Safety measures while in Lab;
- Handling of chemical substances;
- Use of burettes, pipettes, measuring cylinders, flasks, separatory funnel, condensers, micropipettes and vaccupets;
- Washing, drying and sterilization of glassware;
- Drying of solvents/ chemicals;
- Weighing and preparation of solutions of different strengths and their dilution;
- Handling techniques of solutions;
- Preparation of different agro-chemical doses in field and pot applications;
- Preparation of solutions of acids;
- Neutralization of acid and bases;
- Preparation of buffers of different strengths and pH values;
- Use and handling of microscope, laminar flow, vacuum pumps, viscometer, thermometer, magnetic stirrer, micro-ovens, incubators, sandbath, waterbath, oilbath

- Electric wiring and earthing;
- Preparation of media and methods of sterilization;
- Seed viability testing, testing of pollen viability;
- Tissue culture of crop plants;
- Description of flowering plants in botanical terms in relation to taxonomy.

Suggested Readings

- Furr AK. 2000. *CRC Hand Book of Laboratory Safety*. CRC Press
- Gabb MH and Latchem WE. 1968. *A Handbook of Laboratory Solutions*. Chemical Publ. Co.

(PGS 502) Intellectual Property and Its Management In Agriculture 1(1+0)

Theory

Historical perspectives and need for the introduction of Intellectual Property Right regime; TRIPs and various provisions in TRIPS Agreement; Intellectual Property and Intellectual Property Rights (IPR), benefits of securing IPRs; Indian Legislations for the protection of various types of Intellectual Properties; Fundamentals of patents, copyrights, geographical indications, designs and layout, trade secrets and traditional knowledge, trademarks, protection of plant varieties and farmers' rights and biodiversity protection; Protectable subject matters, protection in biotechnology, protection of other biological materials, ownership and period of protection; National Biodiversity protection initiatives; Convention on Biological Diversity; International Treaty on Plant Genetic Resources for Food and Agriculture; Licensing of technologies, Material transfer agreements, Research collaboration Agreement, License Agreement.

Suggested Readings

- Erbisch FH and Maredia K.1998. *Intellectual Property Rights in Agricultural Biotechnology*. CABI.
- Ganguli P. 2001. *Intellectual Property Rights: Unleashing Knowledge Economy*. McGraw-Hill.
- *Intellectual Property Rights: Key to New Wealth Generation*. 2001. NRDC and Aesthetic Technologies.
- Ministry of Agriculture, Government of India. 2004. *State of Indian Farmer*. Vol. V.Technology Generation and IPR Issues. Academic Foundation.
- Rothschild M and Scott N. (Ed.). 2003. *Intellectual Property Rights in Animal Breeding and Genetics*. CABI.
- Saha R. (Ed.). 2006. *Intellectual Property Rights in NAM and Other Developing Countries: A Compendium on Law and Policies*. Daya Publ. House.

2nd Semester

(EXT-504) Technology Transfer and Management 3(2+1)

Theory

Unit I: Introduction to technology transfer

Transfer of Technology - Definition and importance; Models of technology transfer - different models, qualitative technology transfer models, dimensions of technology transfer, features of technology package, routes of technology transfer; FLD, OFT, Mini kits. Technology adoption diffusion and absorption; Role of technology absorption - benefits, constraints in technology absorption, technology package and technological dependence, Indian experience in technology absorption efforts, issues involved in the management of technology absorption and government initiatives.

Unit II: Technology acquisition

Technology acquisition; Alternatives for acquiring new technologies; Reasons; Management of acquired technology; Measures of scale and mechanisms for acquiring technologies - economy of scale, levels of scale, measurement of scale, factors affecting the choice of scale.

Unit III: Introduction to technology management

Concept and meaning of technology management; Evolution and growth of technology management. Meaning and differences; Innovation management; Intellectual property management

Unit IV: Role and significance of technology management

Impact of technology on society; Technology and competition; Key issues in managing technological innovation, Forms of technology - product and process technologies; Technology forecasting - methods and principles; Role of government in technology management.

Unit V: Technological change

Characteristics of technological change; Classification of technological change; Impact of technological change; Technology life cycle; Technology transformation; Technology policies and policy instruments. Technology assessment Technology choice; Technology assessment and refinement; Technology assessment process; Technology leadership and followership; Writing technology assessment report.

Development process and steps; Technology development and competition; Managing research & development (R & D); Reforms in technology development.

Practical

Note: Students may be attached to AICRP on Home Science/ Research project all through the semester for practical experience with either one of the departments, or for a stipulated duration with every department may be left to the discretion of course-in-charge. Students' report may consist the following information.

- Selection of technologies for observation of change attained and preparation of observation schedule
- Field visit and interaction with clientele to collect data
- Analysis of data and preparation of report
- Presentation of report
- Group discussion on technology refinement/ sustainability issues
- Enlisting and description of technologies transferred by the concerned scientist/s during the semester
- Description of invention, innovation and creativity of the selected technology
- Description of transfer of technology model
- Design and development of transfer of technology process
- Presentation of technology transfer process
- Preparation and finalisation of work plan for participation in technology transfer 13–25. Execution of work plan as per time line
- Analysis of technology adoption and diffusion stages
- Preparation of report on technology transfer
- Presentation of report
- End term assessment

Suggested Reading

- A Inzelt and Jan Hilton. 1999. *Technology Transfer: From Invention to Innovation*. Springer Science and Business Media, Kluwer academic publishers.
- Albert E Muir. 1997. *The Technology Transfer System*: *Inventions: Marketing, Licensing, Patenting, Setting, Practice, Management, Policy*. Book News, Inc., Portland.
- Ali Hussein Saleh Zolai. 2012. *Knowledge and Technology Adoption, Diffusion, and Transfer*: *International Perspective.* University of Bahrain, Bahrain ISBN13: 9781466617520.
- Avid B, Audretsch Erik E, Lehmann Albert N, Link Alexander Starnecker. 2012. *Technology Transfer in a Global Economy*. Springer Science & Business Media, ISBN 146146102.
- Thomas J Allen. 1984. *Managing the Flow of Technology*. Edition III, Massachusetts Institute of Technology, ISBN 0262510278.
- *International Journal of Technology Transfer and Commercialisation*. Interscience Publishers, Genèva.

(EXT-505) Climate Change Management 3(2+1)

Theory

Unit I: Basics of climate and climate change

Introduction to climate and climate change - Definition and meaning; Climate change classification; Method of classification; General concept of environmental Science; Natural and manmade causes of climate change; Affects for climate change; Consequences risks and uncertainty of climate change; Climate system; Major predictions.

Unit II: Greenhouse gases and global warming

Major greenhouse gases and sources; Global warming effect and causes, Responses to global warming; Different views on greenhouse gases and global warming natural resource management; Solid waste management; Biodiversity; Alternative livelihood security; Drought prone technologies.

Unit III: Climate change Impacts

Impacts on biodiversity - wetland, forest, agriculture, transportation, coastal area, water resources; Global, National and regional impacts; Vulnerability assessment; Climate modelling.

Unit IV: Climate change policy

Introduction; Various policies in India; National action plan; Sector specific policies and policies instruments; Environment impact assessment; Environment planning and management; Climate resilient technology.

Unit V: Climate change communication

Introduction - definition, perspectives and importance; Engaging climate change communication; Audiences; Frames; Values and Norms.Theories of visual perception; Classification and selection of visuals.National international advocacy groups and organizations; Strategies and programmes.Media; Scientific Experts; Policymakers; and academic institutions on climate change communication.

Practical

1-4. Visit to Climate management organization to understand strategies and observe the impacts

5. Identification of climate management needs at home level and development of suitable technology - Apparel and textiles
6. Identification of climate management needs at home level and development of suitable technology - Food and Nutrition
7. Identification of climate management needs at home level and development of suitable technology - General health
8. Identification of climate management needs at home level and development of suitable technology - domestic appliances and arrangements
9. Identification of climate management needs and development of suitable technology- Children and senior citizens.
10. Identification of climate management needs and development of suitable technology- differently able
11. Preparation of climate communication media – print
12. Preparation of climate communication media – radio
13. Preparation of climate communication media – video
14. Preparation of climate communication media – blog/web writing
15. Exhibition on climate change management
16. End term assessment

Suggested Reading

- Gopal B. 2004. *Global Warming and Climate Changes: Transparency and Accountability*. 3 ISBN-10: 8182050782 ISBN-13: 978-8182050785
- Kandarp TP and Vaishnav. 2018. *Climate Change Solutions, Global Warming Solutions and Innovative Ideas for Construction of World Development*. Notion Press; 1 edition ISBN- 10: 1643241818 ISBN-13: 978-1643241814
- Lenka S and Lenka NK. 2013. *Climate Change and Natural Resources Management*. New India Publishing Agency SBN-10: 9789381450673 ISBN-13: 978-9381450673
- Mark M. 2009. *Global Warming: A Very Short Introduction*. ISBN-10: 0199548242 ISBN- 13: 978-0199548248 http://envfor.nic.in/e-books
- *Climate Change: Impacts, Vulnerabilities and Adaptat.ion in Developing Countries.* https://unfccc.int/resource/docs/publications/impacts.pdf

(EXT-506) Educational Technology 2(1+1)

Theory

Unit I: Overview of educational technology

Meaning; Concepts and scope of educational technology; Curriculum design and development; Lesson planning; Concept and methodology; Modularized instruction - fundamentals, process, formulation of objectives, selection of media, field testing and evaluation of module.

Unit II: Teaching learning process

Meaning and characteristics of teaching and learning; Maxims of teaching - stages, forms and levels of teaching and learning; Motivation - concept, importance and techniques; Teaching styles - expert, formal authority, personal model, facilitator, delegator; Learning Styles - visual, aural, read/write, kinesthetic (VARK).

Unit III: Teaching learning strategies

Microteaching; Programmed instruction; Simulation role-play; Team teaching; Experiential learning; Traditional media; ICT Applications in education; Multimedia based teaching and learning.

Genesis and trends; Management of formal and non-formal education in India; Vocationalization of education; Distance education; Guidance and counselling; Innovative instructional aids - web instruction, e-learning, virtual laboratories.

Unit V: Educational technology for differently able

Visual impaired script - advances in braille; Hearing impaired - advances in Indian sign language; People with special needs - educational programmes and government policies.

Practical

1. Identification of key terms in educational technology and preparation of directory
2. Critical analysis of UG and PG curriculum of Community Science in relation to course objectives
3. Research review on planning and implementation of lesson planning
4. Presentation of research review report
5. Preparation of lesson plan
6. Conducting class as per lesson plan and self and peer evaluation
7. Preparation of inventory for identification of teaching styles and execution
8. Preparation and presentation of report
9. Preparation of inventory for identification of learning styles and execution
10. Preparation and presentation of report
11. Construction of Objective questions- Multiple choice, fill in the blanks
12. Construction of competency based question paper- Matching, Technical terms
13. Construction of subjective questions- Short type
14. Construction of subjective questions- Essay type
15. Analysis of questions in terms competency evaluation- knowledge, memory, application, analysis
16. End term assessment
17. Prepare and execute inventory to identify learning styles
18. Construct competency based objective and subjective question papers

I. Suggested Reading

- Dahama OP and Bhatnagar OP. 2005. *Education and Communication for Development*. Oxford & IBH.
- Bhaviskar SG. 2006. *Modern Technology in Education.* Kalyani Publication, New Delhi.
- Suhaskumar and Ruprao P *Modern Trends in Curriculum Organization.* Kalyani Publication, New Delhi.
- Heidi HJ. 2010. *Curriculum Essential Education for a Changing World.*
- Kochhar SK. 1985. *Methods and Techniques of Teaching*. Sterling Publication.
- Ray GL. 2006. *Extension Communication and Management*. Kalyani Publication, New Delhi.
- Anita S *Encyclopaedia of Curriculum Reforms and New Teaching Methods* (*4 Vol. Se*t). Dominant Publishers and distributors, New Delhi.
- The International Journal of Educational Technology in Higher Education
- *International Journal of Educational Technology* (ISSN 2476-0730)

(AST 502) Data Analysis Using Statistical Packages 3(2+1)

Theory

Unit I

Introduction to various statistical packages: Excel, R, SAS, SPSS. Data Preparation; Descriptive statistics; Graphical representation of data, Exploratory data analysis.

Unit II

Test for normality; Testing of hypothesis using chi-square, t and F statistics and-Ztest.

Unit III

Data preparation for ANOVA and ANCOVA, Factorial Experiments, contrast analysis, multiple comparisons, Analyzing crossed and nested classified designs.

Unit IV

Analysis of mixed models; Estimation of variance components; Correlation and regression analysis, Probit, Logit and Tobit Models.

Unit V

Discriminant function; Factor analysis; Principal component analysis; Analysis of time series data, Fitting of non-linear models; Neural networks.

Practical

- Use of software packages for summarization and tabulation of data, obtaining descriptive statistics, graphical representation of data
- 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;
- Designs for Factorial Experiments, fixed effect models, random effect models, mixed
- effect models, estimation of variance components;
- Linear regression, Multiple regression, Regression plots
- Discriminant analysis - fitting of discriminant functions, identification of important
- variables
- Factor analysis. Principal component analysis - obtaining principal component.

Suggested Reading

- Anderson C.W. and Loynes R.M. 1987. The Teaching of Practical Statistics. John Wiley.
- Atkinson A.C. 1985. Plots Transformations and Regression. Oxford University Press.
- Chambers J.M., Cleveland W.S., Kleiner B and Tukey P.A. 1983. Graphical Methods for Data Analysis. Wadsworth, Belmont, California.
- Chatfield C. 1983. Statistics for Technology. 3rd Ed. Chapman & Hall. Chatfield C. 1995. Problem Solving: A Statistician's Guide. Chapman & Hall.
- Cleveland W.S. 1985. The Elements of Graphing Data. Wadsworth, Belmont, California.
- Ehrenberg ASC. 1982. A Primer in Data Reduction. John Wiley.
- Erickson B.H. and Nosan Chuk T.A. 1992. Understanding Data. 2nd Ed. Open University Press, Milton Keynes.
- Snell E.J. and Simpson HR. 1991. Applied Statistics: A Handbook of GENSTAT Analyses. Chapman and 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 and 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.

(PGS 503)- Agricultural Research, Research Ethics and Rural Development Programmes 1 (1+0)

Theory:

UNIT I

History of agriculture in brief; Global agricultural research system: need, scope, opportunities; Role in promoting food security, reducing poverty and protecting the environment; National Agricultural Research Systems (NARS) and Regional Agricultural Research Institutions;

UNIT II

Consultative Group on International Agricultural Research (CGIAR): International Agricultural Research Centers (IARC), partnership with NARS, role as a partner in the global agricultural research system, strengthening capacities at national and regional levels; International fellowships for scientific mobility.

UNIT III

Research ethics: research integrity, research safety in laboratories, welfare of animals used in research, computer ethics, standards and problems in research ethics.

UNIT IV

Concept and connotations of rural development, rural development policies and strategies. Rural development Programmes: Community Development Programme, Intensive Agricultural District Programme, Special group – Area Specific Programme, Integrated Rural Development Programme (IRDP) Panchayati-Raj Institutions, Co-operatives, Voluntary Agencies/ Non-Governmental Organizations.

UNIT V

Critical evaluation of rural development policies and Programmes. Constraints in implementation of rural policies and Programmes.

Suggested Readings

- Bhalla GS and Singh G. 2001. Indian Agriculture - Four Decades of Development. Sage Publ.
- Punia MS. Manual on International Research and Research Ethics. CCS Haryana Agricultural University, Hisar.
- Rao BSV. 2007. Rural Development Strategies and Role of Institutions - Issues, Innovations and Initiatives. Mittal Publ.
- Singh K. 1998. Rural Development - Principles, Policies and Management. Sage Publ
- .

(PGS 504)-Library and Information Services 1(0+1)

Practical

Introduction to library and its services; Role of libraries in education, research and technology transfer; Classification systems and organization of library; Sources of information- Primary Sources, Secondary Sources and Tertiary Sources; Intricacies of abstracting and indexing services (Science Citation Index, Biological Abstracts, Chemical Abstracts, CABI Abstracts, etc.); Tracing information from reference sources; Literature survey; Citation techniques/ Preparation of bibliography; Use of CD-ROM Databases, Online Public Access Catalogue and other computerized library services; Use of Internet including search engines and its resources; eresourcesaccess methods.

3rd Semester

(EXT-507) Group Dynamic 2(2+0)

Theory

Unit I:

Introduction to group and group dynamics Meaning; Characteristics; Types and functions of groups; Stages and process of group formation; Group norms and structure; Values; Ethics; and Morals.

Unit II:

Understanding group behavior Definitions; Theories - social comparison, cognitive dissonance, self-presentation, drive, social impact, self-attention, social cognition theories; Individual; Interpersonal and human behavior and dimensions.

Unit III:

Group dynamics Cooperation; Competition; Communication; Group pressure; Group cohesiveness; Group leadership; Measurement of group dynamics - tools and techniques; Group break down - causes and solutions; Strengths; Weaknesses and myths; Crowds and the mob mentality; Diversity and difference; Group dynamic skills - training and development.

Unit IV:

Managing group Team building; Conflict management; Stress management; Active listening and feedback; Achieving cooperative group structure.

Unit V:

Understanding collective action in groups Collective action meaning; Theories and applications; Incentives for collective action; Research reviews on collective action for sustainable group dynamics.

Suggested Reading

• Ernest S and Sharon AR. 1985. Effective Group Communication- How to Get Action by Working in Groups. National Textbook Company, Lincolnwood. • George RG. 2011. Chapter on Theories of Group Behavior: Commentary.

• Mary AG and Hennen. 2009. Stages of Group Development. Shared by Extension Center for Community Vitality, 10-21-14.

• Mary S. 2010. Book of Conflict Resolution Games Quick, Effective Activities to Improve Communication, Trust, and Collaboration. ISBN: 978-0-07-174366-2.

• Smith GE. 2001. Group Development: A Review of Literature and A Commentary on Future Research Directions. Group Facilitation.

• Susan WA. 2005. Facilitating Group Communication. The Handbook of Group Research and Practice, Sage Publications, Inc, Thousand Oaks.

• Vanni F. 2014. The Role of Collective Action. Agriculture and Public Goods, 21. DOI 10.1007/ 978-94-007-7457-5_2, © Springer Science +Business Media Dordrecht.

• Managing Stress. 2010. MTD Training and Ventus publication Aps. ISBN-978-87-7681-658- 2. https://www.mindtools.com/pages/article/newTMM_79.htm

(EXT-508) Gender Sensitization for Empowerment 3(2+1)

Theory

Unit I:

Overview of gender Concept; Meaning and related terms; Gender sensitization - concept, meaning and importance of gender sensitization; Gender and empowerment - meaning, definitions and need; Gender issues in home - community and organization.

Unit II:

Gender issues Gender issues and challenges in development; Understanding gender and subordination of women; Gender as a development tool; Policy approaches for women development; Gender perspectives in development of women - roles, responsibilities, access and control over resources, constraints and opportunities.

Unit III:

Gender tool kit for assessment of gender empowerment Gender budgeting and gender analysis framework - context, activities, resources and Programme action profile; Concept of GDI, GEM, GSI; National and regional indicators.

Unit IV:

Gender issues and development National policy for empowerment of women since independence; Interventions to enhance women's empowerment at individual; Community and national level;

Unit V:

Livelihood implications of gender - health and nutrition, agriculture, violence, governance, education, media and legal issues.

Practical

1. Simulation role play to understand sex and gender, gender blind: gender aware: gender sensitive: gender equity.
2. Critical analysis of status of women in different sectors
3. Presentation of reports
4. Public speaking on Gender issues- Gender mainstreaming
5. Public speaking on Gender issues- Drudgery
6. Public speaking on Gender issues- Agriculture and allied sectors
7. Public speaking on Gender issues- Health and Nutrition
8. Public speaking on Gender issues- Business and Enterprise
9. Public speaking on Gender issues- Politics and Public administration
10. Preparation of case studies on selected issues/personalities
11. Gender sensitive interventions in SAUs and their objectives and frame work
12. Critical analysis of selected interventions and projects in operation
13. Preparation of report
14. Presentation of report

(EXT-509) Community Development and Outreach 3(2+1)

Theory

Unit I: Community development Definition; Issues and concepts; Historical perspective of community development in India and emerged changes since inception to current era.

Unit II:

Approaches Approaches - concept and characteristic features gandhian approach, community development approach, sectoral approach, target approach, area approach, minimum need approach, integrated or holistic approach, participatory development approach; Strategies - multipurpose strategy, growth oriented strategy and spatial planning strategy; The modernization theory; Human development model (components, HDI, ranking, gender related development index, HPI)

Unit III:

Key principles of community development Community participation - definition and scope; Inclusion; Equality; Collective action; Empowerment and community development process; Provision of information; Identification of felt needs and common issues; Consultation for Shared vision; Mobilization for action; Reflection and evaluation.

Unit IV:

Community development and governance in India Community development policy in India; Community development perspectives in five year plans. Outreach of community development General orientation to outreach models - precede model, evaluation and indicator metrics; Outreach of urban; Rural and tribal community development programmes; Impact - economic and social perspectives

Unit V:

Cross cutting edges of community development Horizontal edges - education, health, women empowerment, skill development, agriculture and caste occupations; Vertical edges - adults, youth, adolescents, children, pregnant and lactating mothers, physically and mentally challenged. Globalization impact on community development Impact on social forms - individualism, enclavism and fatalism, transition between gemeinschaft and gesellschaft, issues of migration and mitigation.

Practical

Development of special project to study Community Development Programme outreach in selected area and execution. Preparation of project report and presentation

1. Selection of Community development Programme and detailed description of the Programme in terms of objectives, targets, inputs, expected outputs and outcome
2. Visit to Programme operating area and interaction with stakeholders implementing agency, personnel and beneficiaries
3. Visit to Programme operating area and interaction with stakeholders implementing agency, personnel and beneficiaries
4. Framing of special project for measurement of outreach – title, objectives, study area, research review and plan of work
5. Finalization of tools and techniques for execution of project
6. Finalization of tools and techniques for execution of project
7. Preparation of tools for execution of project

8. Field testing and finalization of tools
9-12. Execution of work plan
12. Data analysis and preparation of project report
13. Data analysis and preparation of project report
14. Presentation of report
15. End term assessment

(PGS 505) Technical Writing and Communications Skills 1(0+1)

Practical (Technical Writing)

- Various forms of scientific writings- theses, technical papers, reviews, manuals, etc.;
- Various parts of thesis and research communications (title page, authorship contents page, preface, introduction, review of literature, material and methods, experimental results and discussion);
- Writing of abstracts, summaries, précis, citations, etc.; Commonly used abbreviations in the theses and research communications;
- Illustrations, photographs and drawings with suitable captions; pagination, numbering of tables and illustrations;
- Writing of numbers and dates in scientific write-ups;
- Editing and proof-reading;
- Writing of a review article;
- Communication Skills - Grammar (Tenses, parts of speech, clauses, punctuation marks);
- Error analysis (Common errors), Concord, Collocation, Phonetic symbols and transcription;
- Accentual pattern: Weak forms in connected speech;
- Participation in group discussion;
- Facing an interview;
- Presentation of scientific papers.

Suggested Readings

- Barnes and Noble. Robert C. (Ed.). 2005. *Spoken English: Flourish Your Language.*
- *Chicago Manual of Style*. 14th Ed. 1996. Prentice Hall of India.
- *Collins' Cobuild English Dictionary*. 1995.
- Harper Collins. Gordon HM and Walter JA. 1970. *Technical Writing*. 3rd Ed.
- Holt, Rinehart and Winston. Hornby AS. 2000. *Comp. Oxford Advanced Learner's Dictionary of Current English*. 6th Ed. Oxford University Press.
- James HS. 1994. *Handbook for Technical Writing*. NTC Business Books.
- Joseph G. 2000. *MLA Handbook for Writers of Research Papers*. 5th Ed. Affiliated East-West Press.
- Mohan K. 2005. *Speaking English Effectively*. MacMillan India.
- Richard WS. 1969. *Technical Writing.*
- Sethi J and Dhamija PV. 2004. *Course in Phonetics and Spoken English*. 2nd Ed. Prentice Hall of India.
- Wren PC and Martin H. 2006. *High School English Grammar and Composition*. S. Chand & Co.

4th Semester

(EXT-510)	**Master Seminar**	**1(0+1)**
(EXT- 511 A)	**Master Research (Thesis)**	**30**

OR

(EXT- 511 B)	**IDEA (Internship for Development of Entrepreneurship in Agriculture)**	**30**