
	<p>Department of Agricultural Extension & Communication Mahatma Phule Krishi Vidyapeeth Rahuri-413 722, Dist. Ahmednagar (MS)</p>	
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Doctoral Programme in Agricultural Extension

Course Layout

Minimum Credit Requirements

Sr. No.	Subject	Minimum credit(s)
1.	Major	15
2.	Minor	08
3.	Supporting	05
4.	Seminar	02
5.	Research	45
	Total Credits	75
	Compulsory Non Credit Courses	06

Sr. No.	Course Number	Course Title	Credits
A) Major subjects (Min. 15 credits)			
1	EXT 601	Advances In Agricultural Extension	2+1=3
2	EXT 602	Advanced Design And Techniques In Social Science Research	2+1=3
3	EXT 603	Advances In Training Technology	2+1=3
4	EXT 604	Organizational Development	2+1=3
5	EXT 605	Advanced Instructional Technology	2+1=3
6	EXT 606	Theory Construction In Social Sciences	2+0=2
7	EXT 607	Advanced Management Techniques	2+1=3
8	EXT 608	Media Management	2+1=3
9	EXT 609	Transfer Of Technology In Agriculture	2+1=3
B) Minor Subjects (Min. 08 Credits)			
1	AG-ECON 606	Advanced Agril Marketing And Price Policy	2+1=3

2	AH 601	Advances In Livestock Production And Management	2+1=3
3	AG-ECON 609	Environmental Economics	2+1=3
C) Supporting Subjects (Min. 05 Credits)			
1	STAT 601	Advanced Statistical Methods	2+1=3
2	AH 610	Advances In Quality Control of Livestock Products	2+0=2
D) Seminar (02 Credit)			
	EXT 691	Doctoral Seminar I	0+1=1
	EXT 692	Doctoral Seminar Ii	0+1=1
E) Doctoral Research (45 Credits)			
	EXT 699	Doctoral Research	45
F) Non Credit Compulsory Courses			
1	PGS 501	Library And Information Services	0+1
2	PGS 502	Technical Writing And Communications Skills	0+1
3	PGS 503 (e-Course)	Intellectual Property And Its Management In Agriculture	1+0
4	PGS 504	Basic Concepts In Laboratory Techniques	0+1
5	PGS 505 (e-Course)	Agricultural Research, Research Ethics And Rural Development Programmes	1+0
6	PGS 506 (e-Course)	Disaster Management	1+0



Course Contents

A) Major Subjects:

EXT 601: ADVANCES IN AGRICULTURAL EXTENSION (2+1)

Theory:

Lecture No.	<i>Topic</i>
1, 2, 3, 4	Approaches of Agricultural Extension: A critical analysis of different approaches of agricultural extension. Importance and relevance of indigenous knowledge system, identification and documentation of ITK, Integration of ITK system in research formulation, Concept of Agricultural Knowledge and Information System, Training of Stakeholders of AKIS.
5	Cyber Extension - Concept of cyber extension
6, 7	National and international cases of extension projects using ICT and their impact of agricultural extension
10, 11	Research - Extension -Farmer - Market linkage: Importance, Scope, Implications etc.,
12, 13	Market - Led Extension, Farmer – Led Extension
14	Concept of Farm Field School, Farm School
15, 16	Public - Private Partnership: Meaning, Models, Identification of various areas for partnership.
17	Stakeholder's analysis in Extension.
18	Main streaming gender in Extension - Issues and Prospects
19, 20	Implications of WTO - AOA for extension services
21, 22	Re-orientation of extension services for agri-business and marketing activities, GOI-NGO collaboration to improve efficiency of extension
23, 24	Extension and contemporary issues: Extension and issues related to rural poverty
25, 26	Privatization of Extension.
27, 28	Intellectual Property Rights (IPRs).
29	Extension Reforms in India - Decentralized decision making, Bottom up planning,
30, 31, 32	Farming System and Situation based Extension Delivery System, Extension delivery through Commodity Interest Groups. Organization innovations in Extension - ATIC, IVLP, Kisan Call Centres

Practical:

- Documentation of ITK, cases on integration of ITK and formal research system,
- Study of cases on cyber extension and privatization of extension.
- Study of ATMA and SREP.
- Visit to Public-Private –Farmer partnership project.

Suggested Readings:

- Bagchi J. 2007. *Agriculture and WTO Opportunity for India*. Sanskruti.
- Chambers R, Pacy A & Thrupp LA. 1989. *Farmers First*. Intermediate Technology Publ.
- Crouch BR & Chamala S. 1981. *Extension Education and Rural Development*. Macmillan.
- John KC, Sharma DK, Rajan CS & Singh C. 1997. *Farmers Participation in Agricultural Research and Extension Systems*. MANAGE, Concept Publ. Co.
- Khan PM. 2002. *Text Book of Extension Education*. Himanshu Publ.
- Narasaiah ML. 2005. *Agricultural Development and World Trade Organization*. Discovery Publ.
- Talwar S. 2007. *WTO Intellectual Property Rights*. Serials Publ.
- Van den Ban BW & Hawkins BS. 1998. *Agricultural Extension*. S.K. Jain Publ.
- Venkaiah S. 2001. *New Dimensions of Extension Education*. Anmol Publ

EXT 602: ADVANCED DESIGNS AND TECHNIQUES IN SOCIAL SCIENCE RESEARCH (2+1)**Theory:**

Lecture No.	Topic
1, 2, 3, 4	Scaling technique - meaning, types, principles, steps and quality, techniques of attitude scale construction
5, 6	Paired comparison, Equal appearing intervals, Successive Intervals, Summated ratings
7, 8	Scalogram analysis
9, 10	Scale discrimination technique
11, 12	Reliability and Validity of Scales
13, 14, 15	Sociometrics, content analysis, case studies, Q-sort techniques, Semantic differential scale
16, 17	Projective and Semi projective techniques
18, 19	Critical incident techniques
20, 21	Computer packages for analysis - usage in Extension Research
22, 23	Knowledge scale measurement
24, 25, 26	Participatory tools and techniques in behaviour Research
27, 28	Data collection and valuation
29, 30	Impact analysis
31, 32	e-data collection and information analysis

Practical:

- Practice in constructing a scale and use of scale in various situations.
- Reliability and validity of the scales developed,
- Application of Semi Projective and Projective techniques.
- Content analysis, case studies.
- Practicing participatory tools and techniques.

- Hands on experience on Computer Preparation and Data Collection instruments,
- Review of previous studies.

Suggested Readings:

- Burns RB. 2000. Introduction to Research Methods. Sage Publ.
- Chandrakandan K & Karthikeyan C. 2004. Behavioral Research Methodology. Classical Publ.
- Daivadeenam P. 2002. Research Methodology in Extension Education. Agro-Tech Publ. Academy.
- Kerlinger N Fred. 2002. Foundations of Behavioural Research. Surjeet Publ.
- Kothari CR. 2000. Research Methodology Methods & Techniques. 2nd Ed. Wishwa Prakasham.
- Ray GL & Mondal S. 1999. Research Methods in Social Science and Extension Education. Naya Prokash.
- Roger L & Domino WSK. 1980. Research Methods. Prentice Hall.
- Sadhu AM & Singh A. 2003 Research Methodology in Social Science. Himalaya Publ. House.
- Sarantakos S. 1998. Social Research. 2nd Ed. Macmillan.
- Sinha SC & Dhiman AK. 2002. Research Methodology. ESS Publ.
- Verma RK & Verma G. 2002. Research Methodology. Commonwealth Publ.
- Walizer MH & Panl L. 2002. Research Methods & Analysis; Searching for Relationships. Wiemil Harper & Row.
- Wilkinson TS & Bhandarkar PL. 2002. Methodology and Techniques of Social Research. Himalaya Publ. House.

EXT 603: ADVANCES IN TRAINING TECHNOLOGY (2+1)

Theory:

Lecture No.	Topic
1, 2	Paradigm shift in training - learning scenario
3, 4, 5	Training Approaches – Experiential learning - laboratory - organization development (system) approaches
6, 7, 8, 9, 10	Training Design, Designing an effective training programme, Harmonizing training needs, Course Objective, content and methods
10, 11	Designing an effective training session - the semantics involved,
12, 13, 14, 15, 16	Designing experiential training sessions, simulation exercises, and openness in training transaction - managing dilemmas, ambivalence and conflicts and confusion (for both trainers and trainees).
17, 18, 19, 20, 21, 22	Recent Training Techniques for understanding and facilitation team building, group dynamics, motivation and empowerment, laboratory methods: micro-lab process work, and sensitivity training,
23, 24, 25	Psychological instruments as training tools: TAT, Inventories, Cases, etc.

26, 27, 28, 29	Participatory Training Techniques - Lecture, Brainstorming, Group discussion work shop Seminar, Symposium and Training Games. Role Play, Psycho-drama, Coaching, Counseling, etc.
30, 31, 32	Trainer's roles and dilemmas, Factors affecting Training Effectiveness and Training Evaluation.

Practical:

- Techniques of participatory training need assessment.
- Formulation of Course Objective, design of training programmes.
- Simulation exercises. Participatory training methods - Role Play & Brainstorming, Group discussion and Counseling and Conducting experiential learning sessions.
- Training evaluation - Techniques of Knowledge, Skill & Attitude evaluation.
- Visit to training institutions and study of training technologies followed.

Suggested Readings:

- Agochiya D. 2002. Every Trainer's Handbook. Sage Publ.
- Alan B & Calardy 2004. Five Case Studies in Management Training. Jaico Publ.
- Kumar A. 2000. Management Training Process. Anmol Publ.
- Leslie Rae. 1998. Techniques of Training. Jaico Publ.
- Lynton RP & Pareek U. 1999. Training for Development. 2nd Ed. Vistar Publ.
- Reid MA. 1997. Training Interventions, Managing Employee Development. Jaico.Publ.
- Samanta RK. 1993. Training Methods for Management and Development. M.D.Publ.
- Sethy ED. 2003. A Practical Hand Book on Training. Anmol Publ.

EXT 604: ORGANIZATIONAL DEVELOPMENT (2+1)

Theory:

Lecture No.	Topic
1, 2	Introduction to organizations: Concept and Characteristics of organizations,
3, 4, 5	Organizational Behaviour - Context and concept - levels of organizations – formal and informal organizations
6, 7	Theories of organizations
8, 9, 10	Nature of organizational theory - classical theories - features of Bureaucracy - administrative theory and Scientific management - Neo-classical theories - the human relations movement - modern theory
11	Systems approach to study organization needs and motives
12, 13	Attitude, values and ethical behaviour
14	Alienation and work – Work motivation
15, 16	Communication and interpersonal behaviour – Organizational communication, obstacles in organizational communication.
17	Leadership behaviour
18, 19	Decision making, problem solving techniques

20, 21	Organizational climate – change proneness and resistance to change, Organizational change
22	Organizational structure - Process in organizing
23	Dimensions of Motivational Climate
24, 25, 26	Departmentation - Span of Management - Delegation of authority – Centralization and decentralization - line and staff organization - functional organization - divisionalisation - Project organization - Matrix organization - free form organization - top management structure
27	Individual behaviour in organization.
28	Fundamentals of Human relations and Organizational behaviour
29, 30, 31, 32	Groups and teams - Organisational culture and performance. Dynamics of Organization behaviour - leadership conflict situations and inter group behavior- Organisational Development - Factors affecting organization effectiveness. Creativity, leadership, motivation and organization development

Practical:

- Simulation exercises on problem-solving
- Study of organizational climate in different organizations
- Study of organizational structure of development departments
- Study of departmentalization, span of control, delegation of authority, decisions making patterns
- Study of individual and group behaviour at work in an organization
- Conflicts and their management in an organization
- Comparative study of functional and non-functional organizations and drawing factors for organizational effectiveness

Suggested Reading:

- Ancona, Kochaw, Scully, Van Maanen, Westney 1999. *Organizational Behaviour and Processes*. South Western College Publ., New York.
- Banerjee M. 1984. *Organizational Behaviour*. Allied Publ.
- Deka GC. 1999. *Organizational Behaviour - A Conceptual Applicational Approach*. Kanishka Publ.
- Dwivedi RS. 2006. *Human Relations and Organization Behaviour- A Global Perspective*. 5th Ed. Macmillan.
- Kumar A. 2000. *Organizational Behaviour Theory and Practice*. Anmol Publ.
- Luthans F. 1998. *Organizational Behavior*. Tata McGraw Hill.
- Luthans F. 2001. *Organizational Behaviour*. McGraw Hill.
- Newstrom JW & Davis K. 1997. *Human Behaviour at Work*. Tata McGraw Hill.
- Robbins SP. 2007. *Organizational Behaviour*. Prentice Hall.
- Shaun T & Jackson T. 2003. *The Essence of Organizational Behaviour*. Practice Hall of India.
- Stephen RR. 1999. *Organizational Behaviour*. 5th Ed. Practice Hall of India.

EXT 605: ADVANCED INSTRUCTIONAL TECHNOLOGY (2+1)

Theory

Lecture No.	Topic
1	Concepts in Instructional Technology, Scope of Instructional Technology
2, 3	History of agricultural education in India
4	Guidelines for curriculum development in Agricultural Universities.
5, 6	Curriculum design development
7	Course outline
8, 9	Lesson plans for theory and practicals
10	Teaching and learning styles
11, 12	Theories of learning. Cognitive levels
13	Instructional Course Objective
14	Motivation of students
15, 16	Instructional Methods
17	Experiential learning cycle.
18, 19, 20	Innovative Instructional Aids
21, 22	Computer Assisted Instruction.
23	Programmed instruction technique
24	Team Teaching
25	E-Learning
26	Art of Effective Communication
27	Distance education
28	Student evaluation
29	Question Bank
30	Appraisal of Teacher Performance
31, 32	Review of research in Instructional Technology

Practical:

- Formulation of instructional Course Objective.
- Development and presentation of course outlines.
- Preparation & presentation of lesson plans for theory & practical with CAI design.
- Preparation of innovative low cost instructional aids.
- Development of model question bank.
- Preparation of schedule for teacher evaluation.
- Visit to Distance Education centre.
- Study of research reviews and Presentation of reports.

Suggested Readings:

- Agarwal JC. 2007. Essentials of Educational Technology Innovations in Teaching – Learning. 2nd Ed. Vikas Publ. House.
- Agarwal R. 2000. Educational Technology and Conceptual understanding. Anmol Publ.
- Dayal BK. 2005. Educational Planning and Development. Dominant Publ.

- Grover I, Kaushik S, Yadav L & Varma SK. 2002. Communication and Instructional Technology. Agro Tech Publ. Academy.
- Jacobsen D, Eggen P & Kauchak D. 1985. Methods for Teaching - A Skills Approach. 2nd Ed. Charles E. Merrill Publ.
- Joyee B & Well M. 1980. Models of Teaching. 2nd Ed. Prentice Hall.
- Khan PM. 2002. Text Book of Extension Education. Himanshu Publ.
- Rush N. 1987. Technology Based Learning - Selected Readings. London Publ. Co., New York.
- Tara Chand 1999. Educational Technology. Anmol Publ.

EXT 606: THEORY CONSTRUCTIONS IN SOCIAL SCIENCES (2+0)

Theory:

Lecture No.	Topic
1, 2	Importance of theory constructions in social science
3, 4, 5, 6	Theory: Meaning, elements, Ideal Criteria, Functions, Types
7, 8, 9	Definitions: Meaning, types and Rules
10, 11	Generalizations: Meaning, Classification
12, 13	Relationship: Meaning Types
14, 15, 16, 17, 18, 19	Terminologies used in theory constructions: Axiom, Postulate, Proposition, Theorem, Fact, Concept, Construct, Probability and Measurement Basic Derived
20, 21, 22, 23, 24	Steps in theory building - Axiomatic Techniques, Historical approaches. Scientific application
25, 26, 27, 28	Theoretical concept in Social Sciences.
29, 30, 31, 32	Test of Theory: Applying appropriate statistical tests

Suggested Readings:

- Blalock HM. Theory Construction: Form verbal to Mathematical Formulations. Prentice Hall.
- Dubin R. Theory Building. The Free Press, New York.
- Gibbs JP. Sociological Theory Construction. The Dryden Press, Illionis.
- Hage J. Techniques and Problems of Theory Constructions in Sociology. John Wiley & Sons
- Stinchombe AL. Construction of Sociological Theories. Harcourt, Brace & World.
- Wionton CA. Theory and Measurement in Sociology. John Wiley & Sons.

EXT 607: ADVANCED MANAGEMENT TECHNIQUES (2+1)

Theory:

Lecture No.	Topic
1, 2, 3	Management Information System (MIS): Basic concepts, types of information needed at various levels, design of MIS in an agricultural extension organization.
4, 5, 6	Scope for computerization, system alternatives and Evaluation. Implementation, operation and maintenance of the system
7, 8, 9, 10	Management by Objective (MBO): Elements of the MBO system. The Process of MBO. Making MBO effective. Evaluation of the MBO system - strengths and weaknesses.
11, 12	Transactional Analysis (TA): Ego states, transactions, inter relationships, strokes, stamps
13, 14, 15, 16, 17	Managing Organizational Stress: Sources of stress in organization, effect of stress. Coping mechanisms and managing stress, Stress management
18, 19, 20, 21, 22	Team Building Process: Types of teams. Steps in teamwork, Facilitators and barriers to effective relationships, nature of prejudice, tips in reducing interpersonal conflicts, intergroup conflict, resolving techniques. Conflict management, tips in reducing interpersonal conflicts
23, 24, 25, 26	Decision Support Systems (DSSs): Basic information about Artificial Intelligence (AI) Expert System (ESs), their future applications in extension system
27, 28, 29	Forecasting techniques - time series analysis and Delphi, decision making and talent management
30, 31, 32	PERT, CPM Techniques and time management

Practical:

- Managements Information system, in research & development organizations.
- Study of Management by Objective in an organization.
- Transactional Analysis,
- Exercises on Team building process,
- Coping skills with organizational stress,
- Exercises on Decision Support Systems (DSSs).
- Practical exercise on forecasting techniques,
- Visit to Management organizations.

Suggested Readings:

- Chaudhary AK. 1999. Encyclopedia of Management Information System. Vols. I, II. Anmol Publ.
- Hari Gopal K. 1995. Conflict Management - Managing Interpersonal Conflict. Oxford & IBH.
- James O'Brien 1999. Management Information System. Tata McGraw-Hill.

- Koontz H & Welhrich H. 2004. Essentials of Management. 5th Ed. Tata. McGraw-Hill.
- Lauden & Lauden 2003. Management Information System. Pearson Edu.
- Maheswari BL. 1980. Organizational Decision Styles & Orgul Effectiveness. Vikas Publ.
- McGrath SJEH. 2007. Basic Management Skills for All. 7th Ed. Prentice Hall of India.
- West JD & Leevy FK. 1998. A Management Guide to PERT / CPM with GERT / PDM / DCPM and Other Networks. Prentice Hall of India.

EXT 608: MEDIA MANAGEMENT (2+1)

Theory:

Lecture No.	Topic
1	Media Management – Definition, Principles and Significance of Media Management
2, 3	Media Ownership patterns in India – Proprietorship, Partnership, private Ltd, Public companies, Trusts, Co-operatives, Religious Institutions (Societies) & Franchisees (Chains).
4	Marketing Function – Product, Price, and Placement & Promotions
5, 6	Farm Journalism – meaning and Developments in Farm Journalism in India. Different problems with Farm Journalism.
7	Print Media – History, the role of the press,
8, 9	News, Types of News, elements of News and Sources of News, the making of newspaper & magazines,
10, 11	Press codes and ethics, Media Laws
12, 13	Techniques in book Publishing
14, 15	Editing – Principles
16, 17	Tools & Techniques and art of Proof Reading.
18, 19	Measuring Readability of writing
20	Electronic Media-Role and Importance of Radio -History, Radio Role in TOT, writing and presentation techniques
21, 22	Different Programmes of Farm Broadcast, developing content for farm broadcast, Role of FM Radio in Agriculture, Ethics of Broad casting, Broadcasting Policy and code. Community Radio – Concept, meaning, role in TOT, Cases of Community radio
23, 24	Television – History - Role in TOT , Fundamentals of Television Production, Techniques of Script writing for TV, Visual Thinking, language & Style, Farm Telecast programmes, cable and satellite TV and their impact, Ethics of Telecasting, policy and code
25, 26	Video Production Technology – Potential and its utilization, Typology of farm Video production, Types of Video Production and equipment used in the production, Procedure or Technique of video production
27	Traditional Media – Role of Folk Media in TOT and integration with electronic media

28	Advances in communication Technology – Management of Agricultural Information System (MAIS).
29, 30	Use of Modern Communication Medium- Electronic Video, Teletext, tele conference, Computer assisted instruction
31, 32	Video conferencing, - Features, Advantages, Limitations and risk factors involved in New Media. Designing and developing of communication and media strategy for developmental programmes. Online journalism scope & importance.

Practical:

- Exercise on Writing for Print Media – Writing News / Success Stories / Feature articles for different topics related to Agriculture & allied fields.
- Exercise of editing & proof reading the Farm News for News papers – different types of intro and leads.
- Exercise of Writing for Radio, TV, Preparation of story board for farm Video Production
- Script writing for Radio and T.V.
- Visit to media management organizations for studying the principles, procedures and processes in managing the media.
- Participation and Interaction through video conference.
- Developing communication & Media Strategy for selected developmental programme / activity.

Suggested Readings:

- Bhaskaran C, Prakash R & Kishore Kumar N. 2008. Farm Journalism in Media Management. Agro-Tech Publ. Academy.
- Chatterjee PC. 1991. Broadcasting in India. Sage Publ.
- Chiranjeev A. 1999. Electronic Media Management. Authors Press.
- D'Souza YK. 1998. Principles and Ethics of Journalism and Mass Communication. Commonwealth Publ.
- Defleur ML & Dennis EE. 2001. Understanding Mass Communications. Goyalsaab Publ.
- Jain SC. 2006. International Marketing Management. CBS Publ.
- Keval J Kumar. 2004. Mass Communication in India. Jaico Publ.
- Malhan PN. 2004. Communication Media: Yesterday, Today and Tomorrow. Directorate of Publication Division, New Delhi.
- Mehta DS. 1992. Mass Communication and Journalism in India. Allied Publ.
- Panigrahy D. 1993. Media Management in India. P. K. Biswasroy (Ed.). Kanishka Publ.
- Shrivastava KM. 1995. News Writing for Radio and TV. Sterling Publ.
- Sinha KK. 2001. Business Communications. Galgotia Publ.

Compulsory Non Credit Courses

PGS 501: LIBRARY AND INFORMATION SERVICES (0+1)

Practical

- Introduction to library and its services; Types of library.
- 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, CABs 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;
- e-resources access methods.

PGS 502: TECHNICAL WRITING AND COMMUNICATIONS SKILLS (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:

- Chicago Manual of Style. 14th Ed. 1996. Prentice Hall of India.
- Collins' Cobuild English Dictionary. 1995. Harper Collins.
- Gordon HM & Walter JA. 1970. Technical Writing. 3rd Ed. Holt, Rinehart & 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*. Barnes & Noble.
- Robert C. (Ed.). 2005. *Spoken English: Flourish Your Language*. Abhishek.
- Sethi J & Dhamija PV. 2004. *Course in Phonetics and Spoken English*. 2nd Ed. Prentice Hall of India.
- Wren PC & Martin H. 2006. *High School English Grammar and Composition*. S. Chand & Co.

PGS 503: INTELLECTUAL PROPERTY AND ITS MANAGEMENT IN AGRICULTURE (1+0) (e-Course)

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 bio-diversity 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 & 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 & Aesthetic Technologies. Ministry of Agriculture, Government of India. 2004. *State of Indian Farmer*. Vol.
- *V. Technology Generation and IPR Issues*. Academic Foundation.
- Rothschild M & 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.

- *The Indian Acts - Patents Act, 1970 and amendments; Design Act, 2000; Trademarks Act, 1999; The Copyright Act, 1957 and amendments; Layout Design Act, 2000; PPV and FR Act 2001, and Rules 2003; National Biological Diversity Act, 2003.*

PGS 504: BASIC CONCEPTS IN LABORATORY TECHNIQUES (0+1)

Practical:

- Safety measures while in Lab;
- Handling of chemical substances;
- Use of burettes, pipettes, measuring cylinders, flasks, separatory funnel, condensers, micropipettes and vascupets;
- 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;
- Neutralisation 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 & Latchem WE. 1968. *A Handbook of Laboratory Solutions*. Chemical Publ. Co.

PGS 505: AGRICULTURAL RESEARCH, RESEARCH ETHICS AND RURAL DEVELOPMENT PROGRAMMES (1+0) e-Course)

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;
- Consultative Group on International Agricultural Research (CGIAR): International Agricultural Research Centres (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 II

- Research ethics: research integrity, research safety in laboratories,
- Welfare of animals used in research,
- Computer ethics,
- Standards and problems in research ethics.

UNIT III

- 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 Organisations.
- Critical evaluation of rural development policies and programmes.
- Constraints in implementation of rural policies and programmes.

Suggested Readings:

- Bhalla GS & 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 506: DISASTER MANAGEMENT (1+0) (e-Course)

Theory:

UNIT I

- Natural Disasters- Meaning and nature of natural disasters, their types and effects. Floods, Drought, Cyclone, Earthquakes, Landslides, Avalanches, Volcanic eruptions, Heat and cold Waves,
- Climatic Change: Global warming, Sea Level rise, Ozone Depletion

UNIT II

- Man Made Disasters- Nuclear disasters, chemical disasters, biological disasters, building fire, coal fire, forest fire. Oil fire, air pollution, water pollution, deforestation, Industrial wastewater pollution, road accidents, rail accidents, air accidents, sea accidents.

UNIT III

- Disaster Management- Efforts to mitigate natural disasters at national and global levels.

- International Strategy for Disaster reduction.
- Concept of disaster management, national disaster management framework; financial arrangements; role of NGOs, Community-based organizations, and media. Central, State, District and local Administration; Armed forces in Disaster response; Disaster response: Police and other organizations.

Suggested Readings:

- Gupta HK. 2003. *Disaster Management*. Indian National Science Academy. Orient Blackswan.
- Hodgkinson PE & Stewart M. 1991. *Coping with Catastrophe: A Handbook of Disaster Management*. Routledge.
- Sharma VK. 2001. *Disaster Management*. National Centre for Disaster Management, India.