

COLLEGE OF HOME SCIENCE

PG and Ph.D Syllabus

CONTENTS

S.No	Department	Page No
1	Extension Education and Communication Management	2-20
2	Food and Nutrition	21-40
3	Supporting Courses	41-48

**Extension Education and Communication Management
Course Programme for M.Sc.**

Semester I

S.No.	Course No.	Title	Credit Hours
1.	HECM - 501	Global Extension System (Compulsory)	3(3+0)
2.	HECM - 503	Communication For development(Compulsory)	3(1+2)
3.	HECM - 505	Participatory Programme management (Optional)	3(1+2)
4.	Minor		3
5.	PGS -501	Library and Information services (NC)	1(0+1)
6.	PGS-502	Technical writing and communication skill (NC)	1(0+1)
7.	HECM-506	Gender Sensitization for Empowerment(Optional)	2(2+0)

Semester II

S.No.	Course No.	Title	Credit Hours
1.	HECM -502	Training and Human resource Development	3(1+2)
2.	HECM - 507	Extension Management	2(2+0)
3.	Minor		3
4.	HSc -500	Research Methods in Home Science	3(3+0)
5.	STAT -501	Statistical Method	3(2+1)
6.	HECM -508	Corporate Communication and event Management	3(1+2)

Semester III

S.No.	Course No.	Title	Credit Hours
1.	HECM -504	Media Production and Management	3(1+2)
2.	HECM - 510	Educational Technology	3(2+1)
3.	HECM-511	ICT and New Media	2(0+2)
4.	HECM-509	Scientific Writing And Reporting for Media	3(1+2)
5.	HECM -599	Master Research	3(3+0)
6.	PGS-503	Intellectual Property(NC)	1(1+0)
7.	PGS-505	Agricultural Research, Research Ethics and Rural Development Programmes(NC)	1(1+0)

Semester IV

S.No.	Course No.	Title	Credit Hours
1.	HECM - 591	Seminar	1(0+1)
2.	HECM- 541	Comprehensive	2(2+0)
3.	PGS-506	Disaster Management (NC)	1(1+0)
4.	HECM -599	Master Research	12

College of Home Science
Extension Education and Communication Management
Course Programme for Ph.D.

Semester I

S.No.	Course No.	Title	Credit Hours
1.	HECM - 601	Recent trends in extension and communication (MAJOR)	3(3+0)
2.	HECM - 606	Monitoring evaluation and impact assessment (MAJOR)	3(3+0)
		Minor	3
5.	STAT-600	Data processing (SUPPORTING)	2(1+1)
6.	PGS-506	Disaster management (NC)	1(1+0)

Semester II

S.No.	Course No.	Title	Credit Hours
1.	HECM -607	Advertising and marketing communication (MAJOR)	2(1+1)
2.	HECM - 603	Advanced media management (MAJOR)	3(2+1)
3.	Minor		3
5.	HSc -600	Research project management (SUPPORTING)	3(2+1)
6.	PGS -501	Library information services(NC)	1(0+1)
7.	PGS-502	Technical writing (NC)	1(0+1)

Semester III

S.No.	Course No.	Title	Credit Hours
1.	HECM -504	Media Production and Management	3(1+2)
2.	HECM - 510	Educational Technology	3(2+1)
3.	HECM-511 ICT and New Media		2(0+2)
4.	HECM-509	Scientific Writing And Reporting for Media	3(1+2)
5.	HECM -599	Master Research	3(3+0)
6.	PGS-503	Intellectual Property(NC)	1(1+0)
7.	PGS-505	Agricultural Research, Research Ethics and Rural Development Programmes (NC)	1(1+0)

Semester IV

S.No.	Course No.	Title	Credit Hours
1.	HECM - 591	Seminar	1(0+1)
2.	HECM- 541	Comprehensive	2(2+0)
3.	PGS-506	Disaster Management (NC)	1(1+0)
4.	HECM -599	Master Research	12

EXTENSION EDUCATION & COMMUNICATION MANAGEMENT

Course Contents

M.Sc Programme

HECM 501 GLOBAL EXTENSION SYSTEMS 3+0

Objective

To appraise students about historical perspectives of extension education in India and comparative extension system of selected countries.

Theory

UNIT I

Extension systems in India; Extension efforts after independence - Community Development Programme – Genesis and critical appraisal; Panchayati Raj Institutions; Area and target oriented programme – IAAP, T & V; Special programmes for poor, women and children - IRDP, TRYSEM, DWCRA; JRY, IAY, SGSY.

UNIT II

Extension Approaches to rural development; Adult literacy programme - Need, Importance and Objective, National Literacy mission, Post literacy activities; Support structures and their functions – DRDA, NREGP, Central Social Welfare Board, State Social Welfare Board, NABARD; National Level Voluntary Agencies – CAPART and KVIC; ICAR extension systems- KVK, NATP, IVLP, ATIC, NAIP, AICRP.

UNIT III

Role of SAUs in rural development; role of international organizations in rural development; Review of five year plans in India; privatization of extension services-scope and limitations.

UNIT IV

Comparative extension system of selected developed and developing countries: USA, UK, Israel, China, Pakistan, Japan and Brazil with brief history, approaches, organizational structure, linkage with research and extension methods used; its comparative analysis with Indian extension system.

Suggested Readings

- Axinn George H & Thorat SS. 1972. *Modernizing Agricultural World Wide*. Oxford & IBH.
- Cernea MM, Russel JFA & Coulter JK. (Eds.). 1983. *Agricultural Extension by Training and Visit- The Asian Experience*. The World Bank Washington D.C.
- Cernea MM, Russel JFA & Coulter JK. (Eds.). 1983. *Agricultural Extension by Training and Visit- The Asian Experience*. The World Bank Washington D.C.
- Dantwala ML & Barmeda JN. 1990. *Rural Development Approaches and Issues, Indian Ag. Dev. Since Independence*. Oxford & IBH.

- Dantwala ML & Barmeda JN. 1990. *Rural Development Approaches and Issues, Indian Ag. Dev. Since Independence*. Oxford & IBH.
- Dhama OP & Bhatnagar OP. 1991. *Communication for Development*. Oxford & IBH.
- Mondal S & Ray GL. 2007 *A Text Book of Rural Development*. Kalyani.
- Ray GL. 2006. *Extension Communication and Management*. Kalyani.
- Rivera WH. 1987. *Agricultural Extension World Wide Issues, Practices and Emerging Pririties*. Croom Helm.
- Singh H. 1985. *Rural Development in India*. Print Well Publ.
- Singh H. 1985. *Rural Development in India*. Print Well Publ.
- Singh RP, Mathur PN & Kumar GAK. 1999. *Extension Education - A Handbook for Extension Personnel*. IFWA, IARI, New Delhi.
- Swanson BE, Bants RP & Sofrenko AJ. 1984. *Improving Agriculture Extension - A Reference Manual*. FAO.
- Vanden Ban AW & Hawkins HS. 1988. *Agriculture Extension*. Longman Scientific Technicals.

HECM 502 TRAINING AND HUMAN RESOURCE DEVELOPMENT 1+2

Objective

To acquire knowledge and skill on various aspects of trainings, human resource development and develop expertise as training professionals.

Theory

UNIT I

Training – concept and importance in Human Resource Development (HRD) and rural development; types of training; conceptual models of training process.

UNIT II

Participatory training methods - lecturette , interactive demonstration, brain storming, case studies, syndicate method, simulation exercises, role –play, business game, in-basket exercise; sensitivity training, T-group, transactional analysis and fish bowl exercise.

UNIT III

Experiential Learning Cycle (ELC)- concept and types; designing, management and delivery of training programme; monitoring, evaluation and impact assessment.

UNIT IV

Human resource – concepts, importance and types; HRD- concept, dimensions and importance in rural development; strategic interventions; HRD policies of Government, ICAR and NGOs; facilitators of HRD- motivations, stress management; techniques of HRD.

Practical

Visiting and studying the nature and functioning of training institute; practice of selected training methods, planning, organizing and evaluation of training programmes for different clientele.

Suggested Readings

- Lynton R. & Pareek U. 1991. *Training Development*. Vistat.
- Singh RP. 2000 *Management of Training Programmes*. Anmol Publ.

Objective

To acquaint students about communication process, recent advances in communication and diffusion and help students acquire necessary communication skills.

TheoryUNIT I

Communication- concept, meaning, importance, models, theories and types; communication approaches- individual, group and mass, factors affecting their selection and use; communication fidelity, credibility, empathy, feedback and factors affecting communication process; barriers in communication.

UNIT II

Communication skills; Role of ICT in communication, soft skills; effective oral communication, public speaking; non-verbal communication, writing skills; soft skills; role of ICT in communication.

UNIT III

Participative communication - meaning, importance, process and determinants; development communication- concept, nature and significance; recent advances in communication-print and electronic, internet, e-mail, fax, mobile, interactive video and teleconferencing, computer and computer networking (PAN, LAN, CAN, MAN, WAN); AGRINET, e-Governance.

UNIT IV

Concept and element of diffusion; concept and stages of Innovation – decision process, attributes and consequences of Innovations; adopter categories and innovativeness.

Practical

Practical exercises on oral and written communication; planning and use of different communication approaches; Practical hands on experience in recent advances in print, electronic and new media.

Suggested Readings

- Bhagat R. & Mathur PN. 1989. *Mass Media and Farm Women*. Intellectual Publ. House.
- Chopra K, Kaukodi GK & Murthy MN. 1990. *Participatory Development*. Sage Publ. Deep & Deep Publ.
- Hage Jerald 1977. *Communication and Organizational Control*. Wiley Interscience.
- Melkote SR. 1991. *Communication for Development in the Third World: Theory and Practices*. Sage Publ.
- Mody B. 1991. *Designing Message for Development Communication*. Sage Publ.
- Punam Linda L & Pacanowsky Micheal E. 1983. *Communication and Organizations: An Interpretive Approach*. Sage Publ.
- Ratnaswamy P. 1995. *Communication Management - Theory and Practice*.
- Ray GL. 1991. *Extension and Communication and Management*. Naya Prakashan.
- White Shirley A, Nair KS & Ascroft J. 1994. *Participatory Communication*. Sage Publ.

Objective

To develop competency in production and management of different media.

TheoryUNIT I

Production technology, process and skills; process of producing newspaper, magazine and other printed literature (leaflets, brochures, newsletters, bulletins, booklets, posters etc.).

UNIT II

Concept of media and role in changing communication scenario; multi-media – concept and evolution of multimedia; fundamentals of making a multi media programme-text; graphics, audio, etc; process of producing radio, television and multi media programmes; different programme formats for radio and television; hardware and gadgetry requirements; use of radio, television, and multimedia in extension; planning and production of selected media products-print and electronic.

UNIT III

Paper-kinds of paper, sizes; colour theory for print and multi media; software for production-basics of photoshop, pagemaker, coral draw, quarkxpress; use of graphics, illustrations and diagrams in production; animation.

UNIT IV

Ownership patterns of various media; economics of media organizations; organizational structures; different departments; production planning; lay out consideration; marketing planning; registration; liaison with government departments; understanding regulatory mechanisms for newspapers; radio and television; co-ordination; motivation; decision making and control.

Practical

Visit to media industries and marketing agencies; Planning and production of selected media products – print and electronic; Study of one multimedia enterprise in detail; Preparing a project proposal for submitting to a funding agency.

Suggested Readings

- Akhauri MMP. 1990 *Entrepreneurship for Women in India*. NIESBUD, New Dehli.
- Gupta CB & Srinivasan NP. 2000. *Entrepreneurship Development in India*. Sultan Chand & Sons
- Hisrich RD & Brush CG. 1986. *The Women Entrepreneurs*. D.C. Health & Co.
- Meredith GG. 1982. *Practice of Entrepreneurship*. ILO.
- Singh N. 2003 *Effective Entrepreneurship Management*. Anmol Publ
- Verma S. 2004. *Entrepreneurship and Effective Marketing*. Aavishkar Publ.

Objective

To develop understanding regarding the principles, procedure and approaches of extension programme planning, implementation, evaluation of extension programme and participatory management techniques.

TheoryUNIT I

Conceptual framework of extension programme planning – key concepts and importance in planned change.

UNIT II

Participatory planning – concept, importance, process; techniques of participatory planning- RRA, PRA and PLA and their application in extension; approaches of participatory planning – cooperative, democratic, bottom up and down.

UNIT III

Project management techniques – PERT, CPM, SWOT analysis; obtaining technical and monetary support from GOs and NGOs ; importance and ways of people's participation in programme planning, concept and formation of women SHGs.

UNIT IV

Implementation and evaluation - concept, importance and techniques.

Practical

Application of PRA methods; critical review of evaluation studies related with women and rural development programmes; critical analysis of monitoring and evaluation of developmental programmes; preparation and implementation of home improvement work plans; critical evaluation of work plan with specific evaluation techniques; organize and evaluate programmes related to women and children at village level.

Suggested Readings

Adhikary MM. 2006. *Participatory Planning & Project Management in Extension Sciences*. Agrotech Publ. Academy.

Basu. D. 2006. *Participatory Monitoring & Evaluation of Development programmes: Prationer's Guide*. Agrotech Publ. Academy.

Dhama OP & Bhatnagar OP. 1991. *Communication for Development*. Oxford & IBH.

Dhama OP. 1986 *Extension and Rural Welfare*. Ram Prasad & Sons.

Mukherjee N. 1994. *Participatory Rural Appraisal - Methodology and Application*. Concept Publ. Co.

Ray GL. 1991. *Extension Communication and Management*. Naya Prokash.

Sandhu AS. 1994. *Extension Programme Planning*. Oxford & IBH.

Singh R. 1987. *A Text Book of Extension Education*. Sahitya Kala Prakashan.

Objective

To sensitize students about various dimensions of gender and development, legal rights and using gender tools and methodologies.

TheoryUNIT I

Gender and empowerment: meaning, gender related definitions and importance for empowering women; need and focus on gender sensitization - gender in community diversity and its implication for empowerment.

UNIT II

Gender perspectives in development of women, social characteristics, roles, responsibilities, resources, constraints, legal issues and opportunities; economical, educational and other parameters.

UNIT III

Gender tools and methodologies: Dimensions and methodologies for empowerment; gender budgeting; gender analysis framework- context, activities, resources and programme action profile; technologies and empowerment - gender specific technologies, household technology interface, socio-cultural interface and women as consumer of technologies.

UNIT IV

Gender issues and development: health and nutrition, violence, governance, education and media.

Suggested Readings

- Cockburn C & Ormrod S. 1993. *Gender and Technology in the Making*. Sage Publ.
- Grover I. 2006. *Introducing Gender*. Manual, Department of Home Science Extension Education, COHS, CCS HAU, Hisar.
- Grover I. 2006. *Unpacking Gender and Feminism*. Manual, Department of Home Science Extension Education, COHS, CCS HAU, Hisar.
- Grover I., Kaushik S & Khetarpaul N. 2006. *Gender Health and Nutrition*. Manual, Department of Home Science Extension Education, COHS, CCS HAU, Hisar.
- Kaushik S. 2006. *Gender & Education*. Manual, Department of Home Science Extension Education, COHS, CCS HAU, Hisar.
- Krishanraj M & Chanani K. 1989. *Gender and the Household Domain - Social and Cultural Dimension*. Sage Publ.
- Me Neil Maureen (Ed.). 1989. *Gender and Expertise*. Free Association Books.
- Mehta S. 2006. *Gender and Media*. Manual, Department of Home Science Extension Education, COHS, CCS HAU, Hisar.
- Oxfam 1994. *Gender Training Manual*. Oxfam.
- Rani S. 2006. *Gender and Work*. Manual, Department of Home Science Extension Education, COHS, CCS HAU, Hisar.
- Rose K. 1992. *Where Women are Leaders -The SEWA Movement in India*. Vistaar Publ.
- Shiva V. 1989. *Staying Alive - Women, Ecology and Development*. Zed Books.
- Yadav L. 2006. *Gender and Governance*. Manual, Department of Home Science Extension Education, COHS, CCS HAU, Hisar.

Objective

To familiarize students with basic concept, importance, elements, functions and principles of extension management and to sensitize them about problems and issues of extension management and appraisal of management of various extension organizations.

TheoryUNIT I

Concept of administration and management; principles and theories of administration and management, schools of management thoughts; meaning, nature and scope of extension management; scientific management movement.

UNIT II

Process of management; Planning, Organizing, Staffing- meaning definition of staffing, Directing, Communicating, co-ordination, controlling, monitoring and evaluation .

UNIT III

Organizational climate, behaviour, development; Management by Objective (MBO).

UNIT IV

Qualities and functions of extension personnel; extension system of ICAR, SAUs and state departments; problems and issues of extension management in India; critical appraisal of management of various extension organizations, community conflicts and its resolution.

Suggested Readings

Ahuja KK. 1983. *Personnel Management*. Kalyani.

Dhama.OP & Bhatnagar OP. 1991. *Education and Communication for Development*. Oxford & IBH.

Grover I. 2002. *Extension Management*. Agrotech Publ.

Ray GL. 2006. *Extension Communication and Management*. Kalyani.

Tripathi PC & Reddy RN. 1983. *Principles of Management*. Tata McGraw Publ.

Objective

To develop understanding about concept, goals and strategies of corporate communication, public relation and event management and also develop skill in planning and managing an event.

TheoryUNIT I

Corporate communication – concept & importance with special reference to Indian Electronic Media context; Identification and understanding corporate goals; corporate policy, strategy and corporate niche, branding; corporate planning, implementation and evaluation.

UNIT II

Corporate public relations-community, customer, investors, media relations; communication campaigns, managing corporate crises, change management conflict and communication, communication audit, managing diversity, issues management; new media and corporate communication.

UNIT III

Strategic communication support during mergers/acquisitions, litigations; corporate social responsibility, monitoring blogs for PR activity, environmental analysis; rural public relations; social marketing.

UNIT IV

Event management – concept, objective, need, types and structures of event; priority of event management; process of organizing and event; effective use of resources in context to vision, mission and roles; effective goal planning strategies; planning events- press meets/conferences/exhibitions, organizing media tours; evaluating public opinion.

Practical

Visit to different corporate organizations related to media, organizing discussion with corporate personnel; planning and organizing an event for effective communication with corporate sector.

Suggested Readings

- Chopra K, Kaukodi GK & Murthy MN. 1990. *Participatory Development*. Sage Publ.
- Dwivedi RS. 1982. *Management of Human Resources: A Behavioural Approach to Personnel*. Oxford & IBH.
- Hage Jerald 1977. *Communication and Organizational Control*. Wiley Interscience.
- Hellriegel Don, Slocum John W & Woodman, Richard W. 1992. *Organizational Behavior*. 6th Ed. West Publ. Co.
- Melkote SR. 1991. *Communication for Development in the Third World: Theory and Practices*. Sage Publ.
- Mody B. 1991. *Designing Message for Development Communication*. Sage Publ.
- Pareek U & Rao T Venkateswara 1981. *Designing and Managing Human Resource System*. Oxford & IBH.
- Punam Linda L & Pacanowsky Micheal E. 1983. *Communication and Organizations: An Interpretive Approach*. Sage Publ.
- Ratnaswamy P. 1995. *Communication Management - Theory and Practice*. Deep & Deep Publ.
- Wertger William B & Keith Davis 1982. *Personnel Management and Human Resources*. McGraw Hill.
- White Shirley A, Nair KS & Ascroft J. 1994. *Participatory Communication*. Sage Publ.

HECM 509 SCIENTIFIC WRITING AND REPORTING FOR MEDIA 1+2

Objective

To acquaint and develop writing and reporting skills among students about science and Technology in various formats for different clientele to media.

Theory

UNIT I

Concept and various formats of scientific communication, need and importance of scientific communication in changing communication scenario.

UNIT II

Concept of reporting, types of reporting, reporting skills; Reporting -Field reporting, coverage of Science and Technology events (conference /speeches / seminars and conventions / exhibitions / natural phenomena etc.); Role & responsibilities of a reporter, classification and qualities of a reporter; techniques of reporting.

UNIT III

Writing: Writing for special target groups like – children, women, farmers and rural folks. Writing in various format for newspaper, science columns, magazines and books.

UNIT IV

Editing: Its principles and process, proof reading, editing of articles, stories and newspaper etc.

Practical

Field reporting, coverage of Science and Technology events –conference, speeches, seminars, conventions, exhibitions, natural phenomena, Writing for different clientele, editing. Compulsory Industrial Training for Extension Students.

Suggested Readings

D'Souza YK. 2000. *Encyclopedia of Advanced Journalism*. Vols. I-III. Anmol Publ.

Ravindran RK. 1999. *Hand Book of Reporting and Editing*. Anmol Publ.

HECM 510 EDUCATIONAL TECHNOLOGY 2+1

Objective

To develop ability among students in handling of different educational technologies and build competency as a teacher and public speaker.

Theory

UNIT I

Teaching learning process: meaning and characteristics of teaching and learning; teaching learning process, maxims of teaching which facilitate teaching learning process, stages, forms and levels of teaching and learning. Motivation- concept, importance and techniques.

UNIT II

Meaning and scope of educational technology; curriculum design and development; lesson planning: concept and methodology; teaching learning strategies: microteaching, programmed instruction, simulation role-play, team teaching, experiential learning, traditional media, ICT, video 'production and multimedia presentations etc.

UNIT III

Genesis and trends in modern education; management of formal and non formal education in India; vocationalization of education; distance education; guidance and counseling.

UNIT IV

Evaluation of instructions effectiveness: competence based question paper; reliability and validity of question papers.

Practical

Designing a course curriculum, preparation of lesson plans of selected topics; preparation and use of different instructional material; conducting selected, teaching lessons; exercises on teaching learning strategies; reading and speech exercises; construction of competency based question paper and seminar organization.

Suggested Readings

- Kemp Jerrold E. 1985. *Planning and Producing Audio Visual Materials*. Harper & Row.
- Kochhar SK. 1985. *Methods and Techniques of Teaching*. Sterling Publ.
- Kulkarni SS. 1986. *Introduction to Educational Technology*. Oxford & IBH.
- Robert Heinich 1990. *Instructional Media*. MacMillan.
- Vedanayagam EG. 1988. *Teaching Technology for College Teachers*. Sterling Publ.

HECM 511

ICT AND NEW MEDIA

0+2

Objective

To familiarize students with the ICT and new media technologies and provide hands on training.

Practical

Multi media and emerging technologies. Video-on demand, internet radio and web television, impact of new media on traditional media. Writing for general interest sites, online and net newspapers and editions, blogs, search engines, video logs, citizen journalism, unique features of web language, web pages, home pages, design and layout. Writing on specialized area on the web. Evaluation of e-journals- advantages and disadvantages. Web site designing concept, HTML, interactive, web animation, animated graphics, designing interactive elements, sound addition, web visual editor, creation and editing.

Suggested Readings

- Robert Reinhard & Snow Dowd 2004. *Macromedia Flash Mx 2004 Bible*. Wiley.
- Tay Vaghan 2002. *Multimedia- Making it Work*. 5th Ed. Tata McGraw-Hill.

Ph.D Programme

HECM 601	RECENT TRENDS IN EXTENSION AND COMMUNICATION	3+0
-----------------	---	------------

Objective

To develop understanding about concept, approaches, models and theories of extension and recent advances in communication.

Theory

UNIT I

Changing concepts and emerging issues in extension – Rational and realities; recent Extension strategies for rural upliftment; future scenario of extension.

UNIT II

Recent trends in technology transfer –Need of Identification and documentation of appropriate homestead technologies, Assessment and refinement of technologies; Importance and relevance of indigenous technical knowledge system, Integration of ITK with formal research.

UNIT III

Emerging issues in communication- understanding communication in global perspective; Role of Mass Media for rural audience with special emphasis on women.

UNIT IV

New communication technologies ;computer Assisted Instruction; Latest in print technology; Enhancing learning through communication intervention; Visual communication – A psychological perspective; Distance learning Cyber extension- definition, scope, advantage, limitations, application in Home Science.

Suggested Readings

Grover I, Sethi N & Grover D. 2004. *Handbook of Communication and Media*. Agro-tech Publ. Academy.

Gupta VS. 2005. *International Communication*. Concept Publ.

Rao VM. 2007. *E-Governance*. ABD Publ.

Wadia A. 1999. *Communication and Media*. Kanishka Publ

HECM 602	MANAGERIAL SKILLS FOR EXTENSION PROFESSIONALS	3+0
-----------------	--	------------

Objective

To develop expertise on management problems of extension organizations and learn techniques of management in extension organizations.

Theory

UNIT I

Conceptualization of management process and its major functions; Management problems in extension organizations; Managerial skill - Nature and importance for extension professionals; Skills in effective management of extension and rural development organizations.

UNIT II

Strategic planning: importance, steps and techniques involved; Management by objective as applicable to extension organizations; Techniques of Transactional Analysis for improving interpersonal communication.

UNIT III

Creative problem solving techniques; Stress management practices; Total Quality Management (TQM); Concept of learning organization to improve extension services at various levels; Time management practices; Development of Management Information System for extension organization at various levels.

UNIT IV

Work motivation Organizational climate; Resource management: concept and methods; Team building: process and strategies at organizational and village levels. Mobilization and empowerment skills: concept and strategies in mobilization, concretisation and empowerment of rural people.

Suggested Readings

- Jan Servaes, Thomas L Lacobson 1996. Shirley A White (Ed.).
Participatory Communication for Social Change. Sage Publ.
- Leon C Megginson, Donald C Hosely & Paul H Pietri Jr. 1989.
Management Concepts and Applications. 3rd Ed. Harper & Row.
- Michel Le Boeuf (Ed.). 2001. *Essence of time Management*. Jaico Publ. House.
- Narayan B. 1999. *Project Management*. APH Publ.
- Srinivasan R & Chunawalla SA. 1995. *Management Principles & Practice*. 4th Ed. Himalaya Publ. House.
- Stemphen P Robbins 1989. *Training in Inter Personal Skills: Tips for Managing People at Work*. Prentice Hall.
- Tripathi PC & Reddy PN. 1995. *Principles of Management*. 2nd Ed. Tata McGraw Hill.

HECM 603

ADVANCED MEDIA MANAGEMENT

2+1

Objective

To strengthen the capabilities in media planning and production.

Theory

UNIT I

Principles of management; managing the media organization; managerial functions in the media organization; introduction to media organization.

UNIT II

Editorial and circulation management- Need and importance; marketing-concept and circulation, affecting factors, circulation manager, function of circulation department, difficulties in circulation, promoting circulation.

UNIT III

Need and concept of personnel management; role of personnel management; integration of interests, functions, human resource planning; Advertising management; Financial management- Importance of finance, financial problems, production and printing management.

UNIT IV

Significant issues in the management of broadcast media; organisational structure of radio and television in public and private sectors; Functions of various departments and personnel-production, marketing, financial, managing the station/ channel.

Practical

Visit to print, electronic and new media organisations to understand the designing, media development, organisational management, functions, problems etc.

Suggested Readings

- Bhagat R & Mathur PN. 1989. *Mass Media and Farm Women*. Intellectual Publ. House.
- Kemp JE. 1975. *Planning and Producing Audio Visual Material*. 3rd Ed. Thomas Y. Growell.
- Melkote SR. 1991. *Communication for Development in the Third World: Theory and Practices*. Sage Publ.
- Mody B. 1991. *Designing Message for Development Communication*. Sage Publ.
- Ray GL. 1991. *Extension and Communication and Management*. Naya Prakashan.

HECM 606 MONITORING EVALUATION AND IMPACT 3+0 **ASSESSMENT**

Objective

To help students to acquire knowledge, skill, appreciation in monitoring, evaluation and impact assessment.

Theory

UNIT I

Monitoring: meaning and theoretical concepts; components of project monitoring; performance appraisal standards and sustainability; approaches to participatory impact monitoring; implementation of monitoring; usefulness of monitoring-projects/reports.

UNIT II

Evaluation: meaning and theoretical concepts; criteria, steps and standards of evaluation; using models to focus evaluation; planning evaluation process; design of evaluation studies; methods of data collection.

UNIT III

Designing evaluation instruments; analysis and interpretation of evaluation data; cost effectiveness and cost benefit analysis; managing evaluation projects and writing evaluation reports; reporting and meta- evaluation (evaluation of evaluation); utilization of evaluation results, other issues, trends and course evaluation.

UNIT IV

Impact assessment techniques: concepts and process; domains of impacts; levels of impact assessment; approaches in development programme; types, criteria and; indicators of impacts; impact, monitoring, methods 'and designs; impact assessment perception of partners; techniques of analysis of impact assessment; policy implication of impact assessment.

Suggested Readings

- Andrews Cochin Mac & Sien, Chia Un (Ed.). 1986. *Too Rapid Rural Development: Perceptions and Perspectives from South East Asia*. Ohio Univ. Press.
- Bhattacharya Sid Nath 1983. *Rural Development in India and Other Developing Countries*. Parashar Printers.

- Chaturvedi HR & Mitra SK 1986. *Citizen Participation in Rural Development*. Oxford & IBH.
- Desai DK.1983. *Management in Rural Development*. Oxford & IBH.
- Jain SC. 1985. *Rural Development Institutions and Strategies*. Rawat Publ.
- Long N. 1976. *Introduction to the Sociology of Rural Development*. ELBS & Javistock Publ.
- Mathew T. 1984. *Rural Development in India*. Agri-Sole Publ. Academy.
- Mehra Rekha & Saradmoni K. 1983. *Women and Rural Transformation*. Concept Publ.
- Mehta SR. 1972. *Emerging Pattern of Rural Development*. Wiley Eastern.
- Panchanadikar KC & Panchandaikar Z.1985. *Rural Modernisation in India (A Study in Developmental Infrastructure)*. Popular Prakashan.
- Papola TS. 1982. *Rural Industrialisation (Approaches and potential)*. Himalaya Publ. House. Quaraishi MA.1985. *Indian Agriculture and Rural Development*. BR. Publ. Corp.
- Seetharamu AS. 1980. *Education and Rural Development*. Ashish Publ. House.
- Shabbir Cheema C. 1985. *Rural Development in Asia*. Sterling Publ.
- Shah SA. 1977. *Rural Development Planning and Reforms*. Abhish Publ.
- Swaminathan MS.1982. *Science and Integrated Rural Development*. Concept Publ.
- Tiwari J. 1984. *Rural Development Administration: Perspectives and Prospects*. Chugh Publ.
- Vivakananda M. 1980. *Planning Unit Areas for Integrated Rural*. Ashish Publ. House.

HECM 607 ADVERTISING AND MARKETING COMMUNICATION 1+1

Objective

To help the students to know the concept, evaluation, history, classification, various media for advertising, socio-economic effects of advertising, trends in advertising and marketing, govt. policy on advertising and marketing and to develop competency in creating advertisements for mass communication.

Theory

UNIT I

Evaluation and history of advertising, relevance of advertising in marketing, an overview of the advertising scene in India.

UNIT II

Classification of advertising; various media for advertising, advertising writing process; law and ethics in advertising, socio-economic effects of advertising.

UNIT III

Advertising agency, operations/management , an understanding of key issues, strategies in advertising, govt. policy on advertising and management, apex bodies in advertising.

UNIT IV

Advertising as a tool of marketing and Advertising campaigns and their role in marketing; Marketing communication - concept and functions, consumer behaviour and its various factors; recent trends in advertising and marketing.

Practical

Visit to advertising agencies, advertising layout techniques for newspaper, radio, posters, TV, hoardings, wall paintings, case studies on institutional advertisement, advertisement campaign.

References

- Chunawala SA 2003. *Advertising an Introductory Text*. Himalaya Publ. House.
- Derek Townsend 1993. *Advertising and Public Relations*. Alvin Rednam.
- Ganesh S. 2005. *Introduction to Advertising*. Radha Publ.
- Thomas CO Grim, Allen CT & Richard J Semenik 2003. *Advertising and Integrated Brand Promotion*. Vikas Publ.
- Verma S. 2004. *Entrepreneurship and Effective Marketing*, Aavishkar Publ.

HOME SCIENCE EXTENSION & COMMUNICATION MANAGEMENT

List of Journals

- **Indian Journal of Adult Education**
 - Indian Adult Education Association, New Delhi
- **Indian Journal of Home Science**
 - Home Science Association of India, Baroda
- **Indian Journal of Social Work**
 - Tata Institute of Social Science, Deonar, Bombay
- **Indian Journal of Training and Development**
 - Indian Society for Training and Development, New Delhi.
- **Journal of Indian Education**
 - NCERT, New Delhi
- **Journal of Rural Development**
 - National Institute of Rural Development, Rajendranagar, Hyderabad
- **Rural India**
 - Adarsh Seva Sangh, Ishwardas Mansions, Nana Chowk, Bombay, Maharashtra
- **Social Welfare**
 - Central Social Welfare Board, New Delhi
- **Indian Journal of Social Sciences**
 - Academic & Law Series, New Delhi.
- **International Journal of Home Science**
 - Academic & Law Series, New Delhi
- **Journal of Home Science Dairy & Food Science**
 - Agricultural Research and Communication Centre, Karnal, Haryana
- **Journal of Communication Studies**
 - NCDC, Banaras Hindu University, Varanasi
- **Communicator**
 - IIMC, New Delhi
- **Vidura**
 - Press Trust of India, New Delhi
- **Studies on Home and Community Studies**
 - Kamla Raj Enterprise, New Delhi

- **Journal of Human Ecology**
 - Kamla Raj Enterprise, New Delhi
- **Journal of Social Science**
 - Kamla Raj Enterprise, New Delhi
- **Indian Journal of Extension Education**
 - Indian Society of Extension Education, Division of Agricultural Extension, IARI, New Delhi
- **Maharashtra Journal of Extension Education**
 - Maharashtra Society of Extension Education, Akola
- **Rajasthan Journal of Extension Education**
 - Rajasthan Society of Extension Education Udaipur.
- **Journal of Extension.**
 - Extension Building, 432 North Lake Street Madison, Wisconsin.[e-Resources](#)
 - <http://www.uwex.edu/ces/pdande>
 - <http://www.extension.missouri.edu/staff/programdev/plm>
 - <http://www.fao.org/DOCREP/ARTICLE/WFC/XII/0346-AL.htm>
 - http://www.krishiworld.com/htm/agri_extension_edu1.html
 - <http://www.uasd.edu/extension.htm>
 - http://www.csrtimys.res.in/but_files/trg.php
 - <http://www.vedamsbooks.com/no44211.htm>
 - <http://www.flipkart.com/.../B-S-Hansara-K-Vijayarayan/8180693210/6V23F9T020.html>
 - <http://www.communicationskills.co.in/importance-of-communication-skills.htm>
 - <http://www.managementparadise.com/forums/archive/index.php/f-18918.html>
 - <http://www.hird.ap.nic.in/clic/list.html>
 - <http://www.kar.nic.in/bellary/rdpr.html>
 - <http://www.isu.edu/faculty/aclind/syllabus%204050fall%202001.htm>
 - <http://www.npandia.org/hrd.htm>
 - <http://www.firsthr.org>
 - <http://www.rocw.raifoundation.org/management/mba/HRPD/lecture-notes/lecture-os>
 - en.wikipedia.org/wiki/Corporate_communications
 - www.televisionpoint.com/news2008/newsfullstory
 - findarticles.com/p/articles/mi_hb3036/is_200210/ai_n7737881
 - books.google.co.in/books?isbn
 - [www.thebusinessedition.com/corporate-communication-strategy-in-the-new-media-corporate-blogs-394/ -](http://www.thebusinessedition.com/corporate-communication-strategy-in-the-new-media-corporate-blogs-394/)
 - papers.ssrn.com/sol3/papers.cfm?abstract_id=873348
 - www.pratapantony.com/corporate_communications.html
 - www.primepointfoundation.org/
 - www.academictutorials.com/corporate-communication
 - www.thinkingmanagers.com/business-management/corporate-communication.php
 - www.corporatecommunicationservices.com
 - www.ebizq.net/to/VITRIAPCWEBINAR
 - advice.cio.com/john_m_worthington/the_event_management_gap_the_importance_of_monitoring_intelligence_for

- www.thesportjournal.org/article/importance-expectations-participatory-sport-event-satisfaction
- www.psychwww.com/mtsite/smredimp.html
- www.webbuyersguide.com/resource/white-paper/655/Importance-of-Event-Management
- www.scmagazineus.com/Event-describes-importance-of-securing-Web-20/article/109537/
- advice.cio.com/john_m_worthington/the_event_management_gap_the_importance_of_monitoring_intelligence_for_
- en.wikipedia.org/wiki/Communicationwww.mhca.org.au/Resources/CommunityDevelopment/documents/CDEPMod1-EffectiveCommunication_ParticipantGuide.pdf
- books.google.co.in/books?isbn
- www.skagitwatershed.org/~donclark/leader/leadcom.html
- www.hss.iitb.ac.in/courses/hs490/communication.ppt
- web.cba.neu.edu/~ewertheim/interper/commun.htm
- www.hodu.com/
- humanresources.about.com/od/interpersonalcommunication1/Effective_Interpersonal_Communication.htm –
- www.mywordpower.com/
- www.earthlingcommunication.com
- www.acceptedtraining.org/ - 7k –
- www.iimidr.ac.in/iimi/pages/institute/mdpdetail.php?tid=133 - 20k
- www.sfhelp.org/pop2/ecx.htm - 18k -
- www.i2lifeseifgrowth.com/communication/written-communication-skills-ppt.php - 21k -
- www.ortmap.org/newsletters/fondas-news-2004-apr-jun.pdf
- www.icar.org.in/aeac/curricula/mHSc-2001.pdf -
- www.caen.iufm.fr/colloque_iartem/pdf/pandey.pdf
- www.nscb.gov.ph/ncs/9thncs/papers/gender_Towards.pdf
- lsr.nellco.org/cgi/viewcontent.cgi?article=1006&context=cornell/biss
- www.misu.ait.ac.th/NewsAndEvents/newsletterData/iss3no4.pdf
- mitpressjournals.org/doi/pdf/10.1162/1054204041667703
- www.nscb.gov.ph/ncs/9thncs/papers/gender_Towards.pdf

Suggested Broad Topics for Master's and Doctoral Research

- Women empowerment
- Technology assessment, refinement and transfer
- Media development, standardization and effectiveness
- Communication and media studies
- Adoption and diffusion
- Gender perspectives
- Social marketing, advertising and public relation
- Evaluation and impact assessment
- Women in agriculture

Food and Nutrition
Semester wise Course Distribution for M.Sc. Programme

S.No.	Course No.	Title	Credit Hours
<u>I - Semester</u>			
	FN 511	Advanced Food Science*	3 (2+1)
	FN 512	Food Toxicology	3 (3+0)
	FN 513	Nutrition during life cycle	3 (3+0)
	FN 514	Advanced Human Physiology	3(2+1)
	PGS-501	library & information Services (NC)	1(0+1)
	PGS-502	Technical writing & communication skills	1(0+1)
	BIOCH-525	Food and nutritional Biochemistry	3(3+0)
		Total	17
<u>II - Semester</u>			
	FN 521	Advanced Nutrition*	3(3+0)
	FN 522	Clinical Nutrition	4(2+2)
	FN 523	Nutrition and Immunity	2(2+0)
	HSc 500	Research Methods in Home Science	3 (3+0)
	STAT 501	Statistical Methods	3 (2+1)
		MINOR	3
		Total	18
<u>III - Semester</u>			
	FN 531	Food Analysis*	4 (1+3)
	FN-532	Food Processing and Technology	3(3+0)
	FN-533	Advances in community nutrition*	3(1+2)
	PGS-503	Intellectual property & its management in Agriculture(NC)	1(1+0)
	PGS-505	Agricultural Research ethics & Rural Development Programmes (NC)	1(1+0)
	FN -599	Master Research	3(3+0)
	FN- 541	Comprehensive	2(0+2)
		Total	17
<u>IV - Semester</u>			
	PGS-506	Disaster Management (NC)	1 (1+0)
	FN -591	Seminar	1
	FN- 599	Master Research	12
		Total	14

*Indicates the Core courses of the programme

Objective

To make the students aware about common food processing techniques and understand the physico-chemical properties of foods.

Theory

UNIT I

Colloidal chemistry as related to foods; evaluation of food by subjective and Objective methods. Carbohydrates in foods sources and characteristics of sugar, starch, cellulose, pectin and gums characteristics in foods; effect of cooking and processing techniques.

UNIT II

Protein in foods: Plant and animal foods; chemical and physical properties related to foods; effect of cooking and processing techniques. Properties, uses, processing techniques, changes during heating and other processing and storage of fats and oils.

UNIT III

Classification, importance, composition of fruits and vegetables and effect of cooking and other processing on their nutritive value.

UNIT IV

Classification and importance of beverages; food pigments; browning reaction. Definition, classification, uses and legal aspects of food additives; classification, nature and uses of leavening units.

Practical

Microscopic structure of different starch granules; evaluation of food by subjective and objective methods ; changes in colour , texture and flavor of foods due to processing; effect of cooking on protein , fat and carbohydrates ; product preparation using leavening agents; project work related to text .

Suggested Readings

- Borgstrom G.1968. *Principles of Food Science*.Vols.I, II. Macmillan. Desrosier NW & Desrosier JN. 1997. *The Technology of Food Preservation*.AVI Publ.
- Griswold RM. 1962.*The Experimental Study of Foods*.Houghton Mifflin Khader V. 1999 *Text Book on Food Storage and Preservation*.Kalyani. Krishna Swami K. 2000 *Nutrition Research – Current Scenario*. Oxford & IBH.
- Lowe B. 1955 *Experimental Cookery*.John Wiley & Sons. Manay NS Shadaksharaswamy M. 1997.*Foods, Facts and Principles*. New Age International.
- McWilliams M. 1993. *Foods, Experimental Perspectives*. Macmillan.
- Meyer LH. 1976 *Food Chemistry*. AVI Publ. Potter NN & Hotchkiss HJ. 1996. *Food Science*. CBS.
- Subbulakshmi G & Udipi SA. 2006. *Food Processing and Preservation*. New Age International.

Objective

To enable the students to understand the current trends in nutrition, functions, deficiencies and toxicity of different nutrients and acquaint about nutritional requirement in special conditions

TheoryUNIT I

Functions, sources, requirements, digestion and absorption of carbohydrates; definition, composition, classification, functions and role of dietary fiber in various physiological disorders.

UNIT II

Basis of requirement, functions, sources, digestion and absorption of protein; Methods of assessing protein quality .Basis of requirement, functions, sources, digestion, absorption and deficiency disorders of lipids; essential fatty acids and eicosanoids.

UNIT III

Requirements, functions, sources, deficiencies and toxicities of fat and water soluble vitamins.

UNIT IV

Requirement, functions, sources, deficiency, toxicity and factors affecting absorption and utilization of macro and micro minerals .Water balance; acid and base balance.

Suggested Readings

- Anderson L, Dibble, Turkki PR, Mitchell HS & Rynbergen HJ. 1982. *Nutrition in Health and Disease*. JB Lippincott.
- Bamji MS, Rao NP & Reddy V. 1999. *Text Book of Human Nutrition*. Oxford & IBH.
- FAO/WHO/UNU 1985. *Energy and Protein Requirement*. Tech. Report 7824, WHO.
- Guthrie HA. 1989. *Introductory Nutrition*. Times Mirror/Mosby College Publ.
- ICMR. 1990. *Nutrient Requirement and Recommended Dietary Allowance for Indians*. A Report of Expert Group of the ICMR, NIN, Hyderabad.
- James WPT & Schofield EC. 1990. *Human Energy Requirements - A Manual for Planners and Nutritionists*. Oxford University Press.
- Jelliffe DB. 1966. *The Assessment of the Nutrition Status of the Community*. WHO.
- Jolliffe N. 1962. *Clinical Nutrition*. Hoeber Medical Division.
- Khader V, Sumathi S & Manorama R. 1998. Course Manual of the Short Course on "*Recent Advances in Vitaminology*", Center for Advanced Studies, Department of Foods and Nutrition, Post Graduate and Research Centre ANGRAU, Hyderabad.
- Packer L & Funchs J. 1997. *Vitamin C in Health and Disease*, Marcel Dekker.
- Passmore R & Eastwood MA. 1986. *Human Nutrition and Dietetics*. Elbs Churchill.
- Pike RL & Brown ML. 1988 *Nutrition - An Integrated Approach*. John Wiley & Sons.

- Proceedings of the Nutrition Society of India*, NIN, Hyderabad.
 Robinson CH & Lawler MR. 1986. *Normal and Therapeutic Nutrition*.
 Macmillan.
 Shills ME, Olson JA, Shike M & Ross AC. 1999 *Modern Nutrition in
 Health and Disease*. Williams & Wilkins.
 Swaminathan MS. 1985. *Advanced Text Book on Food and Nutrition* Vols.
 I, II. The Bangalore Printing & Publ. Co

FN 531 **FOOD ANALYSIS** **1+3**

Objective

To acquaint the students with principles, techniques and application of different methods of analysis for various nutrients. .

Theory

UNIT I

Familiarization to terms and calculations used in preparation of various standard solutions. Sample and sampling techniques.

UNIT II

Principles, techniques and applications of colorimetric, spectrophotometer and atomic absorption spectrophotometer.

UNIT III

Principles, techniques and applications of spectrophotometer fluorimetry, flame photometry and electrophoresis.

UNIT IV

Principles techniques and application of chromatography (paper chromatography, TLC, GLC, HPLC). Introduction to animal assay.

Practical

Handling of equipment and instruments; preparation of samples, solutions and buffers; quantitative estimation of proximate principles, minerals and vitamins by use of colorimetry, flame photometry, UV spectrophotometer; chromatography, atomic absorption spectrophotometer and photofluorometry, analysis of antinutritional factors; estimation of protein and starch digestibility; fractionation of protein; food adulteration.

Suggested Readings

- AOAC 1995. *Association of Official Analytical Chemists*. Washington, DC.
 Gruenwedels DW & Whitakor JR 1984. *Food Analysis: Principles and
 Techniques*. Vols. I-VIII. Marcel Dekker.
 Joslyn MA. 1970. *Methods in Food Analysis: Physical, Chemical and
 Instrumental Methods of Analysis*. Academic Press.
 Pomeranz Y & Molean CE. 1977. *Food Analysis Theory and Practice*. AVI
 Publ.
 Sawhney SK & Singh R. 2000. *Introductory Practical Biochemistry*.
 Narosa.

FN 533 **ADVANCES IN COMMUNITY NUTRITION** **1+2**

Objective

To enable the students to understand the nutritional problems of the community and gain skills in planning, executing and evaluating nutrition projects of the community.

Theory

UNIT I

Assessment of the nutritional status UNIT II

Ecological, socio-cultural, economic and demographic correlations of malnutrition; prevalence, etiology, biochemical and metabolic changes in vitamin A deficiency, PEM, iron deficiency anemia, IDD.

UNIT III

Major nutritional problems of the state, nation and world. Nutrition intervention- Definition, importance, methods of nutrition intervention and their impact evaluation.

UNIT IV

National nutritional programmes and policies; nutritional surveillance. National programmes and policies regarding food production and distribution.

Practical

Market survey for food availability and their cost; development of low cost nutritious recipes suitable for various vulnerable groups; visit to the ongoing public health nutrition programme and report writing; Techniques of assessment of nutritional status.

Project Work:- Studying existing diet and nutrition practices, planning and conducting survey, analyzing data and writing report; development, implementation and evaluation of community nutrition and health programmes.

Suggested Readings

Gopaldas T & Seshadari S. 1987. *Nutrition Monitoring and Assessment*. Oxford University Press.

Jeannette B Endres. 1990 *Community Nutrition Challenges and Opportunities*. Merrill.

Jelliffe DB. 1966. *The Assessment of the Nutritional Status of the Community*. WHO.

Jolliffe N.1962. *Clinical Nutrition*. Hoeber Medical Division.

McLaren DS.1977. *Nutrition in the Community*. John Wiley & Sons.

Nutrition Foundation of India Bulletin. New Delhi.

Nutrition News. NIN, Hyderabad .

Park JE & Park K. 2000. *Text Book of Preventive and Social Medicine*. Banarsidas Bhanot Publ.

Rao BSN, Deosthale YG & Pant KC.1998 (Revised and updated). *Nutritive Value of Indian Foods* by Gopalan C, Ramashastri BV & Balasubramaniam SC. NIN, Hyderabad.

Shukla PK. 1982. *Nutritional Problems of India*. Prentice Hall of India at individual, household and institutional level: direct and indirect methods.

Objective

To know processing technology of various food stuffs, physical and chemical principles in food processing and ways of quality control, waste disposal and sanitation in food industries.

TheoryUNIT I

Principles underlying food processing operations including thermal, radiation, refrigeration, freezing and dehydration. Effect of processing on physicochemical characteristics. UNIT II

Processing technology for preservation and production of variety food products, losses during storage, handling and processing of cereals and legumes, oilseeds, fruits and vegetables.

UNIT III

Processing technology for milk and milk products, egg, meat, poultry and fish, convenience foods, processed foods. Technologies underlying in mutual supplementation, enrichment and fortification, fermentation, malting, germination. Food additives commonly used in food industries for color, flavor, and as preservatives.

UNIT IV

Quality control in food industry: raw material , finished products. Waste management and sanitation in food industries. Packaging of foods. Storage and marketing of processed foods.

Suggested Readings

- Desrosier NW & Desrosier JN. 1977. *The Technology of Food Preservation*. AVI Publ.
- Frank AP. 1987. *Modern Processing, Packaging and Distribution System for Foods*. AVI Van nonstand Reinhold Co.
- Frazier WC. 1988. *Food Microbiology*. Tata McGraw Hill.
- McWilliams M. 1993. *Foods - Experimental Perspectives*. Macmillan.
- Potty VH & Mulky MJ. 1993. *Food Processing*. Oxford & IBH.
- Srilakshmi B. 2001. *Food Science*. New Age International.
- Swaminathan MS. 1993. *Food Science and Experimental Foods*. Ganesh & Co.

Objectives:

1. To develop understanding regarding nature and biochemical role of nutrients in human body

THEORY

1. Importance and relation of bio-chemistry to nutrition
 2. Biological oxidation
 - Mitochondria, location of various enzymes, Oxidation and Reduction, Electron movement.
 - Microsomal electron transport, Electrode potential, Free energy and high energy compounds
 3. Carbohydrate
 - Classification and chemistry
 - Isomerism
 - Ring structure
 - Metabolism – Glycolysis, entry of different carbohydrate in glycolysis
 - TCA cycle, bio-synthetic pathway, gluconeogenesis from TCA cycle intermediates,
 - Glycogenesis, HMP shunt, phosphogluconate pathway (inhibitors, reversibility and regulation)
 4. Proteins
 - Classification and chemistry of proteins and amino-acids
 - Denutrition, determination of amino acid sequence
 - Protein biosynthesis
 - Protein metabolism with special emphasis on essential amino acids
 5. Lipids
 - Classification and chemistry of fats and fatty acids
 - Metabolism of triglycerides, phospholipids and cholesterol
 - Synthesis of fatty acids
 - Alpha, Beta and omega oxidation of fatty acids
 6. Nucleic acids
 - Importance, DNA and RNA structures, short hand representation, hydrolysis (acids, base and enzymatic) DNA replications
 7. Enzymes
 - Classifications, mechanism of action, specificity
 - Factors affecting rate of enzyme reaction, order of reaction and enzyme inhibition
 8. Vitamins as coenzyme, prosthetic group and cofactors, reactions Involved
 9. Water, acid-base balance and buffers
 10. Hormones
 - Importance
 - Classification and chemistry
 - Biochemical role
 - Mechanism of action
-

Suggested Readings

1. Bell, G.H., Davidson, J.N. and Smith, D.E. 1972 Textbook of Physiology and Biochemistry. The English Language Book Society, Churchill Livingstone, London.
 2. Cantarow, A. and Schepartz, B. 1967. Biochemistry. W.B. Saunders Company. Philadelphia & Toppan Company, Tokyo.
 3. Conn, E.E. and Stumpf, P.K. 1976. Outlines of Biochemistry. Wiley Eastern Ltd., New Delhi.
 4. Fruton, J. and Simmonds, S. 1958. General biochemistry. Asia Publishing House, Bombay.
 5. Murray, R.K., Granner, D.K., Mayes, P.A., and Rodwell, V.W. 1996, Harper's Biochemistry. (24th Edition) Prentice-Hall of Indian Pvt. Ltd., New Delhi.
 6. Lehninger, A.L. 1984. Biochemistry. Kalyani Publishers, New Delhi.
 7. West, E.S., Todd, W.P., Masor, H.S. and Van Bruggen, J.T. 1966. Biochemistry. Amerind Publishing Co., New Delhi.
 8. White, A., Handler P. and Smith, E.L. 1964. Biochemistry. McGraw Hill Book Co., New York and Kogakusha Co., Ltd., Tokyo.
-

FN 522

CLINICAL NUTRITION

2+2

Objective

To familiarize students about estimation of RDA, deficiency of nutrients, estimation of different nutrients and metabolites in normal and diseased conditions.

Theory

UNIT I

Methods for estimating requirements and recommended allowances of energy, protein, minerals and vitamins for different age groups and physiological states.

UNIT II

Nutrient interrelationship; historical background, epidemiology, preventive and therapeutic measures of protein energy malnutrition.

UNIT III

Interrelationship, etiology and preventive measures of vitamin and mineral deficiencies toxicities.

UNIT IV

Principles and interpretation of clinical laboratory methods with particular emphasis on their interpretation relative to nutritional status and disease; interaction between nutrients, infections and drugs.

Practical

Biochemical analysis of blood under normal and diseased conditions for glucose, calcium, iron, creatinine, urea, uric acid, creatinine, albumin, globulin, cholesterol, phosphate, glutamate oxaloacetate transaminase, glutamate pyruvate transaminase; phospholipids; analysis of urine for specific metabolites under normal and diseased conditions.

Suggested Readings

- Anderson L, Dibble MV, Turkki PR, Mitchel HS & Rynbergen H. 1982. *Nutrition in Health and Disease*. JB Lippincott Co.
- ICMR 1998. *Recommended Dietary Allowance for Indians*. ICMR.
- Khanna K, Gupta S, Seth R & Puri S. 1997. *Text Book of Nutrition and Dietetics*. Phoenix Publ.
- Oser H. 1969. *Physiological Chemistry*. Tata McGraw Hill.
- Raghuramalu N, Nair KM & Kali Sundram S. 1983. *A Manual of Laboratory Techniques*. NIN Hyderabad.
- Srilakshmi B. 2002. *Nutrition Science*. New Age International.
- Swaminathan M. 1988. *Principles of Nutrition and Dietetics*. BAPPCO.

FN 513

NUTRITON DURING LIFE CYCLE

3+0

Objective

To enable the students to know physiological changes and nutritional requirements during various stages of life cycle.

Theory

UNIT I

Adulthood: sex, occupation, income. Pregnancy: physiological changes in pregnancy, weight gain during pregnancy, food and nutrient requirements, storage of nutrients during pregnancy and impact of good nutrition on the outcome of pregnancy, complications of pregnancy and their nutritional management. Lactation: Physiology of lactation, impact of nutrition on efficiency and milk production, food and nutrient requirements during lactation.

UNIT II

Infancy: role of nutrition on physical and mental development, rate of growth - weight as an indicator, assessment of growth, nutrient requirement during infancy, feeding of infants – value of breast feeding, breast milk composition, breast feeding Vs artificial feeding, types of milk and their use in infant feeding, methods of formula preparation, weaning and supplementary foods, weaning practices in the community, special nutritional concern in infant feeding, feeding the premature and low birth weight infants. Nutritional disorders and common ailments in infancy, feeding the sick child, immunization schedule and growth charts.

UNIT III

Preschool age: growth and development – Physical and mental, prevalence of malnutrition in preschool years and food habits, nutritional requirements during preschool year and supplementary foods. School age: growth and development, nutritional requirements of school age children, specific problems in feeding school children.

UNIT IV

Adolescence: physical and physiological changes, nutritional requirements of adolescents, Food preferences and nutritional problems. Elderly: physical and physiological changes, nutritional requirement, problems of old age, nutrients influencing aging process.

Suggested Readings

- Anderson L, Dibble MV, Turkki PR, Mitchell HS & Rynbergen HJ. 1982. *Nutrition in Health and Disease*. JB Lippincott Co.
- Beal VA. 1980. *Nutrition in the Life Span*. John Wiley & Sons.
- Falkner F & Tanner JM. 1978. *Human Growth*. Vols. I-III. Plenum Press.
- FAO/WHO/UNU. 1985. *Energy and Protein Requirement*. Tech. Report 724. WHO.
- Ghosh S. 1988. *The Feeding and Care of Infant and Young Children*. Voluntary Health Association of India, New Delhi.
- Guthrie HA. 1989. *Introductory Nutrition*. Times Mirror/Mosby College Publ.
- ICMR. 1990. *Nutrient Requirement and Recommended Dietary Allowance for Indians*. A Report of Expert Group of the ICMR, NIN, Hyderabad.
- Khetarpaul N, Katyal Sudha K & Grover I. 2001 *Infant Health and Nutrition*. Agro Tech. Publ. Academy.
- Krause MV & Mahan LK. 1990. *Food, Nutrition and Diet Therapy*. WB Saunders.
- Robinson CH & Lawler MR. 1986. *Normal and Therapeutic Nutrition*, McMillan.
- Williams SR, Worthington RS, Snehlinka ED, Pipes P, Ress JM & Mahal KL. 1988. *Introduction Nutrition throughout the Life Cycle*. Times Mirroe/Mosby College Publ.

FN 512

FOOD TOXICOLOGY

2+0

Objective

To enable the students to understand the toxic substances present in the foods and processing techniques for removal of toxins from foods.

Theory

UNIT I

Introduction and significance of food toxicology. Food poisoning: types, causative factors, preventive symptoms, natural food toxins, antinutritional factors, other food toxins, harmful effects, methods of removal.

UNIT II

Microbial toxins and food intoxications. Source of contamination Effect on health, preventive measures, methods of inactivation/destruction. UNIT III

Chemical toxins: Pesticides, insecticides metallic and others, residual effects, preventive measures, methods of removal.

UNIT IV

Food packaging material, potential contaminants from food packaging material. Food laws and standards: FPO, ISI, Ag Mark, Codex Alimentarius, ISO, mark for vegetarian and non vegetarian foods, ecofriendly products and others in operation.

Suggested Readings

- Ayres JC. 1968. *The Safety of Foods*. AVI Publ.
- Hayes WJ. 1975. *Toxicology of Pesticide*. The Willams & Wilkins Co.
- Jacob T. 1976. *Food Adulteration*. Sib Wasani Macmillan Co.
- Swaminathan MS. 1985. *Advanced Text Book on Food and Nutrition*. Vol II. The Bangalore Printing & Publ. Co.

FN 514

ADVANCED HUMAN PHYSIOLOGY

2+1

Objective

To enable the students to understand the anatomy and functions of human body and techniques/methods of blood and urine analysis.

Theory

UNIT I

Reticulo- endothelial system: functions, classification. Lymphatic system: functions, circulation. Circulatory System: blood - composition blood cells - development and function of blood cells, blood clotting, blood grouping and hemoglobin, Heart: anatomy, cardiac cycle, blood pressure and factors affecting blood pressure.

UNIT II

Respiratory system: anatomy, physiology and mechanism of respiration, regulation of respiration. Digestive system: anatomy of gastrointestinal tract and accessory organs. Digestion and absorption of food, regulation of appetite.

UNIT III

Excretory system: anatomy and functions of kidney, formation, composition and excretion of urine. Endocrine glands, mode of action of hormones.

UNIT IV

Reproductive system: structure and functions of male and female reproductive organs. Nervous system: anatomy and functions, Musculo skeletal system: anatomy and functions.

Practical

Estimation of hemoglobin. Identification of blood groups. Preparation of blood slide, identification and counting of blood cells. Haematocrit and sedimentation rate. Measurement of blood pressure. Examination of abnormal constituents of urine Estimation of glucose and cholesterol in blood.

Suggested Readings

Best CH & Taylor NB. 1989. *The Human Body*. ASI Publ. House. (Source: National Book Depot, Bombay).

Chatterjee CC. 1992. *Human Physiology*. Vols. I , II. Medical Allied Agency.

FN 523

NUTRITION AND IMMUNITY

2+0

Objective

To make the students understand the importance of various nutrients in maintaining and improving the immunity of individuals.

Theory

UNIT I

Immunity: definition and history. Classification, immunological responses, cell types involved. Mechanism of phagocytosis and antigen-antibody reactions. Regulation of immunity. Mucosal defence system- effect of nutrients.

UNIT II

Effect of malnutrition on immunity. Carbohydrates and immune system. Fat and immune system- factors affecting acquired immunity. Protein and immune functions- effect of arginine, glutamine and sulphur amino acids. Glutathione and immune system.

UNIT III

Role of vitamins in immune functions-effect of deficiency. Role of minerals-effect of deficiency and excess on immune cell functions.

UNIT IV

Probiotics and antioxidants – their effect on immune function. Immunity against infection – role of immunization.

Suggested Readings

David A, Darlington G & Bendich A. 2004. *Diet and Human Immune Function*. Humana Press.

Huffer T, Kanapa T & Stevenson GW. 1986. *Introduction to Human Immunology*. Jones & Bartlett.

Wise DJ & Carter GR. 2004. *Immunology - A Comprehensive Review*. Iowa State University Press, Blackwell Science Co.

Department of Food and Nutrition
Course programme for Ph.D.

A. Major Courses			15 Credit Hours
I Core Courses			9 Credit Hours
1.	FN-611	Advances in Carbohydrates, Proteins and Lipids	4(3+1)
2.	FN-621	Advances in Vitamins and Hormones	2(2+0)
3.	FN-631	Minerals in Human Nutrition	3(2+1)
II Optional Courses			6 Credit Hours
1	FN-612	Maternal and Child Nutrition	3(2+1)
2	FN-622	Advances in Food Sciences and Technology	3(2+1)
B. Supporting Courses			14 Credit Hours
1	BIOCH-531	Techniques in Biochemistry	3(2+1)
2	HORT-532	Post Harvest Technology of Fruit Crops	3(2+1)
3	HORT-513	Production Technology of Warm Season Vegetable Crops	3(2+1)
4	STAT-600	Data Processing	2(1+1)
5	HSc-600	Research Project Management	3(2+1)
C.	FN-641	Comprehensive	4
D. Seminar			2 Credit Hours
1	FN-691	Seminar-I	1
2.	FN-692	Seminar-II	1
E.	FN-699	Doctoral Research	45 Credit Hours
Grand Total		A+B+C+D+E	80 Credit Hours

Non supporting compulsory Courses			
1.	PGS-501	Library and Information Services	1(0+1)
2.	PGS-502	Technical Writing and Communication Skills	1(0+1)
3.	PGS-503	Intellectual Property and its Management in Agriculture	1(1+0)
4.	PGS-505	Agricultural Research Ethics and Rural Development Programme	1(1+0)
5.	PGS-506	Disaster Management	1(1+0)

Objective

To acquaint the students with recent developments in the role of carbohydrates, proteins and lipids in normal and diseased conditions.

TheoryUNIT I

Carbohydrates, proteins and lipids-their digestion, absorption, metabolism. Inborn errors of metabolism.

UNIT II

Metabolic disorders-diabetes, dental caries, obesity, atherosclerosis, hyperlipidemias and hypertension. Glucose homeostasis determined by insulin/glycogen ratio; carbohydrates free diet and its metabolic consequences; glycolic index; dietary fiber- its definition, composition, classification, functions and role in various physiological disorders.

UNIT III

Classification of protein, new discoveries in protein and their functions such as protein in Immune system, as lubricants, biological buffers and carriers, evaluation of protein quality: in vitro and in vivo methods, animal and human bioassays: amino acid pool, protein turnover in man with special reference to body size, age and various nutrition and pathological conditions, regulation of proteins, requirements; novel food sources of protein. Effect of insulin, corticosteroids, thyroids, androgen and growth hormone on protein metabolism, inheritable disorders of amino acid metabolism of protein; effect of dietary protein on cardiovascular disease and cholesterol metabolism, adaptation of body to low intake of energy and protein.

UNIT IV

Estimation of body fat; lipoproteins and hyper lipoproteinemia; hypolipidemic action of PUFA omega-3 fatty acids and oxidation products of cholesterol; lipids and cancer; fish oils in health and disease; oxidation products of cholesterol. Disturbance in lipid metabolism; role of reversal diet in cardiovascular disorders; high blood cholesterol – causes, prevention and treatment; hypolipidemic action of rice bran, oat, barley and legumes.

Practical

Assessment of protein quality; project work related to metabolic disorders of proximate principles; blood analysis in relation to NCD and estimation of amylase and protease inhibitors in foods.

Suggested Readings

- Akoh CC & Min DB. 1998. *Food Lipids - Chemistry, Nutrition and Biotechnology*. Marcel Dekker.
- Berdenier CD. 1976. *Carbohydrate Metabolism - Regulation and Physiological Role*. John Wiley.
- Bodwell CE. 1979. *Evaluation of Protein for Human*. AVI Publ.
- Dickens F. *Carbohydrate Metabolism and its Disorder*. Vol. II. Academic Press.

UNIT II

Nutritional requirements, methods of assay of all the minerals. Interactions of minerals with other nutrients, antagonists and analogues of minerals.

UNIT III

Assessment of mineral status of population, mineral fortification and supplementation; major mineral pollutants- their harmful effect to health; mutagenicity, carcinogenicity, teratogenicity, heavy metal toxicity. Use of mineral isotopes/ tracers in nutritional studies.

UNIT IV

Metallozymes; antioxidants and their relationship with aging, cancer and other metabolic disorders. Heavy metal toxicity; trace minerals, their chronology, chemistry, distribution, functions, absorption, metabolism, requirements, deficiency manifestation and interaction.

Practical

Assessment of antioxidants in foods; Project to combat micro nutrient deficiencies- Vulnerable sections, Groups with special needs.

Suggested Readings

- Basu TK & Dickerson JWT. 1996. *Vitamins in Human Health and Disease* CABI.
- Boyd LO' Dell & Sunde RA. 1997. *Handbook of Nutritionally Essential Mineral Elements*. CRC Press.
- Causing 2005. *Annual Review of Nutrition*. Vol. 25.
- Comb GF. 1992. *The Vitamins, Fundamental Aspects in Nutritional and Health*. Academic Press.
- Kutsky RJ. 1981. *Handbook of Vitamins of Minerals and Hormones* NRC.
- Machlin LJ. 1991 *Handbook of Vitamins*. Marcel Dekker.
- Monier Willam GW. 2008. *Trace Elements in Foods*. Agribios.
- Taylor SL. 2007 *Advances in Food and Nutrition Research*. Vols. 1-52. Research Books & Pvt. Ltd.

FN 612

MATERNAL AND CHILD NUTRITION

2+1

Objective

To enable the students to understand the role of nutrition during pregnancy, lactation and infancy.

Theory

UNIT I

Current scenario of maternal and child nutrition; Nutritional aspect of embryogenesis; Factors affecting outcome of pregnancy; Physiological changes in body composition and mental development in relation to prenatal and postnatal nutrition .

UNIT II

Effect of nutritional status of mother on quantity and quality of breast milk; recent guidelines in infant feeding and complementary feeding. Feeding of premature babies; HIV and breast feeding; drug abuse and breast feeding.

UNIT III

Nutritional problems and requirements of preschool and school going children; growth and development of children; growth monitoring using growth charts.

Suggested Readings

- Manay NS & Shadaksharaswamy 1997. *Food Facts and Principles*. New Age Publ.
- Potter N & Hotchkiss JH. 1996. *Food Scienc* . 5th Ed. AVI Book Van.
- Potty VH & Mulky MJ. 1993. *Food Processing*. Oxford & IBH.
- Srilakshmi B. 2002. *Nutrition Science*. New Age Publ..
- Swaminathan MS. 1993. *Food Science and Experimental Foods*. Ganesh & Co.

FOODS AND NUTRITION

List of Journals

- **Plant Foods for Human Nutrition**
 - Kluwer Academic Publisher, P.O. Box 322, 3300, AH Dordrecht, The Netherland
- **Journal of Food Science and Technology**
 - Association of Food Scientists, CFTRI, Mysore 570013 (India)
afsti@soncharnet.in
- **Nutrition and Food Science**
 - www.emeraldinsight.com/authors
- **Food Chemistry**
 - Professor Gordon Birch, School of Food Biosciences, University of Reading, Whiteknights, Po Box 226, Reading RG6 6AP, UK
- **Journal of Human Nutrition and Dietetics**
 - Dr. Joan Gandy, Centre for Health Studies, Buckinghamshire Chilterns University College Gorelands Lane, Bucks, HP84AD, UK
- **International Journal of Food Science and Technology**
 - wtp://mc.manuscriptcentral.com.ijfst
- **Journal of Indian Dietetic Association**
 - Editor-in-chief, Department of Biochemistry & Nutrition, All India Institute of Hygiene and Public Health, 110 C.R. Avenue, Kolkata – 700 073
- **International Journal of Food Science and Technology**
 - Blackwell Publishing Ltd. 9600 Garsington Road, Oxford, Ox42D.
- **Indian Food Packer**
 - K.P. Sareen, Executive Editor, All India Food Processors Association, 206, Aurobindo Place, Havzkhas, New Delhi
- **Trends in Food Science and Technology**
 - Elsevier Ltd., The Boulevard, Langfordlane, Kidlington, Oxford OXs 1GB, UK
- **European Journal of Clinical Nutrition**
 - JC Seidell, Free University, Amsterdam, The Netherlands.
- **Association of Food Scientists and Technologists (India) Mysore**
 - E-mail: aftsi@sancharnet.in. www.aftsi.org.
- **Journal of the Science of Food and Agriculture**
 - www.interscience.welley.com/jsfa

e-Resources

- www.eatright.org/
- www.fda.gov/search.html
- www.nutrition.about.com
- www.lifelines.com/ntnlnk.html
- www.fda.gov
- www.nal.usda.gov/fnic/dga
- www.nal.usda.gov/fnic/fpyr/pyramid.html
- www.diabetes.org
- www.5aday.com
- www.ifinfo.health.org/infoFN.htm
- www.fascb.org/asns/intro.html
- www.osteoporosis.org
- www.ironoverload.org
- www.bookman.com.au/vitamins
- www.thriveonline.com/eats/vitamins/guide.index.html
- www.altmedicine.com/
- www.ncahf.org
- www.nal.usda.gov/fnic/foodcomp
- www.niddk.nih.gov/health/nutrit/nutrit.htm
- www.fda.gov/cder
- www.acsm.org
- www.cdc.gov/nccdphp
- www.nih.gov/od/oar
- www.americanheart.org
- www.nhlbi.nih.gov/index/htm
- www.cancer.org
- www.aice.org
- www.eatright.org/nfs42.html
- www.foodsafety.org
- www.safefood.org
- www.fao.org
- www.who.org/nut
- www.wfp.org
- www.worldbank.org

Suggested Broad Topics for Master's and Doctoral Research

- Diet and nutrition surveys of vulnerable sections of specific district
- Nutritional improvement and utilization of pearl millet and soybean in Indian dietaries
- Weaning/supplementary mixture for infants and pre school children
- Value added products from cereals and pulses
- Development and nutritional evaluation of β -carotene and iron rich products from amaranth, fenugreek, spinach and unconventional vegetables
- Development of foods for diabetes and old persons
- Development of fiber rich food products
- Development and nutritional evaluation of probiotic foods for controlling diarrhea
- Development and nutritional evaluation of value added products supplemented with crude palm oil and the vegetable oils
- Development and nutritional evaluation of value added products using medicinal plants and to test their efficacy against blood sugar and cholesterol level in animals and human beings
- Nutritional evaluation of under-utilized foods of India and incorporation in traditional diets to improve their nutritional quality
- Dietary survey of patients suffering from various diseases like, heart disease, liver disease, kidney disorder etc.
- Nutritional evaluation of new crop varieties and preparation of value added products.

SUPPORTING COURSES

M. Sc.

HSC 500 RESEARCH METHODS IN HOME SCIENCE 3+0

Objective

To understand the meaning and importance of research, research procedures and develop skills in designing and executing research.

Theory

Research – Meaning and Importance; Types of Research; Qualities of Researcher; Steps of Research; Selection and delineating of research problem, statement of general and specific Objective, formulation of assumptions and hypothesis, planning research design, selection and development of data collection tools, collection of data, analysis and interpretation of data, drawing conclusion, writing research report. Understanding some concepts in research; Assumption, delimitations, operational definition, Measurement and its levels, Variable and their types. Hypothesis – Meaning, importance, characteristics and ways of stating hypothesis. Review of literature – Importance, sources of literature, organizing review, collection and presentation. Research Design; Historical or documentary, Experimental, Ex-post-facto, Survey, Case study, Field studies. Sampling – Meaning and importance; Sampling techniques, determine size of sample. Techniques of data collection; Observation, interview and questionnaire, Projective technique. Scale and tests – Meaning and construction; validity and reliability of tools. Data analysis – tools and methods, interpretations of data, documentation and presentation. Summary, conclusion and recommendations; Writing abstract. The research report; Formal style of writing, chapterisation, heading, pagination, Tables and figures, Appendices and bibliography, acknowledgement. Writing for publications

Suggested Readings

Bajpai SR. 1966. *Methods of social Survey and Research*. Kitab Ghar.
Best W. 1983. *Research in Education*. 4th Ed. Prentice Hall of India.
Carter Good V. 1966. *Essential of Education Research*. Appleton Century Profits, Educational Division, Mereelith Corp.
Kaul Lokesh 1984. *Methodology of Education Research*. Vikas Publ.
Kerlinger F. 1973. *Foundations of Behavioural Research*. Rinehart Winetons.

STAT 500 STATISTICAL METHODS 2+1

Objective

To develop understanding among students about sampling and data analysis techniques, methods of data analysis using various statistics.

Theory

Probability and probability distribution: Various definitions of probability, Addition and multiplication laws of probability and simple problems based on them. Expectation of a random variable, Moments, Skewness and Kurtosis. Binomial and Poisson distribution, their fitting and simple problems based on them, Normal distribution, their properties and uses. Sampling: Sampling v/s Complete enumeration, Probability and non

probability sampling, S.R.S. with and without replacement. Test of significance: Hypothesis, null and Alternative hypothesis, type-I and type-II error, Level of significance, Critical region, one and two tailed tests, Procedure for testing of hypotheses. Standard Normal deviate test for single mean, difference of two means. Proportion, difference of proportion and confidence interval, students 't' test, for comparison involving one and two sample means, paired 't' test, Confidence interval, Chi-square test for goodness of fit and independence of two attributes (2x2 and r x s contingency table) and Yate's correction for continuity, Correlation and Regression : Simple and partial correlation coefficients, Linear and multiple regressions. Partial regression coefficients, multiple correlation coefficients and their tests of significance. Design of Experiments : Analysis of C.R.D., R.B.D. and L.S.D. with one observation per cell.

Practical

Simple problem based on probability, Simple problems based on Binomial, Poisson and Normal distribution. Problem based on area tables of Normal distribution. Draw simple random-sample of size 'n' from a given population of size 'N' with and without replacement scheme and obtain the estimate of (i) population mean (ii) population variance and (iii) standard error. Standard normal deviate tests for testing (i) $\mu = \mu_0$, (ii) $\mu_1 = \mu_2$, 't'-test for testing (i) $\mu = \mu_0$, (ii) $\mu_1 = \mu_2$, Confidence interval for means, for small and large samples. Chi-square test for goodness of fit. Chi-square test for independence of two attributes, 2x2, r x s contingency table and Yates' correction. Fitting of Regression line (i) $Y = a+bX$ and test for $y_x = 0$ (ii) $Y = a+b_1x_1 + b_2x_2$. Partial correlation coefficients and its tests of significance. Multiple correlation coefficient and its test by F-test

Suggested Readings

- Gupta SC & Kapoor VK. 2006. *Fundamentals of Mathematical Statistics*. Sultan Chand & Sons.
- Gupta SC. 2006. *Fundamentals of Statistics*. Himalaya Publ. House.
- Panse VG & Sukhatme PV. 1985. *Statistical Methods for Agricultural Workers*. ICAR.
- Rao GN. 2007. *Statistics for Agricultural Science*. Oxford & IBH.
- Snedecor GW & Cochran WG. 1968. *Statistical Methods*. Oxford & IBH.
- Sukthame & Ashok C. 1984. *Sampling Theories and Surveys with Application*. 3rd Ed. ICAR.

Ph. D.

HSC 600

RESEARCH PROJECT MANAGEMENT

2+1

Objective

To enable the students to prepare and execute research project and develop skill in managing research data, its interpretation, report writing, popular communication and research paper writing.

Theory

Importance of research in Home Science; Research Management-Concept, process, elements and characteristics; Research methodologies for field and laboratory studies- problem selection, research designs, sampling, data collection, statistical methods - their uses and limitations; Criteria for selecting research project; planning project proposal- statement of problem

and its justification and implication. Technical plan of work, time estimation and scheduling, preparing project work flow, resource requirement- human, material and others, cost estimation and budget; project review techniques; project estimation and evaluation; reporting results of research; holistic and interdisciplinary approach to research management; data processing- collection, statistical analysis, interpretation of results and drawing generalizations; funding agencies for research project- different national and international agencies, guidelines for preparing the proposal; project appraisal techniques and SWOT analysis, conflicts- concept, process and types; managing conflicts, resource smoothing in research project; factors influencing research efficiency; monitoring and control of research project- concept and techniques; scientific research communication- writing research paper, popular articles and technical report.

Practical

Critical review and SWOT analysis of any two research projects with respect to – Research Objective and design, Implementation, Monitoring and evaluation system and impact assessment; Planning a research project in view of funding agency; Writing at least one – Research paper, Review paper, Popular article, Technical report.

Suggested Readings

Bajpai SR. 1969. *Methods of Social Survey and Research*. Kitab Ghar.
 Best W. 1983. *Research in Education*. 4th Ed. Prentice Hall of India.
 Carter Good V. 1966. *Essential of Education Research*. Appleton Century Profits, Educational Division, Mereelith Corp.
 Kaul L. 1984. *Methodology of Educational Research*. Vikas Publ.
 Kerlinger F. 1973. *Foundations of Behavioural Research*. Rinehart Winetons.

STAT 600 DATA PROCESSING 1+1

Objective

To develop understanding about data processing techniques and enable students in handling, analyzing and presentation of data.

Theory

Data processing- Concept and technique, Graphical presentation of data, Computer application in data processing.

Practical

Practicing various techniques of data processing and presentation of data through computer.

Suggested Readings

Bajpai SR. 1969. *Methods of Social Survey and Research*. Kitab Ghar.
 Carter Good V. 1966. *Essential of Education Research*. Appleton Century Profits, Educational division, Mereelith Corp.

COMPULSORY NON-CREDIT COURSES

(Compulsory for Master's programme in all disciplines; Optional for Ph.D. scholars)

CODE	COURSE TITLE	CREDITS
PGS 501	LIBRARY AND INFORMATION SERVICES	0+1
PGS 502	TECHNICAL WRITING AND COMMUNICATIONS SKILLS	0+1
PGS 503 (e-Course)	INTELLECTUAL PROPERTY AND ITS MANAGEMENT IN AGRICULTURE	1+0
PGS 504	BASIC CONCEPTS IN LABORATORY TECHNIQUES	0+1
PGS 505 (e-Course)	AGRICULTURAL RESEARCH, RESEARCH ETHICS AND RURAL DEVELOPMENT PROGRAMMES	1+0
PGS 506 (e-Course)	DISASTER MANAGEMENT	1+0

Course Contents

PGS 501 LIBRARY AND INFORMATION SERVICES 0+1

Objective

To equip the library users with skills to trace information from libraries efficiently, to apprise them of information and knowledge resources, to carry out literature survey, to formulate information search strategies, and to use modern tools (Internet, OPAC, search engines etc.) of information search.

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; e-resources access methods.

PGS 502 TECHNICAL WRITING AND COMMUNICATIONS SKILLS 0+1

Objective

To equip the students/scholars with skills to write dissertations, research papers, etc.

To equip the students/scholars with skills to communicate and articulate in English (verbal as well as writing).

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
(e-Course)

**INTELLECTUAL PROPERTY AND ITS
MANAGEMENT IN AGRICULTURE**

1+0

Objective

The main objective of this course is to equip students and stakeholders with knowledge of intellectual property rights (IPR) related protection systems, their significance and use of IPR as a tool for wealth and value creation in a knowledge-based economy.

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-

Objectives

To introduce learners to the key concepts and practices of natural disaster management; to equip them to conduct thorough assessment of hazards, and risks vulnerability; and capacity building.

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.