# COLLEGE OF HOME SCIENCE

## PG and Ph.D Syllabus

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

#### Semester I

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

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Course No.</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>HECM -502</td>
<td>Training and Human resource Development</td>
<td>3(1+2)</td>
</tr>
<tr>
<td>2.</td>
<td>HECM - 507</td>
<td>Extension Management</td>
<td>2(2+0)</td>
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<tr>
<td>3.</td>
<td>Minor</td>
<td></td>
<td>3</td>
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<td>4.</td>
<td>HSc -500</td>
<td>Research Methods in Home Science</td>
<td>3(3+0)</td>
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<tr>
<td>5.</td>
<td>STAT -501</td>
<td>Statistical Method</td>
<td>3(2+1)</td>
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<tr>
<td>6.</td>
<td>HECM -508</td>
<td>Corporate Communication and event Management</td>
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#### Semester III

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

<table>
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<th>S.No.</th>
<th>Course No.</th>
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<th>Credit Hours</th>
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<tbody>
<tr>
<td>1.</td>
<td>HECM - 591</td>
<td>Seminar</td>
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<td>HECM - 541</td>
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<td>3.</td>
<td>PGS-506</td>
<td>Disaster Management (NC)</td>
<td>1(1+0)</td>
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<tr>
<td>4.</td>
<td>HECM -599</td>
<td>Master Research</td>
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</tbody>
</table>
### Semester I

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Course No.</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>HECM - 601</td>
<td>Recent trends in extension and communication (MAJOR)</td>
<td>3(3+0)</td>
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<td>2.</td>
<td>HECM - 606</td>
<td>Monitoring evaluation and impact assessment (MAJOR)</td>
<td>3(3+0)</td>
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<td>STAT-600</td>
<td>Data processing (SUPPORTING)</td>
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<td>6.</td>
<td>PGS-506</td>
<td>Disaster management (NC)</td>
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### Semester II

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<tbody>
<tr>
<td>1.</td>
<td>HECM -607</td>
<td>Advertising and marketing communication (MAJOR)</td>
<td>2(1+1)</td>
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<tr>
<td>2.</td>
<td>HECM - 603</td>
<td>Advanced media management (MAJOR)</td>
<td>3(2+1)</td>
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<tr>
<td>5.</td>
<td>HSc-600</td>
<td>Research project management (SUPPORTING)</td>
<td>3(2+1)</td>
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<td>6.</td>
<td>PGS -501</td>
<td>Library information services (NC)</td>
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<tr>
<td>7.</td>
<td>PGS-502</td>
<td>Technical writing (NC)</td>
<td>1(0+1)</td>
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<td>HECM -504</td>
<td>Media Production and Management</td>
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<tr>
<td>2.</td>
<td>HECM - 510</td>
<td>Educational Technology</td>
<td>3(2+1)</td>
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<td>3.</td>
<td>HECM-511ICT</td>
<td>and New Media</td>
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<td>HECM-509</td>
<td>Scientific Writing And Reporting for Media</td>
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<tr>
<td>5.</td>
<td>HECM-599</td>
<td>Master Research</td>
<td>3(3+0)</td>
</tr>
<tr>
<td>6.</td>
<td>PGS-503</td>
<td>Intellectual Property (NC)</td>
<td>1(1+0)</td>
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<td>7.</td>
<td>PGS-505</td>
<td>Agricultural Research, Research Ethics and Rural Development Programmes (NC)</td>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>HECM-591</td>
<td>Seminar</td>
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<td>2.</td>
<td>HECM-541</td>
<td>Comprehensive</td>
<td>2(2+0)</td>
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<td>3.</td>
<td>PGS-506</td>
<td>Disaster Management (NC)</td>
<td>1(1+0)</td>
</tr>
<tr>
<td>4.</td>
<td>HECM -599</td>
<td>Master Research</td>
<td>12</td>
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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
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, brainstorming, 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
Objective
To acquaint students about communication process, recent advances in communication and diffusion and help students acquire necessary communication skills.

Theory
UNIT 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
Deep & Deep Publ.
HECM 504 MEDIA PRODUCTION AND MANAGEMENT 1+2

Objective
To develop competency in production and management of different media.

Theory
UNIT 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; multimedia – concept and evolution of multimedia; fundamentals of making a multimedia 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; layout 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
Meredith GG. 1982. Practice of Entrepreneurship. ILO.
Singh N. 2003 Effective Entrepreneurship Management. Anmol Publ
Objective
To develop understanding regarding the principles, procedure and approaches of extension programme planning, implementation, evaluation of extension programme and participatory management techniques.

Theory
UNIT 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
GENDER SENSITIZATION FOR EMPOWERMENT 2+0

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

Theory
UNIT 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
HECM 507       EXTENSION MANAGEMENT       2+0

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.

Theory

UNIT 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
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.

Theory
UNIT 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
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

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

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
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
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

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

HECM 606 MONITORING EVALUATION AND IMPACT ASSESSMENT 3+0

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


**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

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**  
  o Kamla Raj Enterprise, New Delhi

• **Journal of Social Science**  
  o Kamla Raj Enterprise, New Delhi

• **Indian Journal of Extension Education**  
  o Indian Society of Extension Education, Division of Agricultural Extension, IARI, New Delhi

• **Maharashtra Journal of Extension Education**  
  o Maharashtra Society of Extension Education, Akola

• **Rajasthan Journal of Extension Education**  
  o Rajasthan Society of Extension Education Udaipur.

• **Journal of Extension**
  o Extension Building, 432 North Lake Street Madison, Wisconsin

  - http://www.uwex.edu/ces/pdande
  - http://www.extension.missouri.edu/staff/programdev/plm
  - http://www.uasde.edu/extension.htm
  - http://www.vedamsbooks.com/no44211.htm
  - http://www.communicationskills.co.in/importance-of-communication-skills.htm
  - 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
  - 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.pratapantony.com/corporate_communications.html
  - www.primepointfoundation.org/
  - www.academictutorials.com/corporate-communication
  - www.corporatecommunicationservices.com
  - www.ebizq.net/to/VITRIAPCWEBINAR
  - advice.cio.com/john_m_worthington/the_event_management_gap_the_importance _of_monitoring_intelligence_for
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

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

*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**
Khader V. 1999 *Text Book on Food Storage and Preservation*. Kalyani.

Potter NN & Hotchkiss HJ. 1996. *Food Science*. CBS.
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

Theory

UNIT 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

Suggested Readings
Proceedings of the Nutrition Society of India, NIN, Hyderabad.

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

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
Jeannette B Endres. 1990 *Community Nutrition Challenges and Opportunities.* Merrill.
Nutrition News. NIN, Hyderabad.

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.

Theory
UNIT 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.
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


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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
ICMR 1998. *Recommended Dietary Allowance for Indians*. ICMR.

FN 513 NUTRITION 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

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


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**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**


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

UNIT II

UNIT III

UNIT IV

Practical

Suggested Readings

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
UNIT II

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
# Department of Food and Nutrition

## Course programme for Ph.D.

### A. Major Courses  
15 Credit Hours

<table>
<thead>
<tr>
<th>Core Courses</th>
<th>9 Credit Hours</th>
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<tbody>
<tr>
<td>1. FN-611 Advances in Carbohydrates, Proteins and Lipids</td>
<td>4(3+1)</td>
</tr>
<tr>
<td>2. FN-621 Advances in Vitamins and Hormones</td>
<td>2(2+0)</td>
</tr>
<tr>
<td>3. FN-631 Minerals in Human Nutrition</td>
<td>3(2+1)</td>
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### II Optional Courses  
6 Credit Hours

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<thead>
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<tbody>
<tr>
<td>1. FN-612 Maternal and Child Nutrition</td>
<td>3(2+1)</td>
</tr>
<tr>
<td>2. FN-622 Advances in Food Sciences and Technology</td>
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### B. Supporting Courses  
14 Credit Hours

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<tbody>
<tr>
<td>1. BIOCH-531 Techniques in Biochemistry</td>
<td>3(2+1)</td>
</tr>
<tr>
<td>2. HORT-532 Post Harvest Technology of Fruit Crops</td>
<td>3(2+1)</td>
</tr>
<tr>
<td>3. HORT-513 Production Technology of Warm Season Vegetable Crops</td>
<td>3(2+1)</td>
</tr>
<tr>
<td>4. STAT-600 Data Processing</td>
<td>2(1+1)</td>
</tr>
<tr>
<td>5. HSc-600 Research Project Management</td>
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### C. FN-641 Comprehensive  
4

### D. Seminar  
2 Credit Hours

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<td>1. FN-691 Seminar-I</td>
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<tr>
<td>2. FN-692 Seminar-II</td>
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### E. FN-699 Doctoral Research  
45 Credit Hours

### Grand Total  
80 Credit Hours

### Non supporting compulsory Courses

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<td>1. PGS-501 Library and Information Services</td>
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<tr>
<td>2. PGS-502 Technical Writing and Communication Skills</td>
<td>1(0+1)</td>
</tr>
<tr>
<td>3. PGS-503 Intellectual Property and its Management in Agriculture</td>
<td>1(1+0)</td>
</tr>
<tr>
<td>4. PGS-505 Agricultural Research Ethics and Rural Development Programme</td>
<td>1(1+0)</td>
</tr>
<tr>
<td>5. PGS-506 Disaster Management</td>
<td>1(1+0)</td>
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</tbody>
</table>
Objective
To acquaint the students with recent developments in the role of carbohydrates, proteins and lipids in normal and diseased conditions.

Theory

UNIT 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
-Dickens F. Carbohydrate Metabolism and its Disorder. Vol. II. Academic Press.
FAO. 1998. *Carbohydrates in Human Nutrition*. FAO.


**FN 621 ADVANCES IN VITAMINS AND HORMONES 2+0**

**Objective**
To acquaint the students with role and function, metabolism and recent developments in vitamins and hormones.

**Theory**
- **UNIT I**
  General definition and history of vitamins and hormones; cause of vitamin deficiencies in India. Chronology, chemistry, distribution, functions, absorption, transport, metabolism, deficiency manifestations,
- **UNIT II**
  Nutritional requirements, methods of assay. Interaction with other nutrients, antagonists and analogues of vitamins.
- **UNIT III**
  Hypervitaminosis of water and fat soluble vitamins; vitamin fortification and supplementation; endocrine and exocrine secretion of hormones- organs of secretion, metabolism, mechanism of action, regulation and sites of action, biological effects and interaction.
- **UNIT IV**
  Assessments of vitamin status of population; antioxidants and their relationship with aging, cancer and other metabolic disorders.

**Suggested Readings**

**FN 631 MINERALS IN HUMAN NUTRITION 2+1**

**Objective**
To acquaint the students with role and functions, metabolism and recent developments in minerals.

**Theory**
- **UNIT I**
  General definition and history of minerals; causes of macro and micro mineral deficiencies in India. Chronology, chemistry, distribution, functions, absorption, transport, metabolism, deficiency manifestations.
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
Metalonzymes; 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.
Kutsky RJ. 1981. Handbook of Vitamins of Minerals and Hormones NRC.
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.
UNIT IV
Strategies to improve maternal and child health in India; role of BPNI in promotion of breast feeding in India; importance of world breast feeding week.

Practical
Preparation of a database on prevailing supplementary and weaning practices- planning, collecting data, analyzing data, writing report; preparation of low cost complementary foods. Analysis of weaning/complementary foods for its nutrient content.

Suggested Readings
NNMB Reports

FN 622 ADVANCES IN FOOD SCIENCE AND TECHNOLOGY 2+1
Objective
To acquaint the students with latest advances in nutrition and food science and food challenges in next millennium.

Theory
UNIT I
Recent advances in the field of carbohydrates, lipids, proteins, vitamins and minerals in relation to human nutrition.
UNIT II
Nutrogenomics, incorporating genetics into dietary guidance. Recent advances in the field of food analysis and food fortification.
UNIT III
Foods of future; special nutrients. Food processing and product development; regulating food processing and preservation through TQM and HACCP.

Practical
Product development and shelf life of nutritionally fortified foods using advanced technologies, field study of food processing and preservation in relation to TQM and HACCP in an industry.
Suggested Readings

FOODS AND NUTRITION

List of Journals

- **Plant Foods for Human Nutrition**
  - Kluwer Academic Publisher, P.O. Box 322, 3300, AH Dordrecht, The Netherlands

- **Journal of Food Science and Technology**
  - Association of Food Scientists, CFTRI, Mysore 570013 (India)
    - aftsi@sancharnet.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 Chiltns University College Gorelands Lane, Bucks, HP84AD, UK

- **International Journal of Food Science and Technology**
  - http://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, Langfodlane, 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.ificinfo.health.org/infoFN.htm
- www.fascb.org/asns/intro.html
- www.osteo.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
Profits, Educational Division, Mereelith Corp.
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 \( yx = 0 \) (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
Panse VG & Sukhatme PV. 1985. Statistical Methods for Agricultural Workers. ICAR.
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**
Profits, Educational Division, Mereelith Corp.
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**
Profits, Educational division, Mereelith Corp.
COMPULSORY NON-CREDIT COURSES
(Compulsory for Master’s programme in all disciplines; Optional for Ph.D. scholars)

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**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**


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**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-
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

PGS 504 BASICCONCEPTSINLABORATORYTECHNIQUES 0+1

Objective
To acquaint the students about the basics of commonly used techniques in laboratory.

Practical
Safety measures while in Lab; Handling of chemical substances; Use of burettes, pipettes, measuring cylinders, flasks, separatory funnel, condensers, micropipettes and vaccupets; washing, drying and sterilization of glassware; Drying of solvents/chemicals. Weighing and preparation of solutions of different strengths and their dilution; Handling techniques of solutions; Preparation of different agro-chemical doses in field and pot applications; Preparation of solutions of acids; 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
  Chemical Publ. Co.

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

Objective
To enlighten the students about the organization and functioning of agricultural research systems at national and international levels, research ethics, and rural development programmes and policies of Government.

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
Punia MS. Manual on International Research and Research Ethics. CCS, Haryana Agricultural University, Hisar.
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