DA-IICT  
M.Sc. (ICT in Agriculture and Rural Development)  

Course Abstract  
Semester - I  

Agricultural Information System (3-0-2-4):  
Objective  
The course aims to educate the students about the use and interrelationship of various information systems like crop production, market information, food processing, and weather forecasting.  
Components  
The course looks at the principles of analysis, design and implementation to develop agricultural information systems. Concepts and notations of Unified Modeling Language (UML) are used to construct models. The topics include: types of information systems, data collection and recording methods, visual modeling and UML, identification of actors, use cases, activity diagram, identification of classes, relationships, behaviour and structure, inheritance, analyzing object behaviour, designing the system architecture, domain specific model to enable rapid implementation of new, industry-specific applications over diverse platforms, agricultural information systems: current situation and perspectives in India, development of ontology, and multi-lingual framework.  
Outcome  
The student is expected to develop modules of such systems while undertaking project work in real world situations.  

Computer and Communication skills (1-1-4-4):  
Objective  
Improvement of Computer skills and Communication Skills  
Components  
The course introduces basic computer skills required to operate a computer, use of software packages, operating systems, networks, internet, and handling of devices. Topics include: principles and fundamentals of computers, networks, and peripherals as tools to: understand the applications and limitations of computer technology, search processes and data retrieval using search engines, downloading, uploading, Networking (Hardware, Software, Connectivity, LAN, WAN, Internet), troubleshooting (Hardware, OS, Security), development of simple web sites using HTML, XML, and tools.  
The course introduces basic communication skills to write, prepare, and comprehend articles and documents, interpersonal communication skills, and presentation skills.  
Outcomes  
- Students will learn methods of communicating and interacting in small groups and classroom situations.  
- Students will learn to listen/communicate with people so as to understand their problems and get their feedback  
- Students will learn to interview people to acquire and validate information
• Students will learn methods, tools, and techniques to improve their communication skills in a professional setting.

**Problem Solving Methodologies (3-0-4-5):**

**Objective**
To introduce basic problem solving methodologies and apply them to agricultural problems. This course intends to provide the students with an opportunity to learn systematic problem solving skills, to develop and appreciate good programming skills.

**Components**
Basic programming elements will be introduced to help the student to develop proficiency in writing and debugging correct and efficient programs using a programming language. Topics covered are: logical thinking and problem solving techniques, pseudo-code, algorithm, flow charts, decision trees, decision tables, structured English, data analysis, Polya’s How to solve it; statistical models, cause and effect diagrams, prioritization, linear programming models,

**Outcome**
The students would be well versed into the issues of programming languages and thinking processes.

**ICT-enabled Rural Services (3-0-2-4):**

**Objective**
The course aims to introduce various ICT enabled rural services related to land, education, health, insurance, micro-credit etc.

**Components**
Existing delivery models and issues and to conceptualize platform(s) for ICT enabled delivery systems, Issues in connectivity. Business modules and their successes, Case studies, designs of delivery systems.

**Outcome**
Students will learn how to design and implement ICT-enabled rural services by integrating information collected and make services available through a single point of access.

**Rural Finance (3-0-0-3):**

**Objective**
The course introduces principles of rural finance, structure of rural Finance in Indian Context and instruments of Rural Finance.

**Components**
Issues in Finance, Projections techniques, Institutions of Credit, Terms of Credit, Macro economic context of Rural Finance, Commodity Exchanges, Money supplies, and Computation techniques related to credit

**Outcome**
Students would be expected to understand the functioning of Rural Financial Institutions and be able to make projections of pricing, interest rates and credit requirements in micro to macro framework of the rural economy.

**Developmental Perspectives (3-0-0-3):**

**Objective**
The course introduces historical perspectives on development, the modern paradigm of development and evolution of developmental paradigm in Indian context. The course discusses issues and concerns regarding development paradigm especially with regard to Indian Agriculture and related rural areas in Indian context
Components
Planning process, Green Revolution, the Agreement on Agriculture, Global Agriculture context with specific reference to China and United States, The impasse in Agriculture today, the agrarian crisis, the way out, the future of Indian Agriculture

Outcome
The student is expected to understand the present developmental context within which the Indian Agriculture is located in terms of policies and prescriptions. The student is also expected to get introduced to the global trends in the agriculture in terms of sectors that are opening up. The students are also expected to understand the process of planning in the realm of rural development and the way it is headed. They can then carve out a niche in terms of ICT interface.

Semester – II

Fundamentals of Management and Agribusiness (3-0-0-3):
Objective
To introduce fundamentals and concepts of management and agribusiness. The course aims to help students to understand these concepts and apply them in professional roles.
Components
Management concepts, marketing management, financial management, organizational behaviour, information systems and technology management, human resource management, phasing of projects and tasks, CPM and PERT charts, evaluating past performance, future planning, agri-inputs marketing, agri-export marketing, procurement management, supply chain management, commodity exchanges and trading, quantitative aids for agri-business, food retailing, micro-finance, rural credit and agri-finance, etc.
Outcome
The students are expected to gain an insight into the entire range of issues in management principles.

Systems, Policies and Implications (3-0-0-3):
Objective
To introduce fundamentals and principles of agricultural economics and study of interactions between agricultural policy and development at the global level.
Components
Globalization and Global Economics, WTO agreements, International trade in Agriculture Sector, the International macro resource management: IMF, and World Bank, and effects of policy changes on agro-economy, case studies, and emerging trends.
Outcome
The students should be able to understand the macro developmental issues in agriculture in the global context as now the Indian Agriculture is linked to those processes.

Remote sensing and GIS in Land and Water Management (3-0-2-4):
Objective
To introduce the fundamentals and basic concepts of remote sensing, satellite imaging and geographic information systems and apply them to solve agricultural problems.
Components

**Outcome**
The students to gain knowledge in GIS applications and relationships with land and water management systems.

**Systems Approaches to Sustainable Development (3-0-0-3):**

**Objective**
To introduce the students to modeling, design development, games theory, and interlinkages with sustainable development

**Components**
Introduction to systems, components, component linkages, understand communication among system components, learn to model and map systems, learn to model and map information flows in the system, modeling information and information architecture:

**Outcome**
The students can identify, categorize, organize, and design information and connections between them, the games theory, defining sustainable development, role of ICT in sustainable development,

**Elective – I (3-0-2-4)**

**Elective – II (3-0-2-4)**

**Summer Internship (0-0-40-8)**

**Semester – III**

**Governance and Non-Farm Information Systems (3-0-2-4):**

**Objective**
To introduce the students to the Non Farm sector in rural context

**Components**
The topics covered are: Principles of e-governance, the non farm sector: an introduction, the non farm sector: labour, credit and production, the non farm sector: emerging trends, SHGs, Health delivery systems, rural industrial potentials

**Outcome**
The students should be in a position to understand the non-farm sector and apply the ICT interface to it.

**Information Delivery Systems and Models (3-0-2-4):**

**Objective**
Students will learn methods and techniques related to the lifecycle of information and data from collection, storage, retrieval, analysis, report generation, publication to develop effective delivery systems and models.

**Components**
- Information and Data Collection techniques:
- Socio-economic data
- Land and soil data
• Map scanning and other GIS data
• Satellite data
• Climate data:
• DA-IICT weather stations,
• Cloud cover data for weather prediction:
• Qualitative and quantitative mapping of observed facts and their verification
• Storage and retrieval techniques for the above kinds of Information and data
• Formulating requirements
• Design Relational Model to representation the data
• Normalize the Model to implement using database tables
• Review model and normalized tables against requirements
• Learn to apply standard and pre-packaged analysis (e.g., statistical, aggregation) techniques to above kinds of Information and data, interpret the results of these analyses, and generate useful reports, including GIS reports
• Learn to publish Information and data and reports on the web, web portals, Radio, TV, or presentations
• Publishing
• Considering needs of the multi-dimensional “audience”
• Getting and using feedback
• Responding to feedback

Resource Mapping and Micro Planning (3-0-2-4):

Objective
To apply the GIS in the context of rural resource mapping in order to initiate a better planning process

Components
The topics covered are: The PRA Technique, The GIS Applications in micro resource mapping, principles in micro planning, modeling in resource mapping

Outcome
The students may be able to initiate the process of resource mapping and planning at macro and micro levels in any of the fields like finance, credit, supply chain management and human resources.

Research Methodology (3-0-2-4):

Objective
To introduce the students to qualitative and quantitative issues in research as well as into philosophy of research.

Components
Hypotheses and questions formation, qualitative and quantitative techniques, positivism, modernism and postmodernism, Foucault, Gramsci and Ricoueur

Outcome
The students may gain some insight on conducting a research project.
Elective – III (3-0-2-4)

Elective – IV (3-0-2-4)

Semester – IV (0-0-40-16):

Thesis based on Industry/Research Internship 0-0-40-16

Elective courses

A set of elective courses is also offered for students to gain expertise in specialized areas. Some of these could be:

**Agri-business and Finance**

**Micro Credit and Rural Financial Services**

**Supply-chain Management**

**Rural Resource Management**

**Sustainable Development**

**Automation in Agriculture (3-0-2-4):**

Students will study the fundamentals of instrumentation and control and learn how to apply them to control agricultural systems, better management of commercial farms, greenhouses, and application to conservation and utilization of scarce resources.

- To introduce the basics of instrumentation, control and automation;
- To expose students to practical tasks of developing automation
- Instrumentation in operations and management of farms, Greenhouses; and Agribusiness.

**Content Development and Management (3-0-2-4)**

Students will learn how to produce educational material using digital media.

- Using multimedia design tools
- Story-boarding educational/extension/instruction materials
- Generating educational/extension/instruction materials:
  - Structured as Learning objects (e.g., in A-tutor, PLONE)
  - Storyboard might be the starting structure; stories play an important role in communication; keep them and their structure explicit
- Reusable and easily transformable
- Targeted to trainers, extension agents, teachers who will customize the material into a presentation, training, or a course
- Usability testing and validity of generation materials
- View this as an extension of Communications in a formal setting
- Digitize a village: collect information about a village so that it can be used for providing an extension service in Semester III. This information will also give us a basis for research work.

**Nanotechnology in Agriculture (3-0-2-4):**