Scheme of Teaching

&

Detailed Syllabus

For

Bachelor of Technology
Agriculture Technology

M. Tech. (Agriculture Technology)

(Two Year Program)

(w.e.f. Academic Session 2021-22)

School of Engineering & Technology
Shobhit Institute of Engineering & Technology

(Deemed to-be University)

NH-58, Modipuram, Meerut (U.P.) – 250110

Website: www.shobhituniversity.ac.in

Registrar
Shobhit Institute of Engg. & Tech.
(Deemed to-Be University)
NH-58, Modipuram, Meerut-250110

Program Name: M. Tech. (AT)

Category	Courses	L	T	P	Credits
Core (AI)	6	18	6	0	24
Open Engineering Elective Courses	6	18	6	0	24
Laboratory Courses (Skills)/Internship / Project	7	0	3	43	26
Total	19	36	15	43	74

School of Biological Engineering & Life Sciences
Department of Agriculture Technology & Agri. Informatics

Subject Code	Subject Name	L	T	P	Cr
1st Semester					
AIMT-501	Introduction to Information Technology	3	1	0	4
AIMT -503	Programming & Programming Paradigms	3	1	0	4
AIMT -505	Application of computer and technology in Rural Development information	3	1	0	4
AIMT -507	Agricultural Economics and Trade	3	1	0	4
AIMT -551	Object Oriented Programming Lab	0	0	4	2
AIMT -581	Seminar	0	3	0	2
2nd Semester					
AIMT -502	Database Technology and Applications	3	1	0	4
AIMT -504	Information resources, Information Retrieval andTechnical Communication	3	1	0	4
AIMT-506	Software Engineering and Quality Management	3	1	0	4
AIMT -521	Decision Support System/	3	1	0	4
AIMT-522	Knowledge Management/				
AIMT-523	Value-added Services and digital network including wireless and sensor networks/				
AIMT-524	Agriculture Bioinformatics				
AIMT -552	Operating System Lab	0	0	4	2
AIMT -582	Seminar	0	3	0	2
3rd Semester					
AIMT -601	Data Communication and Computer Networks, Information Security, Network Economy	3	1	0	4
AIMT -603	Farm Health Management, Expert Systems and Organic Agriculture	3	1	0	4

AIMT -605	e-Governance, Cloud Computing, Standards, Interoperability and Digital preservation	3	1	0	4
AIMT -621	Agricultural Credit and Financial Inclusion	3	1	0	4
AIMT -622	Geo-Informatics				
AIMT -623	Climate Change and its impact on agricultural production/				
AIMT -624	Strategic Research and Extension Plan (SREP) for Agricultural development				
AIMT-671	Minor Project	0 - 0 - 4			2
AIMT-681	Seminar	0 - 3 - 0			2

4th Semester

AIMT-692	Dissertation	0 - 0 - 28	14

M. Tech. Agriculture Technology

Programme Outcomes (POs):

PO: 1 Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization for the solution of complex engineering problem.

PO: 2 Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO: 3 Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.

PO: 4 Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO: 5 Modern tool usages: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling to complex engineering activities, with an understanding of the limitations.

PO: 6 The engineer and society: Apply reasoning informed by the contextual knowledge to assess Societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO: 7 Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO: 8 Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice

PO: 9 Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO: 10 Communication: Communicate effectively on complex engineering activities with the engineering community and with the society at large, such as, being able to comprehend and

write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO: 11 Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO: 12 Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES PSO/PEO:

The Department of Agriculture technology & Agri informatics, Shobhit Institute of Engineering and Technology, Meerut, offers Two Year (comprising 4 semesters) Undergraduate Programme in Agriculture Technology with objective of empowering students to acquire all-inclusive understanding of Agriculture Technology as an academic discipline. Upon completion of M. Tech. Agriculture Technology Degree Programme successfully, the students shall acquire the following skills and competencies.

The objectives of this course are as follows;

PSO: 1 To teach student about the fundamentals of Agriculture and their application with IT like use of sensors for weather forecasting..

PSO: 2 To educate student in designing and creating apps used in agriculture for farm advises, market price and postharvest management.

PSO: 3 To develop skills which covers the diverse areas of IT application like drones for crop protection, water and nutrient management.

PSO: 4 To teach student about the use of information technology for Precision agriculture.

Course Code	AIMT-501				
Category	CORE				
Course title	Introduction to Information Technology				
Scheme and Credits	**Credit**	**L**	**T**	P	
	4	3	1	0	
Objectives	This course will help students to develop basic understanding of the information technology and its uses, learn different information ecosystems, coding fundamentals and use of information technology in professional and institutional areas.				
Outcomes	After studying this course, the student will be able to: CO 1: Understand the basic concepts of information technology, its history and approaches. CO 2: Learn different tools of information technology such as computers, operating systems etc. CO 3: Explain different information ecosystems and specialized application software. CO 4: Illustrate coding fundamentals and different coding languages. CO 5: Apply the concepts of information technology in real life.				

Unit	**Content**	**Hours**
Unit I	Introduction to Information Technology; History and development of computing and digital approaches to information and communication	06
Unit II	Information technology landscape including computers, networks, operating systems, software, and programming	06
Unit III	Information ecosystems such as the Web, gaming, and social communication communities; General purpose productivity applications (advanced spreadsheets and word processing), specialized application software (image, video and sound processing), and enterprise information systems (OPAC, ILS)	08
Unit IV	Coding fundamentals including HTML, CSS and JavaScript; information technology and the individual; information technology and society	04
Unit-V	Use of information technologies by, and impact on, information professions and institutions such as libraries, archives and museums	04

Course Code	**AIMT -503**				
Category	CORE				
Course title	Programming & Programming Paradigms				
Scheme and Credits	**Credit**	**L**	**T**	P	
	4	3	1	0	
Objectives	This course will help students to develop basic understanding of the programming languages, its type and basic concepts of object orientation.				

Outcomes	After studying this course, the student will be able to: CO 1: Distinguish between different programming paradigms. CO 2: Choose an adequate programming paradigm in solving specific software engineering problems. CO 3: Apply at least one language from imperative, object-oriented and declarative paradigm. CO 4: Classify programming languages according to the paradigms they belong to. CO 5: Recognize the concepts of same kind from different programming languages and paradigms. CO 6: Employ adequate naming and code organization conventions.

Unit	**Content**	**Hours**
Unit I	Nature of programmingnon-imperative languages languages: Imperative languages	06
Unit II	Scripting languages, Data-oriented languages, Object-oriented languages etc.	06
Unit III	Programming environments: Compilers and Interpreters, Interactive development tools, Run-time support environments, Debugging Tools, Testing Tools	06
Unit IV	Object Orientation: Basic concepts- objects, classes, methods, overloading methods, messages inheritance; Functional programming; Logic Programming	06

Course Code	**AIMT -505**				
Category	CORE				
Course title	Application of computer and information technology in rural development				
Scheme and Credits	**Credit**	**L**	**T**	P	
	4	3	1	0	
Objectives	This course will help the students to understand the basic concepts of computer and information technology and its applications in rural development.				
Outcomes	After learning this course, students will be able to: CO 1: Explain the importance of computer and information technology in citizen service delivery CO 2: Discuss the role of computer and information technology in rural development CO 3: Highlight applications of computer and information technology in agriculture development. CO 4: Describe the role of computer and information technology and GIS in creating livelihood opportunities in rural communities.				

Unit	**Content**	**Hours**
Unit I	Elementary knowledge about computer hardware; Different types of software, operating system, (Microsoft Office, DOS, MS DOS, and WINDOWS); Knowledge about DTP, data entry, spreadsheet.	06

Unit II	Data analysis using appropriate Software – selecting graph type, saving and printing of graphs, Use of statistical and mathematical formulas.	06
Unit III	Operating SPSS; Generation of Resource data' Sources acquisition, structure, transformation into map/diagram/visual presentation for better comprehension.	06
Unit IV	Cartographic products; diagrams, maps, charts, types of maps-components – Techniques of Cartography; Isopleths, choropleth, chorochromatic, Choroschematic etc.- use of maps	06
Unit-V	Introduction of GIS, its components – spatial data organisation and management – use of GIS software.	05

Course Code	AIMT -507				
Category	CORE				
Course title	Agricultural Economics and Trade				
Scheme and Credits	**Credit**	**L**	**T**	P	
	4	3	1	0	
Objectives	This course will help students to contribute to better decision making by farmers, or by agencies servicing agriculture, understand why farmers respond to policies and economic opportunities in the ways they do and to acquaint the learner with introductory Agricultural Economics, development of agriculture in India, use of yield increasing inputs, marketing, trade and prices.				
Outcomes	After completion of this course, CO 1: The students will be learn to improve decision making about things like agricultural production methods, agricultural input levels and resource conservation etc. CO 2: Students should be able to communicate effectively, economic concepts, decision-making, and agricultural and trade concepts. CO 3: Students should have the skills to fit into a business, agency, or academic environment and use economic concepts to quantify and analyse issues related to their employer's issues.				

Unit	**Content**	**Hours**
Unit I	**Nature, scope and significance of agricultural production economics-concept of production in economic sense. Factors of production-classification, interdependence and factor substitution.** Role and Importance of Agriculture in National Economy: share in National income, Source of livelihood, Employment.	05
Unit II	Industrial development and trade; National Resource base of Indian agriculture, India's position in World Agriculture, Comparison of India with other countries.	05
Unit III	Agricultural Growth in India during pre and post-independence period; Factors responsible for agricultural development in India, Growth in use of technological factors in production such as irrigation, seed, fertilizers etc.;	05

Unit IV	Farm capital structure in Agriculture and its changes, Issues on Capital formation in Indian agriculture, Credit in Indian agriculture, Factors determining demand for credit.	05
Unit-V	Theories of international trade: Domestic trade, free trade, international trade, GATT, WTO, implications of AOA, market access, domestic support, export subsidies, EXIM-policy and ministerial conferences. Cooperative marketing.	06

Course Code	**AIMT -502**				
Category	CORE				
Course title	Database technology and applications				
Scheme and Credits	**Credit**	**L**	**T**	P	
	4	3	1	0	
Objectives	At the end of this class, the successful student will have a broad understanding of database concepts and database management system software, have a high-level understanding of major DBMS components and their function, be able to model an application's data requirements using conceptual modeling tools and design database schemas based on the conceptual model, be able to write SQL commands to create tables and indexes, insert/update/delete data, and query data in a relational DBMS.				
Outcomes	After completion of this course, the students will be able to CO 1: Explain the characteristics, architecture of database approach, describe the components, major functions of a database system and give examples of their use. CO 2: Compare and contrast appropriate data models, including concepts in modeling notation and how they would be used. CO 3: Create a relational database schema in SQL, use SQL to create a Non-procedural query, write a stored procedure that deals with parameters and hassome control flow, to provide a given functionality. CO 4: Familiarize with the related areas in databases and gaining familiarity with other popular databases used in the industry.				

Unit	**Content**	**Hours**
Unit I	Active, Deductive, Logic and Knowledge Databases	04
Unit II	Data Reverse Engineering (DRE), Data Warehousing & Data Mining, Database interoperability and integration	06
Unit III	Database Languages SQL XML, Database reverse engineering (DBRE), Database Services, Design Methodologies and Semantic enrichment, Distributed DBMSs, Emerging Developments, Geospatial and Temporal Databases	08
Unit IV	Internet and Web-Based Database Systems, Multimedia (Audio, Video, Image, Music) Database Systems, Relational, Object-Oriented and Object-Relational Database Systems	04

Course Code	**AIMT -504**				
Category	CORE				
Course title	Information resources, information retrieval and technical communication				
Scheme and Credits	**Credit**	**L**	**T**	P	
	4	3	1	0	
Objectives	This course will help students to understand the basic elements of Information technology, the impact of technologies in their lives and workplaces, how to use and apply a variety of information and communication technologies to problem solving, decision making, inquiring and researching in the context of other subject matter				
Outcomes	After completion of this course, CO 1: Students will access, use and communicate information from a variety of technologies. CO 2: Students will seek alternative viewpoints, using information technologies. CO 3: Students will critically assess information accessed through the use of a variety of technologies. CO 4: Students will use organizational processes and tools to manage inquiry and technology to aid collaboration during inquiry. CO 5: Students will use technology to investigate and/or solve problems. Students will use electronic research techniques to construct personal knowledge and meaning.				

Unit	**Content**	**Hours**
Unit I	Structures, functions, products, and services of different categories of information systems such as, libraries, documentation centres, clearing houses, referral centres, information analysis centres, databank etc.	
Unit II	National, regional, global information systems, services and programmes; overall objectives, basic factors to be considered in system design,	
Unit III	Characteristic features, illustrative examples, with emphasis on computerized systems and services and the methodology of handling the respective data bases.	
Unit IV	Information Retrieval Process, the Process of Searching, Common Command Languages and Multiple Database Searching etc.	

Course Code	**AIMT -506**				
Category	CORE				
Course title	Software engineering and quality management				
Scheme and Credits	**Credit**	**L**	**T**	P	
	4	3	1	0	

Objectives	This course will help students to understand the core principles consistent in software construction and maintenance: fundamental software processes and life-cycles, mathematical foundations of software engineering, requirements analysis, software engineering methodologies and standard notations, principles of software architecture and re-use, software quality frameworks and validation, software development, and maintenance of environments and tools.
Outcomes	After completion of this course, the students will be able to: CO 1: Gain knowledge of basic Software engineering methods and practices, and their appropriate application. CO 2: Describe software engineering layered technology and Process frame work. CO 3: Understanding of software requirements, data models, object models, context models and behavioural models and different software architectural styles. CO 4: Understanding of implementation issues such as modularity and coding standards, software testing approaches. CO 5: Describe software measurement and software risks, of software evolution and related issues such as version management. CO 6: Understanding on quality control and how to ensure good quality software.

Unit	**Content**	**Hours**
Unit I	Software Quality assurance, Software Metrics, Software Validation, Static and dynamic Analysis, Symbolic Equation. Mutation Analysis, Dynamic Testing, unit Testing, Whitebox and black box testing, Test Case Generation, Integration Testing.	06
Unit II	Bottom-up & Topdown Testing. System Testing, Function Testing, Performance Testing, Acceptance Testing, Installation Testing, theoretical foundation of Testing, Formal verification, Test Tools.	04
Unit III	Software Reliability; Software Complexity. Issues in Project Management - Management Functions, Software Project Management Plan, Software management Structures, Personnel Productivity.	05
Unit IV	Software project scheduling and the establishment of relationships among the different tasks. Tasks, dependencies and conflict resolution. Resource management and allocation.	04
Unit-V	Risk assessment and its impact in the planning and scheduling of software projects.	02

Course Code	**AIMT -601**				
Category	CORE				
Course title	Data communication and computer networks, information security, network economy				
Scheme and Credits	**Credit**	**L**	**T**	P	
	4	3	1	0	
Objectives	The main emphasis of this course is on the organization and management of computer networks and information security. The course objectives include learning about computer network organization and implementation, obtaining a theoretical understanding of data communication and computer networks, and gaining practical experience in installation, monitoring, and troubleshooting of current networking systems.				

Outcomes	After the course completion, students will be able to: CO1: Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies. CO2: Have a basic knowledge of the use of cryptography and network security. CO3: Specify and identify deficiencies in existing protocols, and then go onto formulate new and better protocols. CO4: Analyze, specify and design the topological and routing strategies for an IP based networking infrastructure. CO5: Have a working knowledge of datagram and internet socket programming.

Unit	**Content**	**Hours**
Unit I	Introduction, Fundamentals of information transmission and coding	04
Unit II	Direct link communication I: wired media, Direct link communication II: wireless media, End-to-end communication: packet switching and circuit switching.	06
Unit III	Socket programming and network communication, Internet working with TCP/IP: structure, Internet working with TCP/IP: functionality, Congestion control, Routing	06
Unit IV	Internet traffic: data and multimedia payloads, Multimedia communication and QoS, Transparent network services: DNS, HTTP, web server design, caching and CDNs, Network security: "CIA," denial-of-service attack, worm attack.	06

Course Code	**AIMT -603**				
Category	CORE				
Course title	Farm health management, expert systems and organic agriculture				
Scheme and Credits	**Credit**	**L**	**T**	P	
	4	3	1	0	
Objectives	This course aims at critical understanding of the different techniques of farm management, Understand limited resources available in the economy, realize the need to exploit and utilize through development and improvement of production techniques. Make students aware of the availability of rich natural endowments to achieve sustainable agricultural development with this knowledge they can challenge the problems of unemployment inequality, shortage of food productions, poverty and be useful to compete advanced agricultural economies.				

Outcomes	After completion of this course: CO 1: The student will be able to explain the major aspects of agricultural practices and traditions through time and throughout the world. CO 2: The student will be able to explain in general the relationships among culture, economics, politics, science, and agricultural development. CO 3: A solid understanding of the cross-cultural interactions and exchange that linked the world's people and facilitated agricultural development is also expected. CO 4: The student will study and analyze the refereed-journal articles, texts, and practices that represent the perspectives of different societies and agricultural traditions. CO 5: To show how agricultural scientists are attempting to minimize agricultural pollution and sustain food production adequate for the world's population.

Unit	**Content**	**Hours**
Unit I	Farm Management: Definition, scope, functions of farm management science, nature and characteristics of farm management science	06
Unit II	Various farm management decisions, farm planning and budgeting partial and complete budget, steps in farm planning and budgeting, types and system of farming.	06
Unit III	Linear programming: assumptions, advantages and limitations of linear programming. Farm business income, family labour income, net income using farm management data, preparation of farm plans.	06
Unit IV	Overview of Organic Agriculture Principles and Philosophy OF Cultural Practices and Biological Processes, Organic Crop Production and Marketing	06
Unit-V	Pest Management for Organic Producers, Organic Livestock Production and Marketing, Future Trends in Organic Agriculture	06

Course Code	**AIMT -605**				
Category	CORE				
Course title	**e**-governance, cloud computing, standards, interoperability and digital preservation				
Scheme and Credits	**Credit**	**L**	**T**	P	
	4	3	1	0	
Objectives	The main objective of cloud computing, accessing resources and services needed to perform functions with dynamically changing needs, to understand the cloud privacy and security concepts to create secure cloud environment and to learn the various cloud platforms to implement real time cloud applications				
Outcomes	On successful completion of this course, students will be able to: CO 1: Analyze and explain the concepts of cloud computing. CO 2: Demonstrate the types and services in cloud computing. CO 3: Describe the Email Communications and Collaborating on Group Projects and Events. CO 4: Illustrate and Simulate Schedules and Task Management. CO 5: Develop Web-Based Communication Tools.				

Unit	Content	Hours
Unit I	System models for advanced computing, cooperative, grid and cloud computing.	
Unit II	Software systems, Features in Saas, Paas and Iaas. Service oriented architecture and web services, Features and architectures.	
Unit III	Virtualization, Characteristic features, Taxonomy Hypervisor, Virtualization and Cloud Computing, Pros and Cons.	
Unit IV	Environment, Map Reduce Hadoop Library from Apache, Open Source Cloud Software Systems.	
Unit-V	Grid Architecture, Service Modeling, resource management and Application trends.	

Course Code	AIMT -521				
Category	CORE				
Course title	Decision Support System				
Scheme and Credits	**Credit**	**L**	**T**	P	
	4	3	1	0	
Objectives	Decision support systems and expert systems and their implementations are examined in this course. This course discusses the manager's responsibilities for problem solving and decision making and about those areas in which computers can be used as tools to gain the insight needed to support selection of decision alternatives.				
Outcomes	After completion of this course, students will be able to: CO 1: Distinguish among data processing systems, management information systems, and decision support/expert systems. CO 2: Integrate the major components of decision support systems (DSS) and expert systems (ES). CO 3: Capture decision rules based on knowledge provided by an acknowledged expert and codify those rules as assertions, rules, and ad hoc procedures. CO 4: Analyze how information is used to solve problems. CO 5: Utilize commercial spreadsheet and database integrated packages to develop "what if" simulation models to support the decision- making process.				

Unit	Content	Hours
Unit I	Introduction to – Concepts of Data, Information, Information Systems & End Users. Systems Concepts: Open System, Closed System; Information Systems and Systems Concept.	06
Unit II	Building Information System: System Analysis and Design – Systems Development Cycle (Identification of Requirements, Feasibility Study, System Analysis, Design And Implementation), Prototyping, Evolution of Information Systems: TPS, OAS, MIS, DSS, EIS, ES	06

Unit III	Decision Making: Introduction and Definitions, Simons Decision Making Model, How Decisions are Supported, DSS Configurations, DSS Characteristics and Capabilities, Components of DSS, DSS Classifications	06
Unit IV	DSS Modeling-Static and Dynamic Models, Certainty, Uncertainty, and Risk, Sensitivity Analysis, What-IF, and Goal Seeking, Making Decisions in Groups: Group Decision Support System(GDSS),Characteristics, Process, Benefits, and Dysfunctions, Supporting Group work with Computerized Systems, Tools for Indirect and Indirect Support of Decision Making, From GDSS to GSS.	06

Course Code	AIMT -522				
Category	CORE				
Course title	Knowledge Management				
Scheme and Credits	**Credit**	**L**	**T**	P	
	4	3	1	0	
Objectives	Knowledge Management (KM) as an emerging discipline deals with concept of how organisations, groups, and individuals handle their knowledge in all forms, in order to improve organisational performance. This course examines the organisation of knowledge, the selection and use of suitable knowledge representation methods or tools, the access to stored knowledge through search and retrieval techniques.				
Outcomes	After completion of this course, students will be able to: CO 1: Use a framework and a clear language for knowledge management concepts CO 2: Describe how valuable individual, group and organizational knowledge is managed throughout the knowledge management cycle CO 3: Define the different knowledge types and explain how they are addressed by knowledge management CO 4: Describe the major roles and responsibilities in knowledge management implementations CO 5: Identify some of the key tools and techniques used in knowledge management applications CO 6: Identify and evaluate major KM issues such as ethics, knowledge ownership vs. authorship, copyright, intellectual property and knowledge sharing incentives.				

Unit	**Content**	**Hours**
Unit I	Knowledge Management System: Definition and types of Knowledge, Frame work for Knowledge Management	04
Unit II	Knowledge Representation Techniques: Rules, Frames, Semantic Networks	04
Unit III	Introduction to Business Intelligence: Origins and Drivers of Business Intelligence,	04

Unit IV	General Process of Intelligence Creation and Use, Characteristics of Business Intelligence, Towards Competitive Intelligence, Successful BI Implementation, Structure and Components of BI, Future trends.	06

Course Code	AIMT -521				
Category	CORE				
Course title	Value-added services and digital network including wireless and sensor networks				
Scheme and Credits	**Credit**	**L**	**T**	P	
	4	3	1	0	
Objectives	This course will help students to understand the basic components of digital networking, to learn about theoretical bounds on the rates of digital communication system and represent a digital signal using several modulation methods and draw signal space diagrams, compute spectra of modulated signals and apply redundancy for reliable communication.				
Outcomes	After completion of this course, the students will be able to: CO 1. Understand the basics of information theory and coding techniques. CO 2. Determine the minimum number of bits per symbol required to represent the source and the maximum rate at which a reliable Communication can take place over the channel. CO 3. Describe and determine the performance of different waveform techniques for the generation of digital representation of signals. CO 4. Determine methods to mitigate inter symbol interference in baseband transmission system. CO 5. Describe and determine the performance of different error control coding schemes for the reliable transmission of digital representation of signals and information over the channel. CO 6. Understand various spreading techniques and determine bit error performance of various digital communication systems.				

Unit	**Content**	**Hours**
Unit I	Architecture, Mobility management, Networks signalling in following: Personal Communication Services (PCS); Global system for Mobile Communication (GSM) system; General Packet Radio Services (GPRS)	04
Unit II	Mobile Data Communication: WLANs (Wireless LANs) IEEE 802.11 standard, Mobile IP; Wireless Application Protocol (WAP): The Mobile Internet standard, WAP Gateway and Protocols, Wireless Mark-up Languages (WML)	04
Unit III	Third Generation (3G) Mobile Services: Introduction to International Mobile Telecommunications 2000 (IMT 2000) vision, Wideband Code Division Multiple Access (W-CDMA), and CDMA 2000, Quality of services in 3G	04

Unit IV	Wireless local Loop (WLL); Global Mobile Satellite Systems; Basic Sensor Network Architectural Elements, Applications of Sensor Networks, Comparison with Ad Hoc Wireless Networks, Challenges and Hurdles.	04
Unit-V	Architecture of WSNs Hardware components, Operating systems and execution environments, some examples of sensor nodes, Network Architecture, Sensor networks scenarios	04
Unit- VI	Communication Protocols: Physical Layer and Transceiver design considerations in WSNs, Fundamentals of (wireless) MAC protocol, Address and name management in wireless sensor networks, Localization and positioning, Routing protocols Data Dissemination and Gathering, Routing Strategies in Wireless Sensor Networks, QoS in wireless sensor networks, Coverage and deployment	04
References		

Course Code	AIMT -524				
Category	CORE				
Course title	Agricultural bioinformatics				
Scheme and Credits	**Credit**	**L**	**T**	P	
	4	3	1	0	
Objectives	Demonstrate **mastery of the core concepts of Bioinformatics**. These include advanced methods in computational biology, the chemical principles that underlie biochemistry, molecular biology and genomics, the design and implementation of relational databases, fundamental methods in probability and statistics, and the construction of predictive mathematical models of biological systems.				
Outcomes	CO 1: To get introduced to the basic concepts of Bioinformatics and its significance in Biological data analysis. CO 2: Describe the history, scope and importance of Bioinformatics and role of internet in Bioinformatics. CO 3: Explain about the methods to characterise and manage the different types of Biological data. CO 4: Classify different types of Biological Databases. CO 5: Introduction to the basics of sequence alignment and analysis. CO 6: Overview about biological macromolecular structures and structure prediction methods.				

Unit	**Content**	**Hours**
Unit I	Introduction to Bioinformatics; Introduction to Agro informatics, Indian and International Scenario, Intelligent Technology in Agro informatics, Organic Farming and Information Technology	04

Unit II	Agriculture Information Sources, Scientific Communications, Agriculture Literature, Journals, Technical Reports, Electronic Publishing, Flow of agriculture and Scientific information	04
Unit III	Agriculture Information System AGRIS/ CARIS/ AGROVOC/ARIS, Decision Support System(DSS) and its types; Database concepts and their types, Agricultural Databases and their importance	04
Unit IV	Functioning of Agricultural Databases, Plant Genome Databases, AGRICOLA, Plants National Databases (PPMdb, TAIR, GrainGene, BrassicaDB, MaizeDB, Soybase, TIGR etc)	04
Unit-V	Bioinformatics Applications-EMBL, Genbank, OMIM, DDBJ, Gene Cards, Sequence search and Retrieval, Sequence Identification (BLAST),Alignment, Sequence analysis/ submission/translation, Proteomic and Genomic Web resources	04
Unit- VI	AgriInformatics tools-Crop Nutrient Tool, Vegspec, NAT, Ecological Site Descriptor, other farm and risk management softwares.	04

Course Code	**AIMT -621**				
Category	CORE				
Course title	Agricultural Credit and Financial Inclusion				
Scheme and Credits	**Credit**	**L**	**T**	P	
	4	3	1	0	
Objectives	This course will help students to develop a critical understanding of agricultural credit market, the business environment in agriculture, financial analysis and elements of agribusiness.				
Outcomes	After completion of this course, students will be able to: CO 1: Understand the institutional and non-institutional sources of credit system and various banks related. CO 2: Basic components of business management in agriculture. CO 3: Analyse the factors associated with agricultural business.				

Unit	**Content**	**Hours**
Unit I	Agricultural credit market- institutional and non-institutional sources of credit cooperatives credit system, commercial banks and regional rural banks, NABARD and AFC, problems and issues in institutional agricultural credit system.	06
Unit II	Business management environment of agriculture business, tasks of a professional manager, management system and processes, types of management decisions, decision making techniques and processes, organizational culture and management ethics.	06
Unit III	Financial analysis of agricultural businesses; liquidity, capital structure, and growth of agricultural firms; risk and return; capital budgeting methods; analysis of land investments, leasing, and costs of credit.	06

Unit IV	Financial intermediation and major financial institutions for agriculture; credit scoring, loan pricing, and asset-liability management techniques by financial intermediaries; public policies affecting agricultural credit markets	06

Course Code	**AIMT -622**				
Category	CORE				
Course title	Geo Informatics				
Scheme and Credits	**Credit**	**L**	**T**	P	
	4	3	1	0	
Objectives	This course will help students to comprehend fundamental concepts and practices of Geographic Information Systems (GIS) and advances in Geospatial Information Science and Technology (GIS&T), apply basic graphic and data visualization concepts such as color theory, symbolization, and use of white space and demonstrate organizational skills in file and database management.				
Outcomes	After completion of this course, the student will be able to: CO 1: Give examples of interdisciplinary applications of Geospatial Information Science and Technology. CO 2: Apply GIS analysis to address geospatial problems and/or research questions. CO 3: Demonstrate proficiency in the use of GIS tools to create maps that are fit-for-purpose and effectively convey the information they are intended to. CO 4: Effectively communicate and present project results in oral, written, and graphic forms. CO 5: Demonstrate confidence in undertaking new (unfamiliar) analysis using GIS, troubleshoot problems in GIS, and seek help from software/website help menus and the GIS community to solve problems.				

Unit	**Content**	**Hours**
Unit I	Geoinformatics; Survey Camp; Geographical Information System	04
Unit II	Introduction to Remote Sensing, Machine Processing of Remotely Sensed Data;	04
Unit III	Instrumentation, Laboratory and Field Practices in Geoinformatics;	04
Unit IV	Global Navigation Satellite System; Laser Scanning and Photogrammerty; Geospatial Data Processing; Introduction to Geodesy	04

Course Code	**AIMT -623**				
Category	CORE				
Course title	Climate change and its impact on agricultural production				
Scheme and Credits	**Credit**	**L**	**T**	P	
	4	3	1	0	

Objectives	This course explores the topic of climate change and global warming. We will begin by exploring how the Earth's global mean surface temperature is determined through a global "balancing act" of the rate of energy that comes from the Sun and the rate at which the planet returns that energy into space. We will also discuss the natural greenhouse effect, and how this contributes to a balanced global climate.
Outcomes	After studying this course, student should be able to: CO 1: Understand the physical basis of the natural greenhouse effect, including the meaning of the term radiative forcing CO 2: Know something of the way various human activities are increasing emmissions of the natural greenhouse gases, and are also contributing to sulphate aerosols in the troposphere CO 3: Demonstrate an awareness of the difficulties involved in the detection of any unusual global warming 'signal' above the 'background noise' of natural variability in the Eath's climate and of attributing (in whole or in part) any such signal to human activity CO 4: Understand that although a growing scientific consensus has become established through the IPCC, the complexities and uncertainties of the science provide opportunity for climate sceptics to challenge the Panel's findings.

Unit	**Content**	**Hours**
Unit I	Climate and climate change, Global warming and climate change	04
Unit II	Observed climate change and international responses	04
Unit III	Effects of climate change, Tools and techniques for impacts assessment	04
Unit IV	Policy and legislation: national and international scenarios, Future climate scenarios	04
Unit V	Climate change adaptation, Climate change mitigation, Issues need attention, International Response and Individual Responsibility.	04

Course Code	**AIMT -624**				
Category	CORE				
Course title	**STRATEGIC RESEARCH AND EXTENSION PLAN (SREP) FOR AGRICULTURAL DEVELOPMENT**				
Scheme and Credits	**Credit**	**L**	**T**	P	
	4	3	1	0	
Objectives	This course will help students to understand the Concept, Objectives, Principles, Philosophy and Process of Extension Revitalization of Agricultural Extension System				

Outcomes	After completion of this course, the students will be able to: CO 1: To review the SREP methodology followed in the pilot districts with a focus on linkages and identification and prioritization of research, extension and development issues CO 2: To analyze the mechanism followed in each state for implementation of SREP outputs in operationalizing strategies evolved CO 3: To identify the gaps in SREP methodology and its implementation process and suggest appropriate measures to overcome the gaps, and CO 4: To evolve future directions for up-scaling and institutionalization of SREP approach.

Unit	**Content**	**Hours**
Unit I	Concept, Objectives, Principles, Philosophy and Process of Extension Revitalization of Agricultural Extension System	
Unit II	Strategic Research and Extension Plan (SREP), Farming System Approach (FSA), Farming Situation Based Extension (FSBE), Farmer's Organizations (FO and FIGs) — Federation at Different Levels	
Unit III	Role of KVKs in Agricultural Extension, Public Private Partnership (PPP)	
Unit IV	Gender Mainstreaming and Gender Sensitization, Farm Schools and FFS — Concept and their Operationalization.	

Course Code	**AIMT -581, AIMT- 582, AIMT- 681**				
Category	CORE				
Course title	**Seminar**				
Scheme and Credits	**Credit**	**L**	**T**	P	
	2	0	3	0	
Objectives	1. Students will demonstrate the ability to perform close and critical readings. 2. Students will demonstrate the ability to consider critically the motives and methods of scholarship and the relationship between them. 3. Students will demonstrate the ability to distinguish opinions and beliefs from researched claims and evidence and recognize that kinds of evidence will vary from subject to subject. For instance, some fields call for quantitative support while others work more commonly with quoted, textual evidence. 4. Students will demonstrate the ability to ask disciplinarily appropriate questions of the material and recognize when lines of inquiry fall outside of disciplinary boundaries. 5. Students will demonstrate the ability to evaluate, credit, and synthesize sources.				

M. Tech (Agriculture Technology)

COs Mapping with POs & PSOs

AIMT-501 INTRODUCTION TO INFORMATION TECHNOLOGY

Course Outcome:

CO1 : Understand the basic concepts of information technology, its history and approaches.

CO2: Learn different tools of information technology such as computers, operating systems etc.

CO3: Explain different information ecosystems and specialized application software.

CO4: Illustrate coding fundamentals and different coding languages.

CO5: Apply the concepts of information technology in real life.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO 1	1		1		2	1		1		1		1	1		1	2
CO 2		2		1							2			2		
CO 3			2			2			2				2			2
CO 4		3		3							2				2	
CO 5	2	2			1		3		3			1		3		2
CO 6			2	1				1		2			3		3	
Average	1.5	2.3	1.7	1.7	1.5	1.5	3.0	1.0	2.5	1.5	2.0	1.0	2.0	2.5	2.0	2.0

AIMT -503 PROGRAMMING & PROGRAMMING PARADIGMS

Course Outcome:

CO 1: Distinguish between different programming paradigms.

CO 2: Choose an adequate programming paradigm in solving specific software engineering problems.

CO 3: Apply at least one language from imperative, object-oriented and declarative paradigm.

CO 4: Classify programming languages according to the paradigms they belong to.

CO 5: Recognize the concepts of same kind from different programming languages and paradigms.

CO 6: Employ adequate naming and code organization conventions.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO 1	-				1			2		1		1		1	3	1
CO 2			1				3		-		3					
CO 3	2					1							1	2	2	2
CO 4		3	2					1	2	2		2		1		1
CO 5	1					1					2		2			
CO 6			3		3					1		3		2	1	1
Average	1.5	3.0	2.0		2.0	1.0	3.0	1.5	2.0	1.3	2.5	2.0	1.5	1.5	2.0	1.3

AIMT -505 APPLICATIONS OF COMPUTER AND INFORMATION TECHNOLOGY IN RURAL DEVELOPMENT

Course Outcome:

This course will help the students to understand the basic concepts of computer and information technology and its applications in rural development.

After learning this course, students will be able to:

CO 1: Explain the importance of computer and information technology in citizen service delivery

CO 2: Discuss the role of computer and information technology in rural development

CO 3: Highlight applications of computer and information technology in agriculture development.

CO 4: Describe the role of computer and information technology and GIS in creating livelihood opportunities in rural communities.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO 1	1		2		2			1	1	1		2	2	3	1	1
CO 2			1	2			3				3			2	2	2
CO 3	2				1	1		2	1	1	1	1	1			1
CO 4		3		1		1	2				2	2	1	1	2	1
Average	1.5	3.0	1.5	1.5	1.5	1.0	2.5	1.5	1.0	1.0	2.0	1.7	1.3	2.0	1.7	1.3

AIMT -507 AGRICULTURAL ECONOMICS AND TRADE

Course Outcome:

CO 1: The students will be learn to improve decision making about things like agricultural production methods, agricultural input levels and resource conservation etc.

CO 2: Students should be able to communicate effectively, economic concepts, decision-making, and agricultural and trade concepts.

CO 3: Students should have the skills to fit into a business, agency, or academic environment and use economic concepts to quantify and Analyse issues related to their employer's issues.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO 1	1	2	2	-	2	1		1	1	1	2	1	2	1	2	
CO 2		2	1	1	1		3		2		3	1	1	1		1
CO 3	1	1	3	1		1		2			1	2	1		3	2
Average	1.0	1.7	2.0	1.0	1.5	1.0	3.0	1.5	1.5	1.0	2.0	1.3	1.3	1.0	2.5	1.5

AIMT -502 DATABASE TECHNOLOGY AND APPLICATIONS

Course Outcome:

CO 1: Explain the characteristics, architecture of database approach, describe the components, major functions of a database system and give examples of their use.

CO 2: Compare and contrast appropriate data models, including concepts in modeling notation and how they would be used.

CO 3: Create a relational database schema in SQL, use SQL to create a non-procedural query, write a stored procedure that deals with parameters and has some control flow, to provide a given functionality.

CO 4: Familiarize with the related areas in databases and gaining familiarity with other popular databases used in the industry.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO 1	1	2		1	1	1		3	1	1	1	2		1	2	1
CO 2	1	1	1	1			3			2	3	1				1
CO 3	2				2	1	2	2	1	2	2		1	1	2	

CO 4		3		2					1	3					3	2
Average	1.3	2.0	1.0	1.3	1.5	1.0	2.5	2.5	1.0	2.0	2.0	1.5	1.0	1.0	2.3	1.3

AIMT -504 INFORMATION RESOURCES, INFORMATION RETRIEVAL AND TECHNICAL COMMUNICATION

Course Outcome:

CO 1: Students will access, use and communicate information from a variety of technologies.

CO 2: Students will seek alternative viewpoints, using information technologies.

CO 3: Students will critically assess information accessed through the use of a variety of technologies.

CO 4: Students will use organizational processes and tools to manage inquiry and technology to aid collaboration during inquiry.

CO 5: Students will use technology to investigate and/or solve problems. Students will use electronic research techniques to construct personal knowledge and meaning.

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**
CO 1	1							2		1			1	2	1	1
CO 2			1				3				3				1	
CO 3	2			1		1						2	1			2
CO 4		3												2		3
CO 5									1			3	2		3	
Average	1.5	3.0	1.0	1.0		1.0	3.0	2.0	1.0	1.0	3.0	2.5	1.3	2.0	1.7	2.0

AIMT -506 SOFTWARE ENGINEERING AND QUALITY MANAGEMENT

Course Outcome:

CO 1: Gain knowledge of basic Software engineering methods and practices, and their appropriate application.

CO 2: Describe software engineering layered technology and Process frame work.

CO 3: Understanding of software requirements, data models, object models, context models and behavioral models and different software architectural styles.

CO 4: Understanding of implementation issues such as modularity and coding standards, software testing approaches.

CO 5: Describe software measurement and software risks, of software evolution and related issues such as version management.

CO 6: Understanding on quality control and how to ensure good quality software.

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**
CO 1	2	1		1	1	1	1	1	1	1	1	1	2	2	2	1
CO 2		2	1				2		2	1	3			1		1
CO 3	1			2		1		2	3		2	2	1		2	1
CO 4		2	1		2	2	1	3	1			3	1	1	2	3
CO 5	1	1		3		3		1		1	2	2	2	3	2	3
CO 6			3		2		1			1		1		2	3	2
Average	1.3	1.5	1.7	2.0	1.7	1.8	1.3	1.8	1.8	1.0	2.0	1.8	1.5	1.8	2.2	1.8

AIMT -601 DATA COMMUNICATION AND COMPUTER NETWORKS, INFORMATION SECURITY, NETWORK ECONOMY

Course Outcome:

CO 1: Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies.
CO 2: Have a basic knowledge of the use of cryptography and network security.
CO 3: Specify and identify deficiencies in existing protocols, and then go onto formulate new and better protocols.
CO 4: Analyze, specify and design the topological and routing strategies for an IP based networking infrastructure.
CO 5: Have a working knowledge of datagram and internet socket programming.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO 1	1	1						1	1	1		2	2	2	1	2
CO 2			1	1			3		1		3				1	
CO 3	2	1			2	1		2		2		3	1	2	2	3
CO 4	2	3					2		2		1	1			3	2
CO 5			1			3		3				1	2	3	1	1
Average	1.7	1.7	1.0	1.0	2.0	2.0	2.5	2.0	1.3	1.5	2.0	1.8	1.7	2.3	1.6	2.0

AIMT -603 FARM HEALTH MANAGEMENT, EXPERT SYSTEMS AND ORGANIC AGRICULTURE

Course Outcome:

CO 1: The student will be able to explain the major aspects of agricultural practices and traditions through time and throughout the world.
CO 2: The student will be able to explain in general the relationships among culture, economics, politics, science, and agricultural development.
CO 3: A solid understanding of the cross-cultural interactions and exchange that linked the world's people and facilitated agricultural development is also expected.
CO 4: The student will study and analyze the refereed-journal articles, texts, and practices that represent the perspectives of different societies and agricultural traditions.
CO 5: To show how agricultural scientists are attempting to minimize agricultural pollution and sustain food production adequate for the world's population.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO 1	1			1	2	1		1	1	1	1		2	1	2	1
CO 2		2	1	2			3		2		3	1				
CO 3	2		2		3	1		1		2	2		1		2	
CO 4	2	3		3	2						2	2		1	2	
CO 5		2	2	2				2	2	3		1	2			3
Average	1.7	2.3	1.7	2.0	2.3	1.0	3.0	1.3	1.7	2.0	2.0	1.3	1.7	1.0	2.0	2.0

AIMT -605 E-GOVERNANCE, CLOUD COMPUTING, STANDARDS, INTEROPERABILITY AND DIGITAL PRESERVATION

Course Outcome:

CO 1: Analyse and explain the concepts of cloud computing.
CO 2: Demonstrate the types and services in cloud computing.
CO 3: Describe the Email Communications and Collaborating on Group Projects and Events.
CO 4: Illustrate and Simulate Schedules and Task Management.
CO 5: Develop Web-Based Communication Tools.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO 1	1	1		2	2				2	1	1	1	1	2	1	2
CO 2			1				3	3			3	2		2	2	
CO 3	2			1		1			2	2			1		3	1
CO 4	1	3			2			1	2		1	1		3	1	1
CO 5				1						1			2	1		1
Average	1.3	2.0	1.0	1.3	2.0	1.0	3.0	2.0	2.0	1.3	1.7	1.3	1.3	2.0	1.8	1.3

AIMT -521 DECISION SUPPORT SYSTEM

Course Outcome:

CO 1: Distinguish among data processing systems, management information systems, and decision support/expert systems.

CO 2: Integrate the major components of decision support systems (DSS) and expert systems (ES).

CO 3: Capture decision rules based on knowledge provided by an acknowledged expert and codify those rules as assertions, rules, and ad hoc procedures.

CO 4: Analyze how information is used to solve problems.

CO 5: Utilize commercial spreadsheet and database integrated packages to develop "what if" simulation models to support the decision- making process.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO 1	1	2			2			2	1	1		1	1	2	1	1
CO 2			1	2			3				3			2	2	1
CO 3	2				3	1		1		2		2	1	1		2
CO 4		3	1					1	2			3		1	3	
CO 5	1			1	2				3				2		2	3
Average	1.3	2.5	1.0	1.5	2.3	1.0	3.0	1.3	2.0	1.5	3.0	2.0	1.3	1.5	2.0	1.8

AIMT -522 KNOWLEDGE MANAGEMENT

Course Outcome:

CO 1: Use a framework and a clear language for knowledge management concepts

CO 2: Describe how valuable individual, group and organizational knowledge is managed throughout the knowledge management cycle

CO 3: Define the different knowledge types and explain how they are addressed by knowledge management

CO 4: Describe the major roles and responsibilities in knowledge management implementations

CO 5: Identify some of the key tools and techniques used in knowledge management applications

CO 6: Identify and evaluate major KM issues such as ethics, knowledge ownership vs. authorship, copyright, intellectual property and knowledge sharing incentives.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO 1	3	1	3		1	1	1	1	1	2	1	1	2	1	1	1
CO 2		2	1		2		3		2		3					
CO 3	2			2		1		2		3			1		2	
CO 4		3		2	3	2	2	2		2	2	2		2		2
CO 5	2	2		3		3			3		3		2			

CO 6			3		3			3		1				2	3	2
Average	2.3	2.0	2.3	2.3	2.3	1.8	2.0	2.0	2.0	2.0	2.3	1.5	1.7	1.7	2.0	1.7

AIMT -521 VALUE-ADDED SERVICES AND DIGITAL NETWORK INCLUDING WIRELESS AND SENSOR NETWORKS

Course Outcome:

CO 1. Understand the basics of information theory and coding techniques.

CO 2. Determine the minimum number of bits per symbol required to represent the source and the maximum rate at which a reliable Communication can take place over the channel.

CO 3. Describe and determine the performance of different waveform techniques for the generation of digital representation of signals.

CO 4. Determine methods to mitigate inter symbol interference in baseband transmission system.

CO 5. Describe and determine the performance of different error control coding schemes for the reliable transmission of digital representation of signals and information over the channel.

CO 6. Understand various spreading techniques and determine bit error performance of various digital communication systems.

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**
CO 1	2			2	2			1	2	1	1	1	2	1		1
CO 2		1	1				3				3	1			1	1
CO 3	2			1		1			2				1	2		
CO 4		3			1			2		2		2				2
CO 5	1		2	1				3			1		2		2	
CO 6		1	3		3				1	1		1		2		3
Average	1.7	1.7	2.0	1.3	2.0	1.0	3.0	2.0	1.7	1.3	1.7	1.3	1.7	1.7	1.5	1.8

AIMT -524 AGRICULTURAL BIOINFORMATICS

Course Outcome:

CO 1: To get introduced to the basic concepts of Bioinformatics and its significance in Biological data analysis.

CO 2: Describe the history, scope and importance of Bioinformatics and role of internet in Bioinformatics.

CO 3: Explain about the methods to characterize and manage the different types of Biological data.

CO 4: Classify different types of Biological Databases.

CO 5: Introduction to the basics of sequence alignment and analysis.

CO 6: Overview about biological macromolecular structures and structure prediction methods.

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**
CO 1	2	2		1	1	2		1	2		1	1	1	1	3	1
CO 2			1				3		1		3			1		
CO 3	2			2		1		1		2		2	1		2	
CO 4		3	2		2		2				2					2
CO 5	3	1		3				2		1		3	2		2	
CO 6			3		3	3				1				2		
Average	2.3	2.0	2.0	2.0	2.0	2.0	2.5	1.3	1.5	1.3	2.0	2.0	1.3	1.3	2.3	1.5

AIMT -621 AGRICULTURAL CREDIT AND FINANCIAL INCLUSION

Course Outcome:

CO 1: Understand the institutional and non-institutional sources of credit system and various banks related.

CO 2: Basic components of business management in agriculture.

CO 3: Analyse the factors associated with agricultural business.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO 1	1			2	2	1		1		1		1	2	1	1	
CO 2			1				3		2		3				2	1
CO 3	2			3		1					2		1			
Average	1.5		1	2.5	2	1	3	1	2	1	2.5	1	1.5	1	1.5	1

AIMT -622 GEO INFORMATICS

Course Outcome:

CO 1: Give examples of interdisciplinary applications of Geospatial Information Science and Technology.

CO 2: Apply GIS analysis to address geospatial problems and/or research questions.

CO 3: Demonstrate proficiency in the use of GIS tools to create maps that are fit-for-purpose and effectively convey the information they are intended to.

CO 4: Effectively communicate and present project results in oral, written, and graphic forms.

CO 5: Demonstrate confidence in undertaking new (unfamiliar) analysis using GIS, troubleshoot problems in GIS, and seek help from software/website help menus and the GIS community to solve problems.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO 1	1		2			2		3	1	1		1	2	3	1	1
CO 2			1				3				3	2		2		2
CO 3	2			3		1			2				1		1	
CO 4		3			2			1		2		2		2		3
CO 5													2		3	
Average	1.5	3.0	1.5	3.0	2.0	1.5	3.0	2.0	1.5	1.5	3.0	1.7	1.7	2.3	1.7	2.0

AIMT -623 CLIMATE CHANGE AND ITS IMPACT ON AGRICULTURAL PRODUCTION

Course Outcome:

CO 1: Understand the physical basis of the natural greenhouse effect, including the meaning of the term radioactive forcing

CO 2: Know something of the way various human activities are increasing emissions of the natural greenhouse gases, and are also contributing to sulphate aerosols in the troposphere

CO 3: Demonstrate an awareness of the difficulties involved in the detection of any unusual global warming 'signal' above the 'background noise' of natural variability in the Earth's climate and of attributing (in whole or in part) any such signal to human activity

CO 4: Understand that although a growing scientific consensus has become established through the IPCC, the complexities and uncertainties of the science provide opportunity for climate sceptics to challenge the Panel's findings.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO 1	3	2			2			1	2	1			1	2	1	
CO 2			1				3				3					3
CO 3	2			2		1		2				2	1		2	
CO 4		3			1				1							
Average	2.5	2.5	1	2	1.5	1	3	1.5	1.5	1	3	2	1	2	1.5	3

A**IMT -624 STRATEGIC RESEARCH AND EXTENSION PLAN (SREP) FOR AGRICULTURAL DEVELOPMENT**

Course Outcome:

CO 1: To review the SREP methodology followed in the pilot districts with a focus on linkages and identification and prioritization of research, extension and development issues

CO2: To analyse the mechanism followed in each state for implementation of SREP outputs in operationalizing strategies evolved

CO 3: To identify the gaps in SREP methodology and its implementation process and suggest appropriate measures to overcome the gaps, and

CO 4: To evolve future directions for up-scaling and institutionalization of SREP approach.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO 1	3			3	1			1	2	1		2	1	2		1
CO 2		2	1				3				3			2	3	
CO 3	2			2		1		2		1		2	1			2
CO 4		3			2				3		1				1	
Average	2.5	2.5	1	2.5	1.5	1	3	1.5	2.5	1	2	2	1	2	2	1.5

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Course Outcome:

CO 1: Students will demonstrate the ability to perform close and critical readings.

CO 2: Students will demonstrate the ability to consider critically the motives and methods of scholarship and the relationship bet them.

CO 3: Students will demonstrate the ability to distinguish opinions and beliefs from researched claims and evidence and reco that kinds of evidence will vary from subject to subject. For instance, some fields call for quantitative support while others more commonly with quoted, textual evidence.

CO 4: Students will demonstrate the ability to ask disciplinarily appropriate questions of the material and recognize when lin inquiry fall outside of disciplinary boundaries.

CO 5: Students will demonstrate the ability to evaluate, credit, and synthesize sources.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO 1	2			3	1			1	2	1	1	2	1	2	1	1
CO 2		2	1				3				3		2	2	3	
CO 3	2			2		1		2		1		2	1			2
CO 4		2	2		2				3	1	1			3	1	2
CO 5		2									1	2		1		3
Average	2.0	2.0	1.5	2.5	1.5	1.0	3.0	1.5	2.5	1.0	1.5	2.0	1.3	2.0	1.7	2.0