

# MAPPING



2016-17

2017-18

2018-19

2019-20

2020-21

<p>BAMS</p> <p>B.TECH. (C.E)</p> <p>B.TECH. (M.E)</p> <p>B.PHARMACY (ALLOPATHY) B.SC. HONS (AGRICULTURE) M.PHARMA (PHARMACEUTICS)</p> <p>M.TECH. (C.E.) M.TECH. (M.E.) M.A.EDUCATION</p> <p>M.B.A. M.SC.ZOOLOGY</p> <p>M.SC. CHEMISTRY</p> <p>B.P.T.</p> <p>PH.D. CHEMISTRY</p> <p>PH.D. ZOOLOGY PH.D. PHARMACY</p>	<p>BAMS</p> <p>B.TECH. (C.E)</p> <p>B.TECH. (M.E) B.PHARMACY (ALLOPATHY) M.PHARMA (PHARMACEUTICS)</p> <p>B.SC. HONS (AGRICULTURE) M.TECH. (C.E.) M.TECH. (M.E.)</p> <p>M.A.EDUCATION M.B.A.</p> <p>M.SC.ZOOLOGY</p> <p>M.SC. CHEMISTRY</p> <p>B.P.T.</p> <p>M.TECH. C.S.E. B.Tech C.S.E.</p> <p>M.SC. MATHEMATICS M.PHARMACY (PHARMACEUTICAL CHEMISTRY)</p> <p>PH.D. CHEMISTRY PH.D. ZOOLOGY</p> <p>PH.D. MANAGEMENT PH.D. EDUCATION</p> <p>PH.D. PHARMACEUTICS</p> <p>PH.D. PHARMACEUTICAL CHEMISTRY</p>	<p>BAMS</p> <p>B.TECH. (C.E)</p> <p>B.TECH. (M.E) B.PHARMACY (ALLOPATHY) M.PHARMA (PHARMACEUTICS)</p> <p>B.SC. HONS (AGRICULTURE) M.TECH. (C.E.) M.TECH. (M.E.)</p> <p>M.A.EDUCATION M.B.A.</p> <p>M.SC.ZOOLOGY</p> <p>M.SC. CHEMISTRY</p> <p>B.P.T.</p> <p>M.TECH. C.S.E.</p> <p>M.SC. MATHEMATICS M.PHARMACY (PHARMACEUTICAL CHEMISTRY)</p> <p>M.SC. MATHEMATICS M.PHARMACY (PHARMACEUTICAL CHEMISTRY)</p> <p>PH.D. CHEMISTRY PH.D. ZOOLOGY</p> <p>PH.D. EDUCATION</p> <p>PH.D. PHARMACEUTICS</p> <p>PH.D. PHARMACEUTICAL CHEMISTRY</p>	<p>BAMS</p> <p>B.TECH. (C.E)</p> <p>B.TECH. (M.E) B.PHARMACY (ALLOPATHY) M.PHARMA (PHARMACEUTICS)</p> <p>B.SC. HONS (AGRICULTURE) M.TECH. (C.E.) M.TECH. (M.E.)</p> <p>M.A.EDUCATION M.B.A.</p> <p>M.SC.ZOOLOGY</p> <p>B.P.T.</p> <p>M.TECH. C.S.E.</p> <p>M.SC. MATHEMATICS M.PHARMACY (PHARMACEUTICAL CHEMISTRY)</p> <p>PH.D. ZOOLOGY PH.D. EDUCATION</p> <p>PH.D PHARMACEUTICAL SCIENCES</p> <p>M.PHARMA (Pharmacognosy)</p> <p>B.Pharmacy Practice</p> <p>BA.BED</p> <p>BSD BED</p> <p>B.TECH CSE</p>	<p>BAMS</p> <p>B.TECH. (C.E)</p> <p>B.TECH. (M.E) B.PHARMACY (ALLOPATHY) M.PHARMA (PHARMACEUTICS)</p> <p>B.SC. HONS (AGRICULTURE) M.TECH. (C.E.) M.TECH. (M.E.)</p> <p>M.A.EDUCATION M.B.A.</p> <p>M.SC.ZOOLOGY</p> <p>B.P.T.</p> <p>M.TECH. C.S.E</p> <p>M.SC. MATHEMATICS M.PHARMACY (PHARMACEUTICAL CHEMISTRY)</p> <p>PH.D. ZOOLOGY PH.D. EDUCATION</p> <p>PH.D PHARMACEUTICAL SCIENCES</p> <p>M.PHARMA (Pharmacognosy)</p> <p>PHD CSE</p> <p>PHD ME</p> <p>BABED</p> <p>BSE BED B..TECH CSE</p>	<p>MSC PLANT PATHOLOGY MSC ENTOMOLOGY</p> <p>MA ECONOMICS BSE MLT</p> <p>MSC AGRONOMY</p>
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# **COURSE OUTCOMES**

# SCHOOL OF PHYSIOTHERAPY

## Programme outcomes and course outcomes

### PROGRAMME OUTCOMES:

- It is a rewarding career in field of medical science.
- Physiotherapy or Physical Therapy is an allied health profession that helps people increase, maintain or restore their physical mobility, function and strength.
- BPT course is a full-time course. Duration of the course is 4 years and six months followed by compulsory six months rotatory internship in leading hospitals. The four years include theoretical classes and clinical exposure in multi-specialty hospitals.
- After completing the course, a student can opt for working in any hospital or can run their own clinical setups. They can go for higher studies after BPT.
- Various specialization options are available for students in the field of physiotherapy orthopedics, neurology, cardiopulmonary, sports, pediatrics, gynecology, musculoskeletal etc.

### COURSE OUTCOMES:

#### BPT 1<sup>ST</sup> YEAR

1. **ANATOMY (AUBPT) -101:** It focus on structural components of various body systems at microscopic and macroscopic level. Provides students with the working knowledge of the structure of the human body which is essential foundation for their clinical skills.
2. **PHYSIOLOGY (AUBPT-102) :** It deals with the study of functioning of various body systems. It gives students an in depth knowledge of fundamental reactions in human body.
3. **BIOCHEMISTRY ( AUBPT-103) :** It focus on chemical components and various biochemical reactions occurring in different body systems
4. **ELECTROTHERAPY-I (AUBPT-104) :** It focus on basics of electro-physics and some electrical modalities used for therapeutic purpose. It helps students to make a clinical decision knowing the condition, techniques, indication and contraindication, dosage, etc in various conditions.
5. **EXERCISE THERAPY-I (AUBPT-105) :** It focus on basics of therapeutic exercises and their applications
6. **ENGLISH (AUBPT-106) :** It focus on improving vocabulary and communication skills
7. **COMPUTER APPLICATION (AUBPT-107):** It focus on learning basic computer programs and their uses

### COURSE OUTCOMES:

#### BPT 2<sup>ND</sup> YEAR

1. **PATHOLOGY &MICROBIOLOGY( AUBPT-201) :** It focus on nature and causes of disease and various micro organism responsible for disease
2. **PHARMACOLOGY (AUBPT-202) :** It focus on different classes of drugs, their action, uses and adverse effects on various systems of body.
3. **EXERCISE THERAPY-II (AUBPT-203) :** It focus on various therapeutic exercises and their clinical applications

4. **Electrotherapy-II** (AUBPT-204) : It focus on various electrical modalities and their uses in different conditions.
5. **BIOMECHANICS** (AUBPT-205 ) : study the basic concepts of human movement & application of various biomechanical principles in evaluation & treatment of various disorders
6. **SOCIOLOGY** ( AUBPT-206 ) : helps with basic social concepts, principles, process in relation to individual, family & community & help students while assessment & treatment.
7. **PSYCHOLOGY** (AUBPT-207) : Helps in understanding various behavioral patterns of various age groups & helps in developing communication & interacting skills.

#### **COURSE OUTCOMES:**

#### **BPT 3<sup>rd</sup> YEAR**

1. **ORTHOPEDECS** (AUBPT-301): Understanding orthopedic conditions causing disability (etiology, clinical features, investigations & management)
2. **GENERAL MEDICINE** (AUBPT-302): General understanding of disease providing knowledge about relevant aspects of general medicine
3. **PT IN ORTHO-CONDITION** (AUBPT-303): Understanding orthopedic conditions causing disability (etiology, clinical features, investigations & Physiotherapy management)
4. **PT IN MEDICAL-CONDITION** (AUBPT-304): General understanding of disease providing knowledge about relevant aspects of general medicine & physiotherapy management
5. **RESEARCH METHODOLOGY AND BIO- STATISTICS** (AUBPT-305): Helps the student to understand the basic principles of research & methods applied to draw the interferences from research findings

#### **COURSE OUTCOMES:**

#### **BPT 4<sup>th</sup> YEAR**

1. **GENERAL SURGERY** (AUBPT – 401) : Understanding various conditions & their surgical management, complications.
2. **NEUROLOGY** (AUBPT – 402): Understanding neurological conditions causing disability (etiology, clinical features, investigations & management)
3. **PEDIATRICS & GERIATRICS** (AUBPT – 403): Understanding various conditions in children & elderly respectively, causing disability (etiology, clinical features, investigations & management)
4. **PT IN NEUROLOGICAL CONDITIONS** (AUBPT – 404): General understanding of disease providing knowledge about relevant aspects of general medicine & physiotherapy management
5. **PT IN SURGICAL CONDITIONS** (AUBPT – 405) : Understanding various conditions following surgery and their pre & post operative management
6. **PRINCIPLE OF REHABILITATION** (AUBPT – 406) : Learning skills applied in clinical situation of health & disease & its preventions
7. **APPLIED THERAPEUTICS** (AUBPT – 407): It focus on evidence based therapeutic techniques applied for various conditions

## COURSE OUTCOME OF BAMS

<b>BAMS 1st Year</b>	
PADARTHA VIGYAN AND AYURVED ITIHAS	It explains the fundamental principles of Ayurveda
SANSKRIT	In Ayurveda it is studied because there is extensive use of this in Ayurvedic literature
KRIYA SHARIR	It explores the normal functions of human organs
RACHANA SHARIR	It deals with the study of human body, it is important for operative procedures and practices
MAULIK SIDDHANT AVUM ASTANG HRIDYA	Root source for Ayurvedic philosophy and protocol providing clear guidelines in all aspects of health
<b>BAMS 2nd Year</b>	
DRAVYAGUNA VIGYAN	It explains the versatile action of Ayurvedic drugs
ROG-NIDAN	It contains many elements for diagnosis and prognosis of diseases and it also gives vast knowledge about examination of diseases and patients
RASASHATRA	It basically deals with the preparation of Ayurvedic medicines using herbomineral drugs, main objective is to prepare various Ayurvedic formulations so as to impart practical knowledge to students
CHARAK SAMHITA P	It explains the basic fundamentals of Ayurvedic literature
<b>BAMS 3rd Year</b>	
AGADTANTRA	Deals with the study of poison, its therapeutic concern and medico-legal importance
SWASTHAVRITTA & YOGA	It highlights the importance of maintaining of healthy life by adopting principles of a daily regimen, seasonal regimen and ethical regimen to combat the diseases associated with lifestyle changes.
PRASUTI TANTRA EVUM STRI ROGA	It deals with the delivery of child and diseases pertaining to female reproductive system
KAUMARBHRITYA PARICHAYA	This branch deals with neonatal care, infant feeding, diet for newborn, daily and seasonal regimen and also deals with diseases and disorders relating to children including nutrition and immunization of children
CHARAK SAMHITA U	It explains the basic fundamentals of Ayurvedic treatment regimens
<b>BAMS 4th Year</b>	
KAYACHIKITSA	It involves general principles and approaches related to the treatment procedure. It also offers health benefits in case of ageing or geriatrics health issues
PANCHKARMA	It deals with the purificatory procedures that helps in rejuvenating, revitalization, prevention and treatment of acute and chronic diseases.
SHALYA TANTRA	Deals with the surgical procedures with less complications, minimum blood loss and least reoccurrence of disease like Kshar Sutra Karma in anorectal region
SHALAKYA TANTRA	It deals with the diseases above the clavicle i.e. concerned with disorders of ear, nose, throat, eye, dental, head & neck. It includes various preventive measures, therapeutic measures and surgical methods also.
RESEARCH METHODOLOGY AND MEDICAL STATISTICS	Specific procedures/techniques used to identify, select, process and analyse information about the topic

COURSE OUTCOME OF D.PHARMACY (AYU)	
D.Pharmacy (Ayu) 1s Year	
RASASHATRA AND BHAISAJYA KALPANA-I	It basically deals with the preparation of Ayurvedic medicines using herbomineral drugs, main objective is to prepare various Ayurvedic formulations so as to impart practical knowledge to students
PRATHMIK UPCHAR AND RUGNPARICHARYA	It deals with the management of patients by the help of emergency medicines and equipments. It also provides the complete knowledge about the health, its maintenance by following daily regimen, seasonal regimen, and prevention of diseases
SHARIR RACHANA	It deals with the study of human body, it is important for operative procedures and practices
DRAVYAGUNA-I	It explains the versatile action of Ayurvedic drugs
AYURVEDA SIDDHANT AND ITIHAS	It explains the fundamental principles of Ayurveda and gives history of Ayurveda literature
D.Pharmacy (Ayu) 2nd Year	
KRIYA SHARIR	It explores the normal functions of human organs
DRAVYAGUNA-II	It explains the versatile action of Ayurvedic drugs
AYURVEDIC PHARMACEUTICS INCLUDING HOSPITAL AND CLINICAL PHARMACY	It gives knowledge about the preparation of medicines and practicals on drugs manufacture
RASASHATRA AND BHAISAJYA KALPANA-II	It basically deals with the preparation of Ayurvedic medicines using herbomineral drugs, main objective is to prepare various Ayurvedic formulations so as to impart practical knowledge to students
AYURVEDA PARICHARYA INCLUDING ROGA NIDAN AND CHIKITSA	It contains many elements for diagnosis and prognosis of diseases and it also gives vast knowledge about examination of diseases and patients



BACHELOR OF SCIENCE IN  
MEDICAL LAB TECHNOLOGY  
(BSC-MLT)

**Course Outcome**

## **Programme Name: B.Sc. Medical Laboratory Technology**

### **Programme Objectives:**

- To train students to work as full-fledged lab technologists capable of collecting and storing samples, analyzing them and creating reports based on the sample for further analysis by a doctor.
- To introduce students with elements of blood bank management, materials management, supply chain management as well as lab information system management.
- To train students to clean and maintain lab equipment, manage biomedical.

### **Programme Outcome (POs)**

- Professionally competent to perform basic laboratory test and analyse them so as to choose an appropriate course of action.

### **Programme Specific Outcomes (PSOs)**

- Students will acquire necessary knowledge and skills to work as full-fledged lab technologists capable of collecting and storing samples, analyzing them and creating reports based on the sample for further analysis by a doctor.
- Students will have knowledge of elements of blood bank management, materials management, supply chain management as well as lab information system management.
- Students will be skilled to clean and maintain lab equipment, manage biomedical.
- Professionally competent – Possess commitment to lifelong learning
- Exhibit sense of commitment to the ethical and human aspects of patients care.
- Recognize the role of the clinical laboratory technician in the assurance of quality health care.

## **Semester-1**

### **Human Anatomy**

**Course Code: BSCMLT 101**

### **COURSE OUTCOMES:**

- The prime concern of this syllabus is to learn the terminology of the subject and basic knowledge of cells & tissues and to understand anatomy of human body.
- This subject will develop an understanding of the structure and function of organs and organ systems in normal human body.



**Human Physiology-I**  
**Course Code: BSCMLT 102**

**Course Outcomes**  
**Course Code: BS**

- The prime concern of this syllabus is to integrate basic knowledge of cells, tissues, blood, physiological functions and diseases of system included in syllabus.
- To be able to perform the tests or techniques to evaluate the functions of organ systems
- To be efficient to handle the equipment related to these tests.
- To be able to derive, analyse, interpret the test results
- To be able to differentiate the normal and abnormal test results

**Basic Haematology and Clinical Pathology**  
**Course Code: BSCMLT 103**

**COURSE OUTCOMES:**

- The curriculum of haematology aims to prepare the students in basic understanding of the composition of blood, waste management, instrumentation, techniques and methods of estimating different parameters.
- Describe the rationale & principles of technical procedures of diagnostic laboratory tests.
- Interpret diagnostic laboratory tests & correlate with clinical & Morphological features of diseases.
- Perform simple bedside tests on blood, urine and other biological fluid samples

**Fundamentals of Biochemistry-I**  
**Course Code: BSCMLT 104**

**COURSE OUTCOMES:**

- This syllabus has been formulated to impart basics knowledge of biochemistry, apparatus, units, equipment, and volumetric analysis in the Clinical Biochemistry.
- At the end students should able to understand factors affecting enzyme activity and their biological importance; enzyme inhibition and its clinical significance. enzymes & is enzyme and their diagnostic uses
- Able to understand principles of various instruments involved in lab investigations.
- pH homeostasis and water electrolyte balance & related disorders

**Preventive Medicine & Community Health Care**  
**Course Code: BSCMLT 105**

**COURSE OUTCOMES:**

- This curriculum impart the knowledge of various types of diseases and functioning of various programmes.
- Demonstrate compassionate care at the individual, family, group, organization, community and population levels
- Recognize and respond to the ethical dimensions in public health and relevant clinical decision-making
- Demonstrate medical expertise in situations other than patient care, such as providing expert legal testimony and advising governments

# Semester II

**Diagnostic Molecular Biology**  
**Course Code: BSCMLT 201**

**COURSE OUTCOMES:**

- This syllabus provides a basic introduction of molecular biology and its techniques like PCR, RTPCR etc.
- Basic knowledge of structure and functions of major bio-molecules will make the students to understand and implement the acquired knowledge in future

**Human Physiology-II**  
**Course Code: BSCMLT 202**

**COURSE OUTCOMES:**

- This subject imparts the knowledge of the structure and function of included organs and organ systems in normal human body.
- Conduct of laboratory investigations using safe, environmentally appropriate, and ethical practices.
- Describe the characteristics of living things that distinguish them from non-living things

**Clinical Endocrinology & Toxicology**  
**Course Code: BSCMLT 203**

**COURSE OUTCOMES:**

- This paper is framed to provide basic knowledge of hormones & toxic substances with their determination techniques as well as related disorders.
- Have the basic understanding and pathophysiological mechanisms of various diseases.
- Will understand the mechanism of progression of the disease pathology and strategies for intervention.
- Will have an idea of worldwide epidemiology of the diseases.

**Fundamentals of Biochemistry -II**  
**Course Code: BSCMLT 204**

**COURSE OUTCOMES:**

- This paper is extension of BML-S-104 and which aims at understanding the chemical properties of the bio molecules, their functions and biomedical importance.
- Student will understand and demonstrate fundamental biochemical principles, such as the structure/function of biomolecules, metabolic pathways, and the regulation of biological/biochemical processes

**Fundamentals of Computer**  
**Course Code: BSCMLT 205**

**COURSE OUTCOMES:**

- The objective of this course is to acknowledge, appreciate and effectively incorporate the basic of computers with its applications.
- Analysing problems, and designing and implementing algorithmic solutions.
- Solving problems properly, achieving an implementation that is correct, effective and efficient.
- Using computers at user level, including operative systems and programming environments.
- Knowledge of computer equipment, including both hardware and software.
- Identifying information needs to solve problems, recovering information and applying it to the resolution

**SEMESTER III**

**Clinical Heamatology**  
**Course Code: BSCMLT 301**

**COURSE OUTCOMES:**

- This subject imparts the knowledge of the structure and function of included organs and organ systems in normal human body.
- Demonstrate an understanding of the components of human blood and characteristics, functions, and abnormalities and disease states of each.
- Demonstrate proficiency in the skills necessary to perform blood cell counts, and evaluation of blood elements within stated limits of accuracy.
- Demonstrate compliance with OSHA safety regulations for blood –borne pathogens.
- Determine suitability of hematology specimens and dispose of them in the appropriate biohazard containers.

**Fundamentals of Microbiology-I**  
**Course Code: BSCMLT 302**

**COURSE OUTCOMES:**

- Learn the concept of sterilization processes and apply them in sterilization of different media.
- Acquire skills to isolate an organism using different technique and to Know various Culture media and their applications.
- Attain the practical skills in microscopy and their handling techniques and staining procedures
- Identification of pathogens by standard techniques and methods of culturing preservation and maintenance of microorganisms

## **Immunology & Serology**

### **Course Code: BSCMLT 303**

#### **COURSE OUTCOMES:**

- To promote critical thinking among students
- To provide students with a foundation in immunological processes
- To provide students with knowledge on how the immune system works building on their previous knowledge from biochemistry, genetics, cell biology and microbiology
- Be able to clearly state the role of the immune system
- Be able to compare and contrast the innate versus adaptive immune systems

## **Histopathology & Histotechniques-I**

### **Course Code: BSCMLT 304**

#### **COURSE OUTCOMES:**

- Define all the terms given in bold
- Outline key features of a number of pathological processes
- Relate the histological appearance of affected tissues to the underlying pathology
- Recognise the histological appearance of a number of pathological tissues
- Understand how sections can be photographed, presented and reported.

## **Environmental Sciences**

### **Course Code: BSCMLT 305**

#### **COURSE OUTCOMES:**

- Master core concepts and methods from ecological and physical sciences and their application in environmental problem solving.
- Master core concepts and methods from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions.
- Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.
- Understand the transnational character of environmental problems and ways of addressing them, including interactions across local to global scales.
- Apply systems concepts and methodologies to analyze and understand interactions between social and environmental processes.

**Clinical Biochemistry**  
**Course Code: BSCMLT 401**

**COURSE OUTCOMES:**

- Students will be able to clinically assess the laboratory indicators of physiologic conditions and diseases
- Students will know the biochemical and molecular tools needed to accomplish preventive, diagnostic, and therapeutic intervention on hereditary and acquired disorders

**Fundamentals of Microbiology-II**  
**Course Code: BSCMLT 402**

**COURSE OUTCOMES:**

- To understand history, relevance of microbiology and classification of bacteria
- To understand the working of various microscopes and their application
- To gain knowledge of various (physical and chemical) methods of control of microorganisms and safety measures to be followed while handling microbes
- To understand the structure of bacterial cells, its organelles, physiology and behavior
- To learn different methods of staining bacteria
- To demonstrate proficiency in handling aseptic bacteriological specimens

**Advance Diagnostic Techniques**  
**Course Code: BSCMLT 403**

**COURSE OUTCOMES:**

- students would be able to detect hormones and toxic substances in blood samples and also understand the basis of endocrine disorders.
- To provide basic knowledge of hormones & toxic substances with their determination techniques as well as related disorders

**Histopathology & Histotechniques-II**  
**Course Code: BSCMLT 404**

**COURSE OUTCOMES:**

- Students will be able to receive process and preserve tissue samples (routine and special).
- They will be able to handle different automated instruments used for above tests

**General Pathology**  
**Course Code: BSCMLT 405**

**COURSE OUTCOMES:**

- The student will be able to devise likely diagnoses from clinical scenarios by recognizing key manifestations of congenital, hemodynamic, inflammatory, infectious, metabolic, environmental, and neoplastic diseases.
- The student will be able to apply knowledge of pathology's role in the diagnosis, staging, and management of disease.
- The student will be able to classify diseases of various body systems and how they manifest clinically and histopathologically.

**Immunoheamatology & Blood Banking**  
**Course Code: BSCMLT 501**

**COURSE OUTCOMES:**

- Developing a working knowledge of the principles and procedures of blood bank testing.
- Producing accurate, skilled clinical laboratory workers with strong ethical and professional values.
- Promoting respect and understanding of allied health professionals through renewed understanding of the clinical laboratory technician's role as a member of the allied health care team

**Clinical Enzymology & Automation**  
**Course Code: BSCMLT 502**

**COURSE OUTCOMES:**

- Describe plasma enzymes
- Explain about the assessment of cell damage and proliferation
- Describe the role of enzymes in health and diseases

**Parasitology**  
**Course Code: BSCMLT 503**

**COURSE OUTCOMES:**

- Distinguish the individual parasitic infectious diseases
- Distinguish the individual helminthic infectious disease
- Explain the methods used for diagnosis and treatment of helminthic infectious diseases
- Explain the methods used for diagnosis and treatment of nematodal infectious diseases



**Diagnostic Cytology**  
**Course Code: BSCMLT 504**

**COURSE OUTCOMES:**

- Understanding and skills in practical work in the identification, classification of malignant and pre-malignant conditions in cell preparation in cytologic investigation of serous liquid, fine needle aspiration and other fields of application in cytology.
- The practical parts will focus on developing the ability to diagnose cell samples from clinical materials with microscope.

**Principles of Laboratory Management**  
**Course Code: BSCMLT 505**

**COURSE OUTCOMES:**

- Understand the management of laboratory operations and processes.
- Understand how to manage teams in a laboratory.
- Have the ability to create a productive work environment with a basic understanding of leadership and change management.
- Have the ability to control costs and understand financial management.
- Understand the management of quality assurance in a laboratory

**Clinical Virology**  
**Course Code: BSCMLT 601**

**COURSE OUTCOMES:**

- Explain viruses, fungi and parasites including their classification, morphology, and laboratory diagnosis and prevention measures
- Perform laboratory investigations for the diagnosis of infectious diseases caused by viruses, fungi and parasites
- Discuss various viral fungal and parasitic diseases of human.

**Biostatistics & Research Methodology**  
**Course Code: BSCMLT 602**

**COURSE OUTCOMES:**

- Improve analytical and critical thinking skills through problem solving
- Understand the steps involved in statistical investigations
- Identify the fundamental idea and ethical
- approach to carry out original research in biology

## B.Sc. B.Ed. (Courses Outcomes)

### Semester-1<sup>st</sup>

Course Code: AUBSCED 101

General Hindi

Course Outcomes:

- छात्रों में भाषा को समझने तथा मूल्यांकन करने की दृष्टि बढ़ाना
- शब्द संरचना प्रक्रिया के प्रति छात्रों का ध्यानाकर्षण कराना
- छात्रों को प्रयोजनमूलक हिन्दी की व्यापकता से अवगत करवाना
- हिन्दी भाषा की व्यावहारिक उपयोगिता का परिचय देना

Course Code: AUBSCED 102

Trigonometry & Differential Calculus

Course Outcomes:

- To understand the topics on the expansions of trigonometric functions, hyperbolic functions, inverse circular, inverse hyperbolic, expansion of functions.
- To show how Trigonometry can be used to evaluate Calculus.
- To explain the distinction between a Trigonometry & Differential Calculus.

Course Code: AUBSCED 103

Mechanics

Course Outcomes:

- To compute basic quantities in linear and rotational mechanics
- To formulate, analyze and solve a multi-level problem in mechanics.
- To apply mathematical tools to mechanics.

Course Code: AUBSCED 104

Organic Chemistry

Course Outcomes:

Nucleophilic substitution reactions & their mechanism is of great interest for the students. The preparation of organometallic compounds & its uses gives many new syntheses. Acidic character of phenol & different named reactions has been explained to the students. Ether, epoxides, carbonyl compounds & carboxylic acids have been studied in details with their physical & chemical properties.

Course Code: AUBSCED 105

Diversity of Microbes and Cryptogams (Thallophyta)

Course Outcomes:

- Students will learn about the general characters of Cryptogams.
- Students will learn the basic concept of Botany.
- Students will gain knowledge about the plant diseases.

Course Code: AUBSCED 106

Animal Diversity Part-I

Course Outcomes:

As an outcome we are expecting the students will understand and learn the differences in the cellular organization of the organism at different levels and they will be able to write and draw the structure of various organisms.

## Semester-2<sup>nd</sup>

Course Code: AUBSCED 201

Environmental Studies

Course Outcomes:

- To create awareness among students about environment protection. Course Outcomes
- Based on this course, the students will understand / evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn help in sustainable development.

Course Code: AUBSCED 202

Computer Fundamentals, Internet & MS-Office

Course Outcomes:

After studying this course, the students will be able to:

- Understand the fundamental hardware components that make up a computer's hardware and the role of each of these components.
- Understand the difference between an operating system and an application program, and what each is used for in a computer.
- Describe some examples of computers and state the effect that the use of computer technology has had on some common products.
- Be familiar with software application.
- Understand file management.

Course Code: AUBSCED 203

Partial Differential Equations

Course Outcomes:

- To acquaint the students with various mathematical techniques viz. variable separable method, Monge's form of solution, Classification and application of Partial Differential Equation.
- To learn the Nonlinear first order PDEs which arise in fluid dynamics, continuum mechanics and optics.

Course Code: AUBSCED 204

Electricity and Magnetism

Course Outcomes:

After completion of the course, students will be able to understand:

- The basic concept of electric field and potential and the method of their calculation using Gauss Law.
- Basics of dielectric polarization of matter, capacitor.
- The applications of magnetic field, ampere law etc.

Course Code: AUBSCED 205

Inorganic Chemistry

Course Outcomes:

After completion of the course, student will be able to understand

- The Schrödinger equation which provides explanation about the origin of Quantum number, shape of atomic orbital.
- Student will learn the periodicity of elements in which they understand the effective nuclear charge, enthalpy, electronegativity required to understand trend in periodic table and predicting their chemical behavior.
- The course also provides a detail understanding of covalent, ionic bond.
- A basic understanding of metallic bond hydrogen bond.

Course Code: AUBSCED 206

Diversity of Microbes and Cryptogams  
(Bryophyta, Pteridophyta and Paleobotany)

Course Outcomes:

- Students will learn about the general characters of Bryophyta.
- Students will learn the general characters of Pteridophyta
- Students will learn the basic concept of fossil Bryophyta through Geological time scale.

Course Code: AUBSCED 207

Animal Diversity Higher Non-Chordata

Course Outcomes:

The outcome will be in terms of understanding the body organization of different life forms in higher invertebrates and they will be able to explain the differences in the taxonomic characters of different phylum. Students can draw and write about the structure and functions of the cells.

### **Semester-3<sup>rd</sup>**

Course Code: AUBSCED 301

Childhood and Development Years

Course Outcomes:

- Understand the meaning, nature and scope of educational psychology.
- Understand growth and development of the learner and its importance in the learning process.
- Understand the need and problems of adolescence.
- Identify educational needs of various types of children
- Understand concept of intelligence and personality, theories of intelligence and personality and their educational implications

Course Code: AUBSCED 302

Understanding Disciplines and Subjects

Course Outcomes:

- Understand the nature of discipline and school subjects.
- Differentiate between school subjects and curriculum.
- Integrate and apply concepts and theories in real classrooms

Course Code: AUBSCED 303

Language Across the Curriculum

Course Outcomes:

- Understand the nature, importance and use of Language.
- Acquaint with some latest methods and approaches for planning of successful language teaching.

- Identify and be sensitive to the proficiency, interests and needs of learners.
- Practice learner centered methods and techniques in the classroom.
- Use technology to enrich language teaching,
- Encourage continuous professional development.

Course Code: AUBSCED 304

English

Course Outcomes:

- Students will strengthen their ability to write academic papers, essays and summaries using the process approach.
- To recognize poetry from a variety of cultures, languages and historic periods.
- To understand and appreciate poetry as a literary art form.
- To analyze the various elements of poetry, such as diction, tone, form, genre, imagery, figures of speech, symbolism, theme, etc.

Course Code: AUBSCED 305

Real Analysis

Course Outcomes:

- To understand various limiting behaviour of sequences & series; limiting processes viz. continuity, uniform continuity; Sequence of real numbers, Tests and to enhance the mathematical maturity and to work comfortably with concepts.
- To understand the concepts of real in depth.
- To analyze the world of formal/abstract mathematics in which formal proofs and definitions are used in abundance.

Course Code: AUBSCED 306

Optics

Course Outcomes:

The students will be able to-

- To understand the fundamentals of physics like geometrical optics: diffraction, interferometer and holography etc.
- Get the idea of geometrical optics including the wave motion
- Provide basic and advanced concept of holography, interference and diffraction.

Course Code: AUBSCED 307

Physical Chemistry

Course Outcomes:

- Gaseous state will be studied taking ideal gas equation & modification of the ideal gas equation.
- Liquefaction of gases and critical temp, pressure & volumes for enhancing the interest of the student.
- The student will be able to find out a detailed knowledge of applicability of different states of matter in our day-to-day life.
- Explanation of the phenomenon of liquefaction of gases will be easier.

Course Code: AUBSCED 308

Plant Taxonomy and Embryology

Course Outcomes:

- Students will learn the systematic position of flowering plants.
- Students will be able to do identification of plants using scientific classification.
- Students will learn to describe the general leaf, flower and fruit characteristics of members of the Angiosperm family.

Course Code: AUBSCED 309

Chordata

Course Outcomes:

Upon the completion of the semester the students are expected to explain taxonomy of different classes and their difference. The physiology, structure and life histories of animals fall in this category.

## **Semester-4<sup>th</sup>**

Course Code: AUBSCED 401

Learning and Teaching

Course Outcomes:

The students will be able to:

- Understand the nature, characteristics of learner and principles to make teaching-learning effective and productive.
- Explain the concept, nature of learning as a process and conditions of learning.
- Describe the Gagne's types of learning.
- Explain the concept, types and strategies to develop memory.
- Understand nature, causes, factors and strategies to minimize forgetting.
- Apply the knowledge and understanding of the learning process, principles and theories of learning with their educational Implications.
- Describe the concept, Importance and level of transfer of learning.

Course Code: AUBSCED 402

Drama and Art in Education

Course Outcomes:

The students will be able to:

- Understand the concept and importance of various arts in human life.
- Understand aims, objectives and principles of performing and visual arts.
- Appreciate Indian folk and visual and performing arts.
- Understand various methods and techniques of teaching creative arts.
- Understand the importance of visits in arts exhibitions and cultural festivals.

Course Code: AUBSCED 403

Text Reading and Reflections

Course Outcomes:

The students will be able to:

- Learn to read Newspaper Follow Radio, TV & Internet media critically and with understanding.
- Form and exchange viewpoints on political and social Issues.
- Distinguish fact, fiction and opinion in Newspaper articles.
- Develop teachers professionally and support their aspirations as teachers.

Course Code: AUBSCED 404

English

Course Outcomes:

- The students will be able to:
- Read and comprehend better.
- Communicate in English orally and in writing.

- Participate in role plays and mini-talks.
- Refer to the dictionary for synonymous expressions and grammar.

Course Code: AUBSCED 405

Group Theory

Course Outcomes:

- Understand the importance of algebraic properties with regard to working within various number systems.
- Extend group structure to finite permutation groups (Caley Hamilton Theorem).
- Generate groups given specific conditions.
- Symmetry using group theory.
- Understand the three major concrete models of Boolean algebra: the algebra of sets, the algebra of electrical circuits, and the algebra of logic.

Course Code: AUBSCED 406

Oscillations & Waves

Course Outcomes:

The students will be able to-

- Understand the fundamentals of physics like geometrical oscillations & wave motion, electromagnetic theory, wave optics: diffraction, interferometer and holography etc.
- Get the ideas of geometrical oscillations including the wave motion.
- Provide basic and advanced concept of holography, interference and diffraction.

Course Code: AUBSCED 407

Organic & Inorganic Chemistry

Course Outcomes:

- To develop an understanding of different approaches to types of chemical bonding.
- To develop an understanding of behaviour, chemical nature of various compounds likes ether, alcohol, Phenols, Proteins, Amino acids.
- Students will be able to appreciate general trends in the chemistry of elements of gr. 13, 14,15,16,17 in Periodic table.

Course Code: AUBSCED 408

Plant Physiology and Metabolism

Course Outcomes:

- To make students capable of understanding basic physical processes occurring in plants.
- To impart Knowledge about plant growth regulators related to growth and development.
- To make student learn about the Mineral nutrition in plants.
- Students will learn about the physical processes occurring in plants.
- Students will learn the function of different plant growth regulators.

Course Code: AUBSCED 409

Evolution and Developmental Biology

Course Outcomes:

- To educate the students on the concept and theories of the evolution and embryology.
- The development of chick and placentation.
- The student will be able to explain and write the different theories given to explain the evolution during the time period like Darwinism and Lamarkism.
- To understand the developmental biology.



## Semester-5<sup>th</sup>

Course Code: AUBSCED 501

Assessment for Learning

Course Outcomes:

The students will be able to;

- Understand the nature of assessment and its role in teaching-learning process.
- Understand the different perspectives of learning on assessment.
- Realize the need for school-based assessment in schools.
- Examine the contextual roles of different forms of assessment.
- Understand the different dimensions of learning and the related assessment procedures, tools and techniques

Course Code: AUBSCED 502

Gender, School and Society

Course Outcomes:

The students will be able to:

- Develop basic understanding and familiarity with key concepts: Gender bias, gender stereotype, empowerment, equity and equality, patriarchy, matriarchy, masculinity and feminism.
- Understand some important landmarks in connection with gender and education in the historical and contemporary perspective.
- Learn about gender issues in school curriculum, textual materials across discipline, pedagogical processes and its interaction with class, caste, religion and region.

Course Code: AUBSCED 503

Inclusive School

Course Outcomes:

The students will be able to:

- Understand the concept, nature and types of disabilities.
- Identify the characteristics and need, identification of different types of disabled children. Understand the concept, nature and approaches of inclusion in education.
- Understand and reflect on models of inclusion in education.
- Acquire knowledge and understanding about the provisions made for disabled children under SSA and RTE Act, 20096.
- Understand different pedagogical and assessment techniques for inclusion of CWSN.
- Employ different pedagogical approaches for inclusion of CWSN in regular schools.

Course Code: AUBSCED 504

English

Course Outcomes:

- To know the beauty of the coherence of Language and Literature
- To demonstrate the awareness of evolution theory of language by varied culture
- To study the formation of new words
- To explore literary elements

Course Code: AUBSCED 505

Linear Algebra

Course Outcomes:

- Introduction to vector space and subspace.

- Use computational techniques and algebraic skills essential for the study of systems of Linear equations, matrix algebra, vector spaces, eigenvalues and eigenvectors, Orthogonality and Diagonalization. (Computational and Algebraic Skills).

Course Code: AUBSCED 506

Semiconductor/Solid State Devices

Course Outcomes:

The students will be able to understand:

- Solid state materials and k-space representation etc.
- Fermi distribution, DOS and carrier transport, etc.
- The processing of semiconductor devices like 1D, 2D & 3D photonic crystals.

Course Code: AUBSCED 507

Physical & Inorganic Chemistry

Course Outcomes:

- To formulate the values and attitude related to environment.
- To develop the understanding of Energy exchange processes in terms of various forms of energy, heat and work.
- To develop basic understanding of co-ordination chemistry.
- Sensitivity will develop in students towards environment.
- Students will be able to state the various laws and will be able to correlate them in day to day life.

Course Code: AUBSCED 508

Economic Botany and Plant Biotechnology

Course Outcomes:

- Students will learn about the centres of origin of different crops.
- Students will learn the origin and plant parts used in some important cash crops.
- Students will learn the latest techniques in plant biotechnology.

Course Code: AUBSCED 509

Cell Biology & Genetics

Course Outcomes:

After completion of the semester the student will be able to explain the genetics and how the traits transfers from one generation to another. They can also be able to draw and explain the structure of cell and cell organelles

## Semester-6<sup>th</sup>

Course Code: AUBSCED 601

Contemporary India & Education

Course Outcomes:

The students will be able to:

- Understand the Constitutional Provisions for Education in India.
- Understand the Fundamental Rights, Duties and Directive Principles of the State Policy.
- Develop competencies to understand the various issues related to Education and remedial measures.
- Understand the Constitutional provisions for inequality, discrimination and marginalization in UEE.
- Understand the importance of Education for the marginalized groups.
- Acquaint with the policy initiatives, educational policies and programme in Contemporary India.

Course Code: AUBSCED 602

Teaching of Physical Sciences

Course Outcomes:

The students will be able to:

- Familiarize with nature of physical science.
- Formulate instructional objectives in behavioral terms.
- Apply various approaches and methods of teaching physical science.
- Select and integrate various kinds of instructional media.

Course Code: AUBSCED 603

Teaching of Mathematics

Course Outcomes:

The students will be able to:

- Understand the nature and characteristics of Mathematics.
- Know the importance and values of teaching Mathematics.
- Understand the relationship of mathematics with other subjects of school curriculum.
- Understand aims and objective of teaching mathematics at school stage.
- Stage objective in behavioral term with reference to concepts and generalizations.
- Understand the contribution made by Indian and Western mathematician.
- Apply various methods of teaching of mathematics.
- Differentiate between method and techniques of teaching mathematics

Course Code: AUBSCED 604

Teaching of Life Sciences

Course Outcomes:

The students will be able to:

- Understand various objectives of teaching life sciences and to write the same in behavioral terms.
- Understand and apply various methods of teaching life sciences.
- Understand, analyze and improve present curriculum of life sciences operative at school level.
- Understand the importance and appropriate use of different audio visual aids and improvised apparatus in Indian conditions with reference to concepts to be taught.

Course Code: AUBSCED 605

English

Course Outcomes:

- To learn the use rather than usage of English
- To develop their critical thinking capabilities focused through the course as an important need.
- To expose to a range of contexts where the language is used to meet a variety of real life communication needs.
- To equip with the practical, emotional, intellectual and creative aspects of language by integrating knowledge and skills.
- To focus on readability, teach-ability and testability - to think beyond the text.
- To enhance practice in objective and subjective writing.

Course Code: AUBSCED 606

Numerical Analysis

Course Outcomes:

- To apply appropriate numerical methods to solve the problem with most accuracy.
- Using appropriate numerical methods determine approximate solution of ODE and system of linear equation.

- Compare different methods in numerical analysis w.r.t accuracy and efficiency of solution.

Course Code: AUBSCED 607

Thermal & Low Temperature Physics

Course Outcomes:

The students will be able to understand:

- Laws of thermodynamics, entropy, and Maxwell's thermodynamic relations etc.
- The Kinetic theory of gases-distribution of velocities, molecular collisions in Physics.
- The basics of real gases.

Course Code: AUBSCED 608

Physical & Organic Chemistry

Course Outcomes:

- To develop an understanding of important concept of Electrochemistry and various properties.
- To develop understanding of Halogen compound, carbonyl and carboxylic acid compound.
- To build solid foundation of Spectroscopy.
- Students will be able to write the mechanism of electrophilic and nucleophilic substitution reaction.
- Students will gain knowledge of spectrum, Electromagnetic radiations and other important topic related to Spectroscopy.

Course Code: AUBSCED 609

Environmental Biotechnology

Course Outcomes:

- Students will learn about the current environmental issues.
- Students will learn the role of different microorganisms in treatment of waste.
- Students will learn how the public participation can help in protection environment.

Course Code: AUBSCED 610

Mammalian Physiology

Course Outcomes:

One can expected to learn the process of physiology like digestion, respiration, excretion and blood circulation etc. They will be able to draw and write all about they had learnt.

## Semester-7<sup>th</sup>

Course Code: AUBSCED 701

Teaching of Physical Sciences

Course Outcomes:

The students will be able to:

- Select and integrate various kinds of instructional media.
- Organize various co-curricular activities.
- Select appropriate text books.
- Explain the concept of evaluation.
- Plan lessons in physical science.

Course Code: AUBSCED 702

Teaching of Mathematics

Course Outcomes:

The students will be able to:

- Identify learning difficulties in Mathematics and adopt appropriate remedial measures.
- Understand the characteristics and strategies for teaching children with special needs in Mathematics.
- Explain the importance and uses of learning resources in Mathematics.
- Appreciate the importance of Mathematics laboratory in learning Mathematics.
- Understand the role of text book, exhibition and fairs in Mathematics.
- Prepare unit and lesson plans for teaching of Mathematics.
- Construct assessment tools for evaluation Mathematics learning.

Course Code: AUBSCED 703

Teaching of Life Sciences

Course Outcomes:

The students will be able to:

- Relate the knowledge of life sciences with other subjects of school curriculum.
- Develop basic teaching skills for improvement of teaching-learning process.
- Get familiar with principles and materials for setting an ideal life science laboratory.
- Understand the present techniques of evaluation in life sciences.

## **Semester-8<sup>th</sup>**

Course Code: AUBSCED 801

Knowledge and Curriculum

Course Outcomes:

The students will be able to:

- Understand the meaning and principles of curriculum.
- Understand and appreciate curriculum as a means of development of the individual.
- Understand the foundations and evaluation of curriculum.
- Comprehend the different models of curriculum compare the view point given by different commissions.
- Develop an understanding of the concept, need, scope and functions of school management. Develop an understanding of different components of human and material resources of the school.

Course Code: AUBSCED 802

Understanding the Self

Course Outcomes:

The students will be able to:

- Understand self-concept and its importance in human life.
- Understand self-confidence and its importance in human life.
- Understand the nature, classification, sources, and methods of inculcation of human values. Understand the role of different agencies in promotion of human values.
- Define philosophy of yoga.
- Explain the psychological and physiological basis of yoga.

Course Code: AUBSCED 803

ICT in Teaching-Learning Process

Course Outcomes:

The students will be able to:

- Understand the concept and role of ICT in construction of Knowledge.
- Acquire knowledge and understanding about National Policy on Education.
- Identify the challenges in integration of ICT in school education.

- Understand computer fundamentals.
- Apply different Hardware Technologies in Modern Educational Practices.
- Familiarize with the new trends in ICT.

Course Code: AUBSCED 804

Health and Physical Education

Course Outcomes:

The students will be able to:

- Understand concept of health, hygiene and health education.
- Differentiate between communicable and non-communicable diseases.
- Develop skills in marking grounds for different games.
- Understand the objectives of school health services.
- Understand the concept and importance of physical education.

Course Code: AUBSCED 805

Guidance & Counseling

Course Outcomes:

The students will be able to:

- Understand the meaning, objectives, need, scope and principles of guidance.
- Develop counseling skills.
- Organize guidance programme in the secondary schools.
- Develop the skills to prepare case study, to diagnose and identify problems, prepare report and provide guidance accordingly.

# M.A. Education

## 1<sup>st</sup> Year Courses

### **Course Code: AUMAEDU101      Philosophical Foundations of Educations**

Course Outcomes:

To enable the learners to:

1. Understand and explain the nature and functions of educational philosophy.
2. Understand the concept and meaning of philosophy and branches of philosophy.
3. Understand and explain six schools of Indian Philosophy.
4. Understand and explain philosophical thoughts of some Indian and western prominent educational thinkers.

### **Course Code: AUMAEDU102      Sociological Foundations of Education**

Course Outcomes:

To enable the learners to:

1. Understand the meaning and nature of educational sociology, sociology of education and social organizations.
2. Understand the social aspects of education.
3. Understand the meaning and concept of social change with special reference to India.
4. Understand the critical note on meaning, nature & determinants of culture and role of education in cultural context.
5. Understand the social interactions and culture.
6. Describe social interaction and their Educational implications.
7. Understand the inequalities, inequities and excellence in education.

### **Course Code: AUMAEDU103      Psychological      Foundations      of      Educations**

Course Outcomes:

To enable the learners to:

1. Develop understanding of the psychological and development basis of education.
2. Understand the concept and different principles of growth and development.
3. Understand the different aspects of development of learner's personality.
4. Understand different theories of development and their educational implications.
5. Understand different dimensions of individual differences
6. Understand the changing concept of intelligence, creativity and its application.
7. Understand different theories of personality.
8. Understand different techniques of assessment of personality.
9. Understand the concept of mental hygiene and health and its importance in their life.

**Course Code: AUMAEDU104      Contemporary Issues in Education**

Course Outcomes:

To enable the learner to:

1. Analyze the historical perspectives of education at different levels.
2. Understand the nature of education as an area of study with multidisciplinary knowledge base.
3. Reflect on the contemporary issues in education.
4. Appreciate that relevant research work would help to achieve efficiency and excellence in the educational practices.

**Course Code: AUMAEDU105      Educational Technology**

Course Outcomes:

To enable the learner to:

1. Understand the nature and scope of educational technology and also about the various forms of technology.
2. Establish relationship between learning theories and educational technology.
3. Know the instructional design and modes of development of self-learning material.
4. Know the different models of teaching.
5. Develop basic skills in the production of different types of instructional material.
6. Know the recent innovation and future perspectives of educational technology.
7. Familiarize with evaluation techniques.



## 2<sup>nd</sup> Year Courses

**Course Code: AUMAEDU201**

**Curriculum Development and Comparative Education**

Course outcomes:

To enable the learner to:

1. Develop an understanding of fundamentals of Curriculum development.
2. Understand the role of Philosophy, Psychology, and Sociology in shaping Curriculum.
3. Develop understanding of System analysis in Curriculum.
4. Develop the process of Curriculum Development.
5. Gain Knowledge and Understanding of various Models of curriculum design.
6. Understand the Evaluation process in Curriculum.
7. Understand the concept, significance and scope of Comparative Education.
8. Acquaint with the various approaches to study of comparative education; and also factors affecting development of education.
9. Comprehend and compare the concept, practice teaching and evaluation system of teacher education on focused countries.
10. Know the recent trends and best practices in education such as distance and open learning, vocational education and educational administration.
11. Understand and reflect on comparison of the educational systems of USA, UK, and India with special reference to Primary Education, Secondary Education and Higher Education.
12. Understand the prevailing problems and issues in education and also know the role of various agencies which acts for the progress of education system.

**Course Code: AUMAEDU202**

**Special Education**

Course outcomes:

To enable the learner to:

1. Know about the meaning and scope of special education in India.
2. Understand the various types of disabilities and making education integrated and inclusive to all in tune with the goal of Universalization of Education.
3. Grasp about the meaning, specific characteristics and modalities of identification of various types of (students who are different than majority or are) exceptional learners.
4. Understand various educational intervention programmes for meeting the needs of exceptional learners.

**Course Code: AUMAEDU203**

**Methods of Data Analysis of Education**

Course outcomes:

To enable the learner to:

1. Understand the nature and types of data and different scales of measurement.
2. Understand the concepts and nature of educational data and data analysis / statistical analysis techniques.
3. Understand and apply various statistical techniques to field-based educational data.
4. Appreciate the role of statistical tools / techniques in analysis of data for educational research.
5. Understand and apply various statistical techniques to field-based educational data.
6. Appreciate the role of statistical tools / techniques in analysis of data for educational research.
7. Make interpretations of findings revealed through statistical data analysis.

Course outcomes:

To enable the learner to:

1. Understand the meaning & Nature of Educational Research.
2. Have insight of types of Educational Research.
3. Understand the foundations of educational research.
4. Develop insight of the types and methods of educational research.
5. Understand the necessity of review of literature.
6. Construct and use different kinds of Tools & techniques of Collecting Data.
7. Formulate and test Hypothesis.
8. Understand about the fundamentals of Sampling theory and technique.
9. Familiarize about various measurement and scaling techniques.



**Masters of Business Administration**

**Course Outcome**

## **Semester-1**

### **MANAGEMENT PRACTICES AND ORGANISATIONAL BEHAVIOUR**

**Course Code: AUMBA-101)**

**COURSE OUTCOMES:** Students will have a better understanding of Management practices in organization. They will know the framework for managing individual and group performance.

### **BUSINESS ENVIRONMENT**

**Course Code: AUMBA-102)**

#### **Course Outcomes**

- Upon successful completion of the course, students will be able to
- Discuss the supply and demand theory and its impact on businesses.
- Explain the effects of government policy on the economic environment and industries.
- Outline how an entity operates in a business environment.
- Describe how financial information is utilized in business.
- Explain the legal framework that regulates the business in general.

### **HUMAN VALUES AND PROFESIONAL & ETHICS**

**Course Code: (AUMBA-103)**

#### **Course Outcomes**

- Learn the moral issues and problems; find the solution to those problems.
- Learn the need for professional ethics, codes of ethics and roles, concept of safety, risk assessment.
- Gain exposure to Environment Ethics; know their responsibilities and rights

### **COMPUTER APPLICATIONS IN BUSINESS**

## **Course Code: AUMBA-104**

### **Course Outcomes**

- Upon successful completion of the course, students will be able to
- Discuss the communication network and networking devices.
- Explain the effects of AI.
- Outline of application and system software.
- Familiarizing the students with IT concepts.
- Explain the use of enterprise systems.

## **FINANCIAL MANAGEMENT**

### **Course Code: AUMBA-105**

### **Course Learning Outcomes:**

- Upon successful completion of the course, the students will be able to
- Understand the concept of Financial Management and various sources of finance.
- Have the knowledge and skills to select and employ base level tools for capital structure using different types of approaches.

## **BUSINESS RESEARCH METHODS**

### **Course Code: AUMBA-106**

### **Course Outcomes**

- Upon successful completion of the course, the students will be able to
- Demonstrate knowledge of research processes (reading, evaluating, and developing)
- Perform literature reviews using print and online resources
- Identify, explain, compare, and prepare the key elements of a research proposal/report
- Define and develop a possible research interest area using specific research designs

# **STRATEGIC MANAGEMENT**

**Course Code: (AUMBA-107**

## **Course Outcomes**

- Upon successful completion of the course, the students will be able to
- Have knowledge about various types of strategies and decisions related to strategic management.
- Understand about various levels of business as well as corporate level strategies.
- Get familiar about the implementation, evaluation and control of strategies.

4. Kark Rajneesh (2008). *Competing with the Best: Strategic Management of Indian Companies in a Globalizing Arena* Penguin Books.

5. AzharKazmi (2009). *Business Policy and Strategic Management*. Tata McGraw Hill, New Delhi

6. Jauch&Glueek(2009) : *Business Policy and Strategic Management*

# **Semester –II**

## **BUSINESS STATISTICS AND COMPUTING SKILLS**

**Course Code :( AUMBA-201)**

### **Course Outcomes:**

- Produce appropriate graphical and numerical descriptive statistics for different types of data.
- Conduct and interpret a variety of hypothesis tests to aid decision making in a business context.
- Use simple/multiple regression models to analyze the underlying relationships between the variables through hypothesis testing.

## **PRODUCTION AND OPERATIONS MANAGEMENT**

**Course Code: (AUMBA-202)**

### **Course Outcomes:**

- Understand the role of operations in both manufacturing and service organizations and the significance of operations strategy in the overall business.
- Understand the importance of facilities location decision in the whole supply chain in globalized operations and learn the tools relating to facilities location.
- Understand different types of production processes and facility layout suitable for manufacturing different categories of products.
- Understand the elemental processes involved in designing a product and a service.



**COMMUNICATION AND MARKETING SKILLS**  
**Course Code:(AUMBA-203)**

**Course Outcomes:**

- Understand the role of communication in personal and professional success.
- Develop awareness of appropriate communication strategies.
- Analyze a variety of communication acts.

**Advanced Financial Management (AUMBAFM-01) (Major)**

**COURSE OUTCOMES:**

- Possess the techniques of managing finance in an organization.

**SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT**

**Course Code :( AUMBAFM-02)**

**MANAGEMENT OF BANKING OPERATIONS (AUMBAFM-03)**

**Course Outcomes:**

- Understand the banking operations in commercial and investment banks.
- Evaluate specific banking functions (i.e., strategic planning, administrative policies, marketing, loans, securities, asset/liability management, funding, and operations.
- Assess the integrated operations of a banking organization, including the activities of trust, information technology, and consumer-related issues.

## **ADVERTISING AND SALES MANAGEMENT**

**Course Code :( AUMBAMK-01)**

### **Course Outcomes**

- Upon successful completion of the course, students will be able to
- Understand the process of advertising communications.
- Acquaint approaches and methods to develop, execute and evaluate advertising campaigns
- Apply Advertising through the development and implementation of an advertising plan

## **CONSUMER BEHAVIOUR**

**Course Code: (AUMBA MK-02)**

**Course outcomes:** The student will understand the influences on customer choice and the process of human decision making in a marketing context.

## **RURAL MARKETING**

**Course Code :( AUMBAMK-03)**

### **Course Outcomes**

- Upon successful completion of the course, students will be able to
- Understand in detail the concept and problems being faced by the rural markets.
- Acquaint various strategies that are specific for rural markets to flourish.
- Develop an insight of role being played by corporate sector in rural marketing.
- Create understanding of other concepts that are related to rural marketing like agriculture and social marketing.

**MANAGEMENT OF INDUSTRIAL RELATIONS**  
**Course Code :( AUMBAHR – 01)**

**Course Outcomes:**

- To understand the Dynamic context of Industrial Relations
- To know the Industrial Bodies and Find out the ways of solving Labor Problems in India

**LABOUR LEGISLATIONS**

**Course Code :( AUMBAHR -02)**

**Course Outcomes**

- Upon successful completion of the course, the students will be able to
- Widen the learning horizons w.r.t. industrial workers and labour welfare; and,
- Sensitize w.r.t. various Acts that are related to the different aspects of labour welfare

**INDUSTRIAL/ORGANIZATIONAL PSYCHOLOGY**

**Course Code :( AUMBAHR -03)**

- **Course Outcomes**
- Upon successful completion of the course, the students will be able to understand the complex dimensions of Industrial Psychology and the uses of test for placement, promotion.

**Relational Database Management System**  
**Course Code :( AUMBA IT-01)**

**Course Outcomes**

1. Describe the fundamental elements of relational database management system.
2. Explain the basic concepts of relational data model, entity relationship model, relational database design, SQL.

**E-COMMERCE & IT ENABLED SERVICES**

**Course Code :( AUMBAIT -02)**

**Course Outcomes**

- Students will be able to identify and apply relevant problem solving methodologies.
- Design components, systems or processes to meet required specifications for a web presence.

**SYSTEM ANALYSIS & DESIGN AND SOFTWARE ENGINEERING**

**Course Code :( AUMBAIT -03)**

**Course Outcomes**

- Describe principles, concepts and practice of System Analysis and Design process.
- Explain the processes of constructing the different types of information systems.
- Design and Development of Information Systems in real world business environment.

**INTERNATIONAL MARKETING**  
**Course Code: (AUMBAIB – 01)**

**Course Outcomes**

- Describe Foreign market entry strategies such as licensing, Joint venture, Franchising, exporting
- Explain the processes of constructing the different types of foreign market entries.

**INTERNATIONAL BUSINESS ENVIRONMENT AND FOREIGN EXCHANGE  
ECONOMICS**

**Course Code :( AUMBAIB – 02)**

**Course Outcomes**

- Explain the processes of constructing the different types of foreign exchange market entries.
1. Maheshwari, S.N.(2009)., Financial Management – Principles & Practice, 13th Edition, Sultan Chand & Sons.
  2. Bhalla V.K (2009). - International Business Environment (Anmol).

**EXPORT MANAGEMENT AND DOCUMENTATION**

**Course Code: (AUMBAIB – 03)**

**Course Outcomes**

- To understand the Benefits arising from Export by using proper Export marketing channels and proper utilizing of various sources of Export Financing.

## **Semester-III**

### **ENTREPRENEURSHIP DEVELOPMENT**

**Course Code:(AUMBA-301)**

#### **Course Learning Outcomes:**

- Explain the meaning and significance of entrepreneurship and understand the process of entrepreneurial action.
- Understand the entrepreneurial mindset and personality.

### **INTERNATIONAL FINANCE& TAX PLANNING**

**Course Code :( AUMBA-302)**

#### **Course Learning Outcomes:**

- Understanding the implications of tax benefits and incentives for corporate decisions in various situations.
- Understanding International Finance and Taxation
- Gain proper knowledge about exchange rates, stock market, derivate markets and GST.

### **SUPPLY CHAIN MANAGEMENT**

**Course Code: (AUMBA-303)**

#### **Course Outcomes**

- Upon successful completion of the course, the students will be able to
- Identify ways to fulfill customer demand through efficient resources
- Describe the process of planning, implementing and controlling the efficient, effective flow and storage of goods, services and related information from point of origin to point of consumption
- Apply principles of effective distribution and optimization of pre & post inventory levels
- Assess the product demand by driving customer value, improving responsiveness, facilitating financial success and building a good network.

## **PRINCIPLES OF INSURANCE AND BANKING**

**Course Code :( AUMBAFM-04)**

### **Course Outcomes**

- At the end of the course students are able to:
- Have knowledge about various types of insurance and its basic principles.
- Understand about various insurance related documents and other attachments associated with insurance.
- Extrapolate the types of operations and its management in banking business.
- Get familiar about recent trends in banking in India.

## **STRATEGIC FINANCIAL MANAGEMENT**

**Course Code: (AUMBAFM-05)**

### **Course Outcomes**

- Upon successful completion of the course, the students will be able to
- Widen the learning horizons w.r.t. crucial components of the financial system; and,
- Sensitize w.r.t. governance and administration issues concerning financial system, focusing on Indian financial system.

## **MANAGEMENT OF FINANCIAL SERVICE**

**Course Code :( AUMBAFM-06)**

### **Course Outcomes**

- Upon successful completion of the course, the students will be able to
- Widen the learning horizons w.r.t. crucial components of the financial system; and,
- Sensitize w.r.t. governance and administration issues concerning financial system, focusing on Indian financial system.

**MARKETING OF SERVICES**  
**Course Code: (AUMBAMK-04)**

**Course Outcomes:**

- Apply principles of effective distribution and optimization of pre & post inventory levels
- Assess the product demand by driving customer value, improving responsiveness, facilitating financial success and building a good network.

**RETAIL MANAGEMENT**  
**Course Code :( AUMBAMK 05)**

**SALES AND DISTRIBUTION MANAGEMENT**

**Course Code:(AUMBAMK-06)**

**Course outcomes:**

- To manage the retail chains and understand the retail customer's behavior and managing the sales forces

**HUMAN RESOURCE PLANNING AND DEVELOPMENT**  
**Course Code:AUMBAHR-04**

**Course outcomes:**

- To manage the HR resources and buildup the challenges and strategies of HRD.



## **TEAM BUILDING & LEADERSHIP**

**Course Code: (HR-05)**

### **Course Outcome**

- It is designed to help any team leader, from a design and put together a winning team to achieve whatever goals it has set. It include vital information such as design and purpose of teams in various real life scenarios, the psychological aspect of the team membership and team building, shaping realistic goals and assessing resources to develop your team, and team building exercises to help you motivate and inspire your team to achieve maximum success.

## **TRAINING AND DEVELOPMENT FOR PERSONAL GROWTH**

**Course Code:(AUMBAHR-06)**

### **Course Outcomes:**

- Use concepts to become self-aware of strengths and discover innate potential which is the source of personal power.
- Learn personality determinants to overcome weakness and foster holistic development that encompasses physical, mental, social and spiritual self.
- Understand training need assessment and its need.
- Become an effective speaker and an active listener.

## **DATA COMMUNICATION & NETWORK**

**Course Code: (AUMBAIT-04)**

### **Course Outcomes**

- Independently understand basic computer network technology.
- Understand and explain Data Communications System and its components.
- Identify the different types of network topologies and protocols.

## **ENTERPRISE RESOURCE PLANNING**

**Course Code :( AUMBAIT-05)**

### **Course Outcomes**

- Identify the important business functions provided by typical business software such as
- Enterprise resource planning and customer relationship management.
- Describe basic concepts of ERP systems for manufacturing or service companies.
- Analyze the technical aspect of telecommunication systems, internet and their roles in
- Business environment.

## **INTERNET AND WEB DESIGNING**

**Course Code:(AUMBAIT-06)**

### **Course Outcomes**

- Analyze a web page and identify its elements and attributes.
- Create web pages using HTML and Cascading Style Sheets.

# Semester-1V

## Course Outcomes:

- Develop economic way of thinking in dealing with practical business..
- Strategic and Innovative Thinking and Analysis Skills to Enable Effective Opportunity Identification, Problem Solving, and Decision-Making.
- Industrial training will help you to enhance your skills and gain knowledge about your technical and interest field.
- The industrial training targets on several critical points in the working environment. It will help you to learn professionalism

## B.A. B.Ed. (Courses Outcomes)

### Semester-1<sup>st</sup>

Course Code: AUBAED 101

General Hindi

Course Outcomes:

- छात्रों में भाषा को समझने तथा मूल्यांकन करने की दृष्टि बढ़ाना
- शब्द संरचना प्रक्रिया के प्रति छात्रों का ध्यानाकर्षण कराना
- छात्रों को प्रयोजनमूलक हिन्दी की व्यापकता से अवगत करवाना
- हिन्दी भाषा की व्यावहारिक उपयोगिता का परिचय देना

Course Code: AUBAED 102

Introduction of Political Theory

Course Outcomes:

- Understand the main concepts and debates in classical and contemporary political theory.
- Critically read and analyse classical and contemporary texts on political theory.
- Illustrate and evaluate the development of concepts and theories throughout the history of Western political thought.
- Explain the relationship between political theory and other disciplines (e.g. political science);
- Apply philosophical concepts in order to understand and critically assess real-world political phenomena.

Course Code: AUBAED 103

Ancient History Earliest to 300 C

Course Outcomes:

- Students will understand the chronology of Ancient India.
- It will provide knowledge of development and the various achievement of man in Stone Age. It will through a deep light on the different aspects of Harappan civilization.
- It will motivate them to study the religious, spiritual texts of ancient India.
- Students will know about the different aspects of Indian history under various dynasties.
- It will help them to know about the emergence and philosophy of Jainism and Buddhism.
- It will also provide the idea about art and architecture of ancient India.

Course Code: AUBAED 104

Introduction of Sociology

Course Outcomes:

- Student will be able to explain social facts and society related concepts.
- Student will be able to define and explain sociological concepts.
- Student will be able to define and exemplify social fact.
- Student will be able to express empirical observations with sociological concepts.
- Student will be able to convey the historical development of sociology.

- Student explains the sociological theories in classic, modern and post modern eras.
- Student relates the development of sociology to social change.
- Student conveys the latest developments in sociology.

## Semester-2<sup>nd</sup>

Course Code: AUBAED 201

Environmental Studies

Course Outcomes:

- To create awareness among students about environment protection. Course Outcomes
- Based on this course, the students will understand / evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn help in sustainable development.

Course Code: AUBAED 202

Computer Fundamentals, Internet & MS-Office

Course Outcomes:

After studying this course, the students will be able to:

- Understand the fundamental hardware components that make up a computer's hardware and the role of each of these components.
- Understand the difference between an operating system and an application program, and what each is used for in a computer.
- Describe some examples of computers and state the effect that the use of computer technology has had on some common products.
- Be familiar with software application.
- Understand file management.

Course Code: AUBAED 203

Indian Government and Politics

Course Outcomes:

- Introducing the Indian Constitution with a focus on the role of the Constituent Assembly and examining the essence of the Preamble.
- Examining the Fundamental Rights and Duties of Indian citizens with a study of the significance and status of Directive Principles.
- Assessing the nature of Indian Federalism with focus on Union-State Relations.
- Critically analyzing the important institutions of the Indian Union: the Executive: President; Prime Minister, Council of Ministers; Governor, Chief Minister and Council of Ministers; The legislature: Rajya Sabha, Lok Sabha, Speaker, Committee System, State Legislature, The Judiciary: Supreme Court and the High Courts: composition and functions- Judicial Activism

Course Code: AUBAED 204

Medieval History from 300 to 1206 AC

Course Outcomes:

- This course helps them to construct the idea about the Guptas, their rulers and administration. Students will be able to know about the various historical writings of ancient India.

- It will help them to examine the political structure of ancient India and the emergence of various regional powers.
- It will help them to understand the growth of Buddhism.
- Knowledge about the various changes in society, economy, and culture in ancient India.
- Different opinion about the origin of Rajputas and the Arab invaders.
- It will also help them to know about various types coins during the Gupta age.

Course Code: AUBAED 205

Society in India

Course Outcomes:

This course seeks to introduce the students to the study of Indian politics from a sociological Perspective. In the process, it attempts to give the students theories, categories and conceptual tools to understand politics in relation to society in general.

### **Semester-3<sup>rd</sup>**

Course Code: AUBAED 301

Childhood and Development Years

Course Outcomes:

- Understand the meaning, nature and scope of educational psychology.
- Understand growth and development of the learner and its importance in the learning process.
- Understand the need and problems of adolescence.
- Identify educational needs of various types of children
- Understand concept of intelligence and personality, theories of intelligence and personality and their educational implications

Course Code: AUBAED 302

Understanding Disciplines and Subjects

Course Outcomes:

- Understand the nature of discipline and school subjects.
- Differentiate between school subjects and curriculum.
- Integrate and apply concepts and theories in real classrooms

Course Code: AUBAED 303

Language Across the Curriculum

Course Outcomes:

- Understand the nature, importance and use of Language.
- Acquaint with some latest methods and approaches for planning of successful language teaching.
- Identify and be sensitive to the proficiency, interests and needs of learners.
- Practice learner centered methods and techniques in the classroom.
- Use technology to enrich language teaching,
- Encourage continuous professional development.

Course Code: AUBAED 304

English

Course Outcomes:

- Students will strengthen their ability to write academic papers, essays and summaries using the process approach.
- To recognize poetry from a variety of cultures, languages and historic periods.
- To understand and appreciate poetry as a literary art form.
- To analyze the various elements of poetry, such as diction, tone, form, genre, imagery, figures of speech, symbolism, theme, etc.

Course Code: AUBAED 305 (i) Comparative Government and Politics  
(ii) Introduction to International relations

Course Outcomes:

- Tracing the evolution of Comparative Politics as a discipline and drawing a distinction between Comparative Politics and Comparative Government.
- Investigating the nature and scope of Comparative Politics.
- Analysing the approaches the approaches and models of comparison: systems analysis; structural functionalism; and institutional approach.
- Explaining scope and subject matter of International Relations as an autonomous academic discipline.
- Approaches and methods to study the discipline through Political realism, Pluralism and Worlds system's Model.
- Examining the issues of Underdevelopment, Terrorism, Regionalism and Integration that characterizes the Post second world war order.

Course Code: AUBAED 306 History of India from 1206 to 1707 AD

Course Outcomes:

- Students will be able to know about the establishment of Delhi sultanate.
- Philosophy of Bhakti and Sufi movements.
- Foundation and expansion and consolidation of Mughal Empire and decline of Mughal Empire.
- It will help them to know about the art and architecture of medieval India.
- They will be able to identify the various causes of rising of Maratha and Sikh Power.

Course Code: AUBAED 307 Sociological Theories

Course Outcomes:

The present course introduces the students to the classical sociological thinkers, whose work has shaped the discipline of sociology. Acquaintance with the writing of three thinkers (Auguste Comte, Karl Marx, Max Weber, Emile Durkheim) would equip the students with theoretical insights to know, analyze and interpret the social scenario around them and would also familiarize them with the different sociological perspectives and theories.

## Semester-4<sup>th</sup>

Course Code: AUBAED 401 Learning and Teaching

Course Outcomes:

The students will be able to:

- Understand the nature, characteristics of learner and principles to make teaching-learning effective and productive.
- Explain the concept, nature of learning as a process and conditions of learning.

- Describe the Gagne's types of learning.
- Explain the concept, types and strategies to develop memory.
- Understand nature, causes, factors and strategies to minimize forgetting.
- Apply the knowledge and understanding of the learning process, principles and theories of learning with their educational Implications.
- Describe the concept, Importance and level of transfer of learning.

Course Code: AUBAED 402                      Drama and Art in Education

Course Outcomes:

The students will be able to:

- Understand the concept and importance of various arts in human life.
- Understand aims, objectives and principles of performing and visual arts.
- Appreciate Indian folk and visual and performing arts.
- Understand various methods and techniques of teaching creative arts.
- Understand the importance of visits in arts exhibitions and cultural festivals.

Course Code: AUBAED 403                      Text Reading and Reflections

Course Outcomes:

The students will be able to:

- Learn to read Newspaper Follow Radio, TV & Internet media critically and with understanding.
- Form and exchange viewpoints on political and social Issues.
- Distinguish fact, fiction and opinion in Newspaper articles.
- Develop teachers professionally and support their aspirations as teachers.

Course Code: AUBAED 404                      English

Course Outcomes:

The students will be able to:

- Read and comprehend better.
- Communicate in English orally and in writing.
- Participate in role plays and mini-talks.
- Refer to the dictionary for synonymous expressions and grammar.

Course Code: AUBAED 405 (i) Legislative Support (ii) Public Opinion & Survey Research

Course Outcomes:

To acquaint the student broadly with the legislative process in India at various levels, introduce them to the requirements of peoples' representatives and provide elementary skills to be part of a legislative support team. This course will introduce the students to the debates, principles and practices of public opinion polling in the context of democracies, with special reference to India. It will familiarise the students with how to conceptualize and measure public opinion using quantitative methods, with particular attention being paid to developing basic skills pertaining to the collection, analysis and utilisation of quantitative data.

Course Code: AUBAED 406                      History of India 1707 to 1950 AD



Course Outcomes:

- To understand modern India.
- Students from history stream will get knowledge about the penetration, expansion and consolidation of British Rule in India.
- Indian awakening, cultural changes and socio- religious reforms movements, Revolt of 1857
- They will acquire knowledge about communal politics, partition in India and aftermath of Indian states and also how India became the republic nation.

Course Code: AUBAED 407                      Methods of Sociological Enquiry

Course Outcomes:

The course is a general introduction to the methodologies of sociological research methods. It will provide the student with some elementary knowledge of the complexities and philosophical underpinnings of research.

## **Semester-5<sup>th</sup>**

Course Code: AUBAED 501                      Assessment for Learning

Course Outcomes:

The students will be able to;

- Understand the nature of assessment and its role in teaching-learning process.
- Understand the different perspectives of learning on assessment.
- Realize the need for school-based assessment in schools.
- Examine the contextual roles of different forms of assessment.
- Understand the different dimensions of learning and the related assessment procedures, tools and techniques

Course Code: AUBAED 502                      Gender, School and Society

Course Outcomes:

The students will be able to:

- Develop basic understanding and familiarity with key concepts: Gender bias, gender stereotype, empowerment, equity and equality, patriarchy, matriarchy, masculinity and feminism.
- Understand some important landmarks in connection with gender and education in the historical and contemporary perspective.
- Learn about gender issues in school curriculum, textual materials across discipline, pedagogical processes and its interaction with class, caste, religion and region.

Course Code: AUBAED 503                      Inclusive School

Course Outcomes:

The students will be able to:

- Understand the concept, nature and types of disabilities.
- Identify the characteristics and need, identification of different types of disabled children. Understand the concept, nature and approaches of inclusion in education.
- Understand and reflect on models of inclusion in education.
- Acquire knowledge and understanding about the provisions made for disabled children under SSA and RTE Act, 20096.

- Understand different pedagogical and assessment techniques for inclusion of CWSN.
- Employ different pedagogical approaches for inclusion of CWSN in regular schools.

Course Code: AUBAED 504                      English

Course Outcomes:

- To know the beauty of the coherence of Language and Literature
- To demonstrate the awareness of evolution theory of language by varied culture
- To study the formation of new words
- To explore literary elements

Course Code: AUBAED 505                      Democratic Awareness with Legal Literacy

Course Outcomes:

The student should be aware of the institutions that comprise the legal system - the courts, police, jails and the system of criminal justice administration. Have a brief knowledge of the Constitution and laws of India, an understanding of the formal and alternate dispute redressal (ADR) mechanisms that exist in India, public interest litigation. Have some working knowledge of how to affirm one's rights and be aware of one's duties within the legal framework; and the opportunities and challenges posed by the legal system for different sections of persons.

Course Code: AUBAED 506                      Modern and Contemporary World History 1: 1871-1919

Course Outcomes:

The students will be able to understand:

- To acquaint students with the past and present of India and the World.
- Impart a critical understanding of Indian society, economy, polity, and culture through a historical perspective.
- To prepare students for a range of careers.
- To stimulate intellectual curiosity and research attitude in the students.
- To have some knowledge and understanding of historical development in the wider world.
- The processing of semiconductor devices like 1D, 2D & 3D photonic crystals.

Course Code: AUBAED 507                      Marriage, Family and Kinship

Course Outcomes:

This course aims to highlight and critically examine contemporary concerns in the fields of marriage, family and kinship. It considers theoretical issues and ethnographies with particular emphasis on diversity of practices.

## **Semester-6<sup>th</sup>**

Course Code: AUBAED 601                      Contemporary India & Education

Course Outcomes:

The students will be able to:

- Understand the Constitutional Provisions for Education in India.

- Understand the Fundamental Rights, Duties and Directive Principles of the State Policy.
- Develop competencies to understand the various issues related to Education and remedial measures.
- Understand the Constitutional provisions for inequality, discrimination and marginalization in UEE.
- Understand the importance of Education for the marginalized groups.
- Acquaint with the policy initiatives, educational policies and programme in Contemporary India.

Course Code: AUBAED 602                      Teaching of Social Sciences

Course Outcomes:

The students will be able to:

- Understand meaning, nature and scope of social sciences.
- Understand the need and importance of teaching social sciences and relationship of social sciences with other subjects of school curriculum.
- Understand aims and objectives of teaching social sciences at school stage.
- Acquaint with different approaches of teaching social sciences at school stage.
- Select and use appropriate methods and approaches of teaching social sciences.

Course Code: AUBAED 603 (i)                      Teaching of English

Course Outcomes:

The students will be able to:

- Understand the nature, importance and use of English language.
- Identify the proficiency, interests and needs of learners.
- Understand methods and approaches of Teaching English Language.
- Develop language skills: listening, speaking, writing and reading for Communication purpose

Course Code: AUBAED 603(ii)                      Teaching of Hindi

Course Outcomes:

Paper code AUBAED- 603 (ii) TEACHING OF HINDI

( हिंदी शिक्षण) पाठ्यक्रम संप्राप्ति: पाठ्यक्रम के अंत में छात्र निम्नलिखित उद्देश्यों को प्राप्त करने में सक्षम होंगे: 1. भाषा का अर्थ, प्रकृति एवं महत्व 2. भाषा की अलग-अलग भूमिका को जानना 3. भाषा के विभिन्न रूपों एवं अभी व्यक्तियों को जानना 4. मातृभाषा, क्षेत्रीय भाषा व विदेशी भाषा के रूप में हिंदी को पहचानने में 5. हिंदी शिक्षण में गद्य पद्य रचना एवं व्याकरण के चरणों एवं उद्देश्यों ज्ञान प्राप्त करने ।

Course Code: AUBAED 604                      English

Course Outcomes:

- To learn the use rather than usage of English
- To develop their critical thinking capabilities focused through the course as an important need.



( हिंदी शिक्षण) पाठ्यक्रम संप्राप्ति: पाठ्यक्रम के अंत में छात्र निम्नलिखित उद्देश्यों को प्राप्त करने में सक्षम होंगे:

1. हिंदी शिक्षण में गद्य पद्य रचना एवं व्याकरण के चरणों एवं उद्देश्यों का ज्ञान
2. हिंदी भाषा में मूल्यांकन संबंधित क्षमता प्राप्त करते हुए प्रश्न पत्र का निर्माण।
3. विद्यार्थियों की सृजनात्मक क्षमता को पहचानना
4. हिंदी शिक्षण में भाषा कौशल से संबंधित कौशल का विकास

## Semester-8<sup>th</sup>

Course Code: AUBAED 801 Knowledge and Curriculum

Course Outcomes:

The students will be able to:

- Understand the meaning and principles of curriculum.
- Understand and appreciate curriculum as a means of development of the individual.
- Understand the foundations and evaluation of curriculum.
- Comprehend the different models of curriculum compare the view point given by different commissions.
- Develop an understanding of the concept, need, scope and functions of school management. Develop an understanding of different components of human and material resources of the school.

Course Code: AUBAED 802 Understanding the Self

Course Outcomes:

The students will be able to:

- Understand self-concept and its importance in human life.
- Understand self-confidence and its importance in human life.
- Understand the nature, classification, sources, and methods of inculcation of human values. Understand the role of different agencies in promotion of human values.
- Define philosophy of yoga.
- Explain the psychological and physiological basis of yoga.

Course Code: AUBAED 803 ICT in Teaching-Learning Process

Course Outcomes:

The students will be able to:

- Understand the concept and role of ICT in construction of Knowledge.
- Acquire knowledge and understanding about National Policy on Education.
- Identify the challenges in integration of ICT in school education.
- Understand computer fundamentals.
- Apply different Hardware Technologies in Modern Educational Practices.
- Familiarize with the new trends in ICT.

Course Code: AUBAED 804 Health and Physical Education

Course Outcomes:

The students will be able to:

- Understand concept of health, hygiene and health education.
- Differentiate between communicable and non-communicable diseases.

- Develop skills in marking grounds for different games.
- Understand the objectives of school health services.
- Understand the concept and importance of physical education.

Course Code: AUBAED 805

Guidance & Counseling

Course Outcomes:

The students will be able to:

- Understand the meaning, objectives, need, scope and principles of guidance.
- Develop counseling skills.
- Organize guidance programme in the secondary schools.
- Develop the skills to prepare case study, to diagnose and identify problems, prepare report and provide guidance accordingly.

## M.A. Economics

### Course Outcomes

#### **AUMAECO-101-Microeconomics**

- Introduce tools and methods of economic analysis that will serve as the basis for other courses in economics such as Macroeconomics, Economic Analysis, Managerial Economics, and Economic Resources.
- Provide non-specialists economics student with a good introduction to the fundamental principles of microeconomics.
- Familiarize students to use the concepts to which they are introduced to facilitate analysis of the functioning of the micro economy.
- This course provides students with the foundation theories of basic microeconomics including an introduction into the study of economics and analyses of economic agents' behaviours, particularly that of the individual and the firm.

AUMAECO-102-International Economics

AUMAECO-103-Elementary Mathematical Economics

AUMAECO-104-Macro Economics

AUMAECO-105-Money and Banking

AUMAECO-106-Business Statistics

AUMAECO -107-Economics of Development and Planning

AUMAECO -108-History of Economic Thought

AUMAECO -109\*-Agriculture Economics

AUMAECO -110\*-Regional Economics

AUMAECO -111\*-Economics of Population

AUMAECO -112\*- Basics of Econometrics

AUMAECO -113

AUMAECO -114

AUMAECO -115\*

AUMAECO -116\*

AUMAECO -117\*

**M-TECH COMPUTER SCIENCE ENGINEERING SYLLABUS OUTCOMES AND OBJECTIVES**

SUBJECT CODE	SUBJECT NAME	OBJECTIVES	OUTCOMES
<b>1<sup>ST</sup> SEMESTER</b>			
<b>AUMTCSE-101</b>	<b>Big Data Analytics</b>	<ul style="list-style-type: none"> <li>• To provide an overview of an exciting growing field of big data analytics.</li> <li>• To introduce the tools required to manage and analyze big data like Hadoop, NoSQL, Map Reduce.</li> <li>• To teach the fundamental techniques and principles in achieving big data analytics with scalability and streaming capability.</li> </ul> <p>To enable students to have skills that will help them to solve complex real-world problems in for decision support.</p>	<ul style="list-style-type: none"> <li>• Understand the key issues in big data management and its associated applications in intelligent business and scientific computing.</li> <li>• Acquire fundamental enabling techniques and scalable algorithms like Hadoop, Map Reduce and NO SQL in big data analytics.</li> <li>• Interpret business models and scientific computing paradigms, and apply software tools for big data analytics.</li> </ul>
<b>AUMTCE/ME/CSE-102</b>	<b>Research Methodology</b>	<ul style="list-style-type: none"> <li>• The method is supported by powerful optimization and numerical techniques, which allow us to work with bodies of complex initial design and with very fine finite-element meshes, giving thus quite accurate solutions even in "difficult" parts and for complex geometries.</li> </ul>	<ul style="list-style-type: none"> <li>• Able to apply the knowledge of sampling data &amp; conducting various analysis.</li> </ul>
<b>AUMTCSE-103</b>	<b>Data Structure &amp; Algorithm Analysis in C</b>	<ul style="list-style-type: none"> <li>• To teach various storage mechanisms of data.</li> <li>• To design and implement various data structures.</li> <li>• To introduce various techniques for representation of the data in the real world.</li> </ul>	<ul style="list-style-type: none"> <li>• Students will be able to implement various linear and nonlinear data structures.</li> <li>• Able to apply the knowledge of sampling data in conducting various surveys and analysis.</li> </ul>



			Students will be able to select appropriate sorting technique for given problem.
<b>AUMTCSE-104(A)</b>	<b>Software Engineering</b>	<ul style="list-style-type: none"> <li>• To provide the knowledge of software engineering discipline.</li> <li>• To apply analysis, design and testing principles to software project development.</li> <li>• To demonstrate and evaluate real time projects with respect to software engineering principles.</li> </ul>	<ul style="list-style-type: none"> <li>• Understand and demonstrate basic knowledge in software engineering.</li> <li>• Identify requirements, analyze and prepare models.</li> <li>• Identify risks, manage the change to assure quality in software projects.</li> </ul>
<b>AUMTCSE-104(B)</b>	<b>Advanced Software Engineering Concepts</b>	<ul style="list-style-type: none"> <li>• To demonstrate and evaluate real time projects with respect to software engineering principles.</li> <li>• To specify, abstract, verify and validate solutions to large-size problems, to plan, develop and manage large software and learn emerging trends in software engineering.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify and apply the principles, processes and main knowledge areas for Software Project Management.</li> <li>• Apply testing principles on software project and understand the maintenance concepts.</li> </ul>
<b>2<sup>ND</sup> SEMESTER</b>			
<b>AUMTCSE-201</b>	<b>Object Oriented Programming with JAVA</b>	<ul style="list-style-type: none"> <li>• To program using C++ features such as composition of objects, Operator overloading, inheritance, Polymorphism etc.</li> <li>• To understand the concept of object oriented programming, java elements.</li> </ul>	<ul style="list-style-type: none"> <li>• Be able to understand the difference between object oriented programming and procedural oriented language and data types in C++.</li> <li>• Be able to program using C++ features such as composition of objects, Operator overloading,</li> </ul>

			inheritance, Polymorphism etc.
<b>AUMTCSE-202</b>	<b>Computer Networks</b>	<ul style="list-style-type: none"> <li>• To get a basic introduction to key concepts and techniques underlying cellular communication and medium access control in wireless networks.</li> <li>• To learn the architecture and issues related to IEEE 802.11 wireless LAN.</li> <li>• To expose the students to various internetworking, routing and multicasting issues and protocols.</li> </ul>	<ul style="list-style-type: none"> <li>• Grasp the concepts and characteristics of wireless signals and transmission channels.</li> <li>• Identify and understand the various design issues of internetworking, routing and multicasting.</li> </ul>
<b>AUMTCSE-203</b>	<b>Distributed Data Base Management System</b>	<ul style="list-style-type: none"> <li>• To learn Distributed Database Management Systems (DDBMSs) features such as concurrency control, recovery control, transactional models, and query processing.</li> <li>• To learn advanced topics of databases like object-oriented, parallel and distributed databases.</li> <li>• To implement the concepts of decision-support models in various database applications</li> </ul>	<ul style="list-style-type: none"> <li>• Analyze the advanced concepts along with their application areas.</li> <li>• Design recovery protocols for distributed databases and parallel database architectures.</li> </ul>
<b>AUMTCSE-204(A)</b>	<b>Software Quality and Testing</b>	<ul style="list-style-type: none"> <li>• To provide the students with theoretical knowledge about concepts of software quality, about the quality models, standards and – methodologies used in software industry.</li> <li>• Understanding and usage of the theory is consolidated by the case studies and exercises.</li> <li>• To understand software and functional testing.</li> </ul>	<ul style="list-style-type: none"> <li>• To develop ability to analyze the relations among software product, process and project in quality assurance and management.</li> <li>• To understand the relationships between software process improvement and software quality management.</li> </ul>
<b>AUMTCSE-204(B)</b>	<b>Computer Architecture and Parallel Processing</b>	<ul style="list-style-type: none"> <li>• To provide students with a broad understanding of computer architecture.</li> </ul>	<ul style="list-style-type: none"> <li>• Understand the advanced concepts of computer</li> </ul>

		<ul style="list-style-type: none"> <li>To study architectures exploiting instruction-level parallelism (ILP), and multiprocessors and minicomputers.</li> <li>To provide exposure to current and emerging trends in Computer Architectures.</li> </ul>	<p>architecture.</p> <ul style="list-style-type: none"> <li>Investigate modern design structures of Pipelined and Multiprocessors systems.</li> <li>Understand the interaction amongst architecture, applications and technology.</li> </ul>
<b>3<sup>RD</sup> SEMESTER</b>			
<b>AUMTCSE-301</b>	<b>Artificial Intelligence &amp; Expert System</b>	<ul style="list-style-type: none"> <li>To understand the concept of AI and Expert Systems.</li> <li>To understand the insight of natural language processing.</li> </ul>	<ul style="list-style-type: none"> <li>Be able to understand the concept of AI, Expert Systems and NLP.</li> <li>Be able to use propositional logic and pragmatic processing.</li> </ul>
<b>AUMTCSE-302</b>	<b>Operating System and Case Study</b>	<ul style="list-style-type: none"> <li>To introduce advanced operating system concepts with emphasis on foundations &amp; design principles.</li> <li>Different components of operating system are covered.</li> </ul>	<ul style="list-style-type: none"> <li>Able to analyze the structure of operating systems and evaluate the relationship between the application programs that work on them.</li> <li>Able to review the state of art in operating systems design.</li> </ul>
<b>AUMTCSE-303</b>	<b>Data Warehousing and Data Mining</b>	<ul style="list-style-type: none"> <li>Compare and contrast different conceptions of data mining as evidenced in both research and application.</li> <li>Describe how to extend a relational system to find patterns using association rules.</li> <li>Evaluate methodological issues underlying the effective application of data mining.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate the knowledge gained through solving problems.</li> <li>Use of data mining tools during Projects to build reliable products, the current demand of the industry.</li> </ul>
<b>AUMTCSE-304(A)</b>	<b>Cloud Computing</b>	<ul style="list-style-type: none"> <li>An overview of the concepts, processes, and best practices needed to successfully secure</li> </ul>	<ul style="list-style-type: none"> <li>Identify security aspects of each cloud model.</li> </ul>

		<p>information within Cloud infrastructures.</p> <ul style="list-style-type: none"> <li>To learn the basic Cloud types and delivery models and develop an understanding of the risk and compliance responsibilities and Challenges for each Cloud type and service delivery model.</li> </ul>	<ul style="list-style-type: none"> <li>Develop a risk-management strategy for moving to the Cloud.</li> <li>Implement a public cloud instance using a public cloud service provider.</li> </ul>
<b>AUMTCSE-304(B)</b>	<b>Cyber Law</b>	<ul style="list-style-type: none"> <li>Examine how the online world has borne new crimes and law enforcement response.</li> <li>Gain insights to application of IT Laws for different types of cyber-crimes.</li> </ul>	<ul style="list-style-type: none"> <li>Analyze various types of cyber-crime and formulate real world cyber-crime investigations.</li> <li>Ability to find solutions in cyber-crime investigations, evidence and applicable law for real world case studies.</li> </ul>
<b>AUMTCSE-305</b>	<b>Pre Thesis</b>	<ul style="list-style-type: none"> <li>To provide basic knowledge of thesis work to the students</li> </ul>	<ul style="list-style-type: none"> <li>Able to apply various methodologies, strategies related to thesis</li> </ul>
<b>4TH SEMESTER</b>			
<b>AUMTCSE-401</b>	<b>Thesis /Dissertation</b>	<ul style="list-style-type: none"> <li>To provide brief knowledge of thesis work to the students</li> </ul>	<ul style="list-style-type: none"> <li>Able to apply various methodologies, strategies related to thesis</li> <li>Able to summarize and analyze the data collected</li> </ul>

## **(PO): Programme Outcomes of the Department of Pharmaceutical Sciences**

**Department of Pharmaceutical Sciences** currently offers:

- A two year, master in Pharmacy (M.Pharm) degree program in Pharmaceutics
- A two year, master in Pharmacy (M.Pharm) degree program in Pharmacology
- A Ph.D. degree in Pharmaceutical Sciences

The Department of Pharmaceutical Sciences (DPS) offers students two degree tracks: M. Pharm and Ph.D. Upon post graduation, the Ph.D. degree will provide them knowledge and tools necessary to become independent researchers, and also the passion and enthusiasm to make impactful contributions to the pharmaceutical sciences field through their career.

### **Master of Pharmacy (M.Pharm) in Pharmaceutics**

M.Pharm. in Pharmaceutics is a 2-year, year dissertation-based program for students who are engrossed in development and formulation of new drugs and therapies. The Master of Pharmacy in Pharmaceutics includes research related to drug delivery, molecular pharmaceutics, nanoformulations and the regulatory affairs pertaining to the pharmaceutical industry. This program has a structure to sustain the students in the field of academia, pharmaceutical industry and also to opt for higher education. This postgraduate course will provide the experimental skills, knowledge, logical thinking to conduct and interpret the experimental data of pharmaceutical experiments.

### **Master of Pharmacy (M.Pharm) in Pharmacology**

M.Pharm. in Pharmacology is a 2-year, year dissertation-based program for students who are interested to study the fundamental principles of pharmacology, mechanisms of drug action and current topics in drug discovery. Students will be trained in basic biochemical, cellular and molecular techniques. This program prepares student lifelong expert with the knowledge in pharmacological and toxicological research, in pharmaceutical and biotechnology industries as well as in research laboratories.

### **Doctor of Philosophy (Ph.D.) in Pharmaceutical Sciences**

This program provides Ph.D. in the Pharmaceutical Sciences Pharmacology and Pharmaceutics. It is aimed at students with M.Pharm or M.S.(Pharm) Degrees. Studies conclude with the award of a Doctor of Philosophy (Ph.D.) in Pharmaceutical Sciences, with an emphasis on research in formulations development and their pharmacological activities in metabolic disorders, rheumatoid arthritis and cancer as well as other diseases. Students are trained for excellent positions in academia, research, education, government, and pharmaceutical industry. The Ph.D. program is intended to foster student development as critical thinkers, skilled researchers and honed for leadership roles.

**(C) Course Outcomes:**

**DRUG DELIVERY SYSTEMS (MPH102T):** This course will provide the knowledge on the area of advances in novel drug delivery systems. Student shall be able to understand the various approaches for development of novel drug delivery systems, criteria for selection of drugs and polymers for the development of formulation and evaluation.

**MODERN PHARMACEUTICS (MPH 103T):** This course is designed to impart advanced knowledge and skills required to learn various aspects and concepts at pharmaceutical industries. Student shall be able to understand the elements of preformulation studies and Generic drug. They will also gain the knowledge about the product development, industrial management and packaging of dosage forms.

**REGULATORY AFFAIRS (MPH 104T):** Students will gain the advance knowledge and skills required to learn the concept of generic drug and their development, various regulatory filings in different countries, different phases of clinical trials and submitting regulatory documents.

**MOLECULAR PHARMACEUTICS (NANO TECHNOLOGY & TARGETED DDS) (NTDS) (MPH 201T):** Student shall be able to understand the advances in novel drug delivery. It would also help them to know what are the selection criteria for drugs and polymers in development of NTDS systems.

**ADVANCED BIOPHARMACEUTICS & PHARMACOKINETICS (MPH 202T):** Students shall be gain the knowledge and skills necessary for dose calculations, dose adjustments and to apply biopharmaceutics theories in practical problem solving.

**COMPUTER AIDED DRUG DELIVERY SYSTEMS (MPH 203T):** Student shall be able to learn the knowledge and skills necessary for computer applications in entire drug research and development process. This course would also help them to clarify the concepts.

**COSMETICS AND COSMECEUTICALS (MPH 204T):** This course is designed to impart knowledge and skills necessary for the fundamental need for cosmetic and cosmeceutical products. Students shall be able to understand the key ingredients used in cosmetics and cosmeceuticals, current technologies in the market.

**MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUE (MPL and MPH101T):** Student shall be able to learn the various advanced analytical instrumental techniques for identification, characterization and quantification of drugs.

**ADVANCED PHARMACOLOGY - I (MPL 102T):** Students shall be gain the basic knowledge in the field of pharmacology and to impart recent advances in the drugs used for the treatment of various diseases. In addition, it will help the students to understand the concepts of drug action and mechanisms involved.

**PHARMACOLOGICAL AND TOXICOLOGICAL SCREENING METHODS - I (MPL 103T):** Students will gain the knowledge on preclinical evaluation of drugs and recent experimental

techniques and models used in the drug discovery and development. It also provides basic to understand the maintenance of laboratory animals as per the guidelines, various in-vitro and in-vivo preclinical evaluation processes.

**CELLULAR AND MOLECULAR PHARMACOLOGY (MPL 104T):** Students will expand the fundamental knowledge on the structure and functions of cellular components and it will further help the student to apply the knowledge in drug discovery process.

**ADVANCED PHARMACOLOGY - II (MPL 201T):** Students will understand the mechanism of drug actions at cellular and molecular level including the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases.

**PHARMACOLOGICAL AND TOXICOLOGICAL SCREENING METHODS-II (MPL 202T):** This subject imparts knowledge on the preclinical safety and toxicological evaluation of drug & new chemical entity. This knowledge will make the student competent in regulatory toxicological evaluation

**PRINCIPLES OF DRUG DISCOVERY (MPL 203T):** The students will learn basic knowledge of drug discovery process. This information will make the student competent in drug discovery process.

**CLINICAL RESEARCH AND PHARMACOVIGILANCE (MPL 204T):** This course will provide a value addition and current requirement for the students in clinical research and pharmacovigilance. It will teach the students on conceptualizing, designing, conducting, managing and reporting of clinical trials.

**MPL-301T & MPH - 301T (RESEARCH METHODOLOGY AND BIOSTATISTICS):** Students will learn the fundamental methodology to carry out experimental design and research. They will also learn the different statistical methods to interpret the experimental data.

#### **Program Specific Outcomes (PSOs):**

1. Our Post Graduate and Doctoral scholars would be compassionate, skilled, and ethical professionals and researchers committed to the cause of health and wellness.
2. Capable of new knowledge and mechanistic approach to the effects of chemical and biological entities and innovative formulations as applied to human health, while displaying leadership and professionalism.

**Study & Evaluation Scheme**

**Of**

**PGDCA**

**[Applicable w.e.f. Academic Year 2019-20]**



**ABHILASHI UNIVERSITY**

**Chailchowk (Chachyot), Distt. Mandi (H.P.)**

**Website: [www.abhilashiuniversity.in](http://www.abhilashiuniversity.in)**



**Study & Evaluation Scheme Programme: PGDCA**

**SEMESTER-I**

Sr.No.	Course Code	Subject	Teaching Scheme				Evaluation Scheme		
			L	T	P/D	Credits	Internal Assessment	External Assessment	Total
1	AUPGDCA - 101	Fundamentals of Programming using C	3	1	0	4	40	60	100
2	AUPGDCA - 102	PC Software	3	1	0	4	40	60	100
3	AUPGDCA - 103	Operating System	3	1	0	4	40	60	100
4	AUPGDCA - 104	Computer Organization and Architecture	3	1	0	4	40	60	100
<b>LABS</b>									
1	AUPGDCA - 101(L)	Fundamentals of Programming using C	0	0	2	1	30	20	50
2	AUPGDCA - 102(L)	PC Software	0	0	2	1	30	20	50
<b>TOTAL</b>			<b>12</b>	<b>4</b>	<b>4</b>	<b>18</b>			

## SEMESTER-II

Sr.No.	Course Code	Subject	Teaching Scheme				Evaluation Scheme		
			L	T	P/D	Credits	Internal Assessment	External Assessment	Total
1	AUPGDCA - 201	Data and File Structure	3	1	0	4	40	60	100
2	AUPGDCA - 202	System Analysis and Design	3	1	0	4	40	60	100
3	AUPGDCA - 203	Object Oriented Programming & C++	3	1	0	4	40	60	100
4	AUPGDCA - 204	Database Management System	3	1	0	4	40	60	100
<b>LABS</b>									
1	AUPGDCA - 203(L)	DFS using C++	0	0	2	1	30	20	50
2	AUPGDCA - 204(L)	Database Management System	0	0	2	1	30	20	50
3		Project Work					100	100	200
<b>TOTAL</b>			<b>12</b>	<b>4</b>	<b>4</b>	<b>18</b>			

# SEMESTER - I

## FUNDAMENTALS OF PROGRAMMING USING C (AUPGDCA - 101)

Credits- 4 (L-3, T-1)

**Objective:** To understand the topics on the programming language C. Also understand the various concepts about C language functions, pointers, structure etc.

**Course Outcomes:**

- Students will be able to programming skills for solving problems
- To implement coding standards using C

**Course Content:**

### SECTION–A

**Programming Tools:** Problem analysis, Program constructs (sequential, decision, loops), Algorithm, Flowchart, Pseudo code, Decision table, Modular programming, Top Down and Bottom up approaches, Concept of High Level Languages, Low Level Languages, Assembly Languages, Compiler, Interpreter, Type of errors.

### SECTION–B

**Overview of C:** General structure of C Program. Data types, Operators and expressions: Constants and Variables, Data types, Declaring Variables, Storage Classes, Different types of expressions and their Evaluation, Conditional Expression, Assignment statement, Enumerated data type, Redefining/Creating data types, Library functions, Type casting. Input/Output: Unformatted and formatted I/O Functions (Character and strings I/O, *Scanf ( )*, *Printf ( )*).

### SECTION–C

**Control Statements:** Decision making using *if*, *if-else*, *elseif* and *switch* statements, Looping using *for*, *while* and *do-while* statements, Transferring Program controlling *break* and *continue* statements, Programming examples to illustrate the use of these control statements.

**Pointers:** Definition, Need of pointers, declaring Pointers, Accessing Values via Pointers, Pointer arithmetic, Types of pointers.

### SECTION–D

**Functions:** Defining a function, Local variables, *return* statement, invoking a Function, specifying and passing arguments to a function, Functions returning non Integer, External, static and register variable, block structure, initialization and recursion.

**Structures:** Declaring a structure type, Declaring Variables of structure type, Initializing Structures, Accessing Elements of structures, arrays of structures, nested structures, Pointers to structures.

**Text Books:**

1. Mullis Cooper: Spirit of C: Jacob Publications
2. Yashwant Kanetkar: Let us C: BPB

**Refrence Books:**

1. Kerningham B.W. & Ritchie D. M.: The C Programming Language: PHI
2. Yashwant Kanetkar: Pointers in C: BPB
3. Gotterfied B.: Programming in C: Tata McGraw Hill

# PC SOFTWARE (AUPGDCA - 102)

## Credits- 4 (L-3, T-1)

**Objective:** To understand the operating system concept. To get to know about a various types of operating system. To get the basic knowledge about MS – Office.

### Course Outcomes:

- To see working of different operating systems
- To implement MS-Office PC Suite

### Course Content:

#### SECTION–A

**Operating System Concept:** Duties, Responsibilities and functions of an Operating system, General understanding of different Operating System Environment (Single user system, Multi user system, Graphical user interface system, character based system).

#### SECTION–B

**Disk Operating System:** Concept of Files and Directories, Internal commands, External commands, Batch Files, Filters, Redirection, Macros, Wild Card character Booting Process, Configuration Files (Config.Sys), General Understanding Of Facilities, Features Of Windows Explorer, Control Panel Setting, Accessories, Recycle Bin.

#### SECTION–C

**Computer Virus:** Prevention, Detection, Cure.

**Word Processing Concepts:** Definition, Benefits, Facilities & Features in general.

**MS - Office 97:** Word processing using MS-WORD, File handling, Editing, Formatting, spell checking, Mail merge & Table handling & Insertion, importing, exporting & object linking embedding, printing operation.

#### SECTION–D

**MS-Excel 97:** Spreadsheets, Entering data & selecting cells, editing worksheet data, formatting worksheet, creating Formulae, function & charts /graphs, multi operation, data base management.

**MS Power Point:** Creating & saving presentation templates & view (slide view, notes view, outline view, slide show) Formatting text, slides & graphs, animations, slides transition, multi operation.

### Text Books:

1. A.L.STEVENS: Teach Yourself Windows.
2. JONATHAN KAMIN: DOS-7.
3. R.K.TAXALLI: Intro to software package, Galgotia publication.
4. RAJIV MATTUS: dos quick reference, Galgotia.
5. RAJIV MATTUS: Learning window 98 step by step BPB publication
6. LONNIE .E. MOSELEY& DAVID M.BOODEY: Mastering office 97

# OPERATING SYSTEM (AUPGDCA - 103)

**Credits- 4 (L-3, T-1)**

**Objective:** To understand the operating system concept. To get to know about different characteristics of operating system.

## **Course Outcomes:**

- To identify the role of different components of operating system
- To implement various strategies for task management in operating system
- To explain various implementation issues in operating system

## **Course Content:**

### **SECTION–A**

**Introduction:** Definition Of The Operating System, Functions Of An Operating System, Different Types Of Systems - Simple Batch System, Multi-Programmed Batched System, Time Sharing System, Personal Computer Systems, Parallel Systems, Distributed Systems, Real Time Systems.

### **SECTION–B**

**Process Management:** Process- Process Concept, Process Scheduling, Operation On Processes, Cooperating Processes, Threads, Inter-Process Communication, CPU Scheduling–scheduling criteria, scheduling algorithms – FCFS, SJF, priority scheduling, round robin scheduling, multilevel queue scheduling, multilevel feedback queue scheduling, multiple processor scheduling, real time scheduling.

**Deadlocks:** Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.

### **SECTION–C**

**Memory Management:** Logical & physical address space, Swapping, Continuous Allocation (single partition, multiple partition), internal, external fragmentation, Paging, Segmentation, Segmentation With Paging, Virtual Memory, Demand Paging, Performance Of Demand Paging, Page Replacement, Page Replacement Algorithms– FIFO, optimal, LRU, LRU approximation algorithms, counting algorithms, Thrashing, Demand Segmentation.

### **SECTION–D**

**File System Implementation:** File System Structure, Allocation Methods contiguous allocation, linked allocation, indexed allocation.

**Secondary Storage Structure:** Disk Structure, Disk Scheduling, FCFS, SSTF, SCAN, C-SCAN, Look Scheduling, Selection of A Scheduling Algorithm, Disk Management-disk formatting, boot block, bad blocks.

## **Text Books:**

1. Silberschatz, Galvin “Operating System Concepts”, Addison Wesley Publishing Company, 1989.

**Reference Books:**

1. William Stallings, "Operating Systems", Macmillan Publishing Company.
2. Deitel H.M., "An Introduction To Operating System", Addison Wesley Publishing Company, 1984.
3. Tanenbaum, A.S., "Modern Operating System", Prentice Hall of India Pvt. Ltd. 1995.

# COMPUTER ORGANISATION AND ARCHITECTURE (AUPGDCA - 104)

**Credits- 4 (L-3, T-1)**

**Objective:** To understand the basic computer organization and design. Also the concept of input-output and memory management.

## **Course Outcomes:**

- To learn about the evolution of computers
- To implement architectural design of computer

## **Course Content:**

### **SECTION–A**

**Basics:** Organization & Architecture, Structure & Function, A brief history, mechanical & electromechanical ancestors, First, Second, Third & later generations, Von - Neumann Machine, Block diagrams of computer system.

**Register transfers & micro-operations:** Register Transfer Language, Register transfer, Bus & memory transfers, Arithmetic loops, Logic loops, Shift loops, Arithmetic, logic, shift unit.

### **SECTION–B**

**Basic computer organization & design:** Instruction codes, Computer registers, Computer Instructions, Timing & Control, Instruction cycle, memory reference instruction, I-O interrupt, Design of basic computer, Design of accumulator logic.

**Micro-programmed Control:** Control Memory, Address sequencing, Design of control unit.

### **SECTION–C**

**Central Processing Unit:** General Register Organization, Stack organization, Instruction formats (zero, one, two, three), Address Instructions, Addressing Modes (direct, indirect, Immediate, relative, indexed), Data transfer & manipulation, Program control.

**Computer Arithmetic:** Addition & Subtraction, Multiplication algorithms, Division Algorithms, Floating point arithmetic operations.

### **SECTION–D**

**IO Organization:** Peripheral devices, I/O interfaces, asynchronous data transfer, Modes of Data transfer, Priority Interrupts, DMA, I-O processors, Serial Communication.

**Memory Organization:** Memory Hierarchy, Main Memory, Associative Memory, Cache Memory, Virtual Memory, Memory management hardware.

**RISC:** Instruction execution characteristics, Use of large register files, Computer based Register optimization, Reduced instruction set architecture, RISC pipeline.

## **Text Books:**

1. Morris M. Mano: Computer System & Architecture: PHI.
2. Stallings & Williams: Computer Organization & Architecture: Maxwell Macmillan.

## **Reference Books:**

1. V.Rajaraman & Radhakrishnan: Introduction to Digital Computer Design: PHI
2. P.Pal Chowdhary: Computer Organization & Design: PHI



# **FUNDAMENTALS OF PROGRAMMING USING C (AUPGDCA – 101 (L))**

**Credits- 1(P-2)**

## **PRACTICAL LIST**

1. Write a program to swap the values of two numbers.
2. Write a program to find out whether the number is even or odd.
3. Write a program to find the largest number among three numbers.
4. Write a program to find the factorial of a number.
5. Write a program to find the factorial of a number using recursion.
6. Write a program to find Fibonacci series.
7. Write a program to count number of digits in an integer.
8. Write a program to sum the digits of a number and reverse the number.
9. Write a program to check whether a number is prime or not.
10. Write a program to calculate average of numbers using arrays.

## **PC SOFTWARE (AUPGDCA – 102 (L))**

**Credits- 1(P-2)**

### **PRACTICAL LIST**

1. Introduction to MS – Word, word processing etc.
2. Introduction to Document previewing.
3. Introduction to Formatting of document via find and replace.
4. Introduction to Mail Merge.
5. Converting a word document into various formats.
6. Use of presentation tools.
7. Introduction to MS – Excel, spreadsheets etc.
8. Inserting and deleting of data.
9. Introduction to mathematical operations.

# **SEMESTER – II**

## **DATA AND FILE STRUCTURE (AUPGDCA - 201)**

**Credits- 4 (L-3, T-1)**

**Objective:** To understand the concepts of arrays, linked list, stacks, queues and tree structures.

**Course Outcomes:**

- To find solutions to various problems using different data structures
- To create computer based solutions to various real - world problems

**Course Content:**

### **SECTION–A**

**Preliminaries:** Concept & notation, common operation on data structures, algorithm complexity, time-space tradeoff between algorithm, physical & logical representation of different data structures.

**Arrays:** Arrays defined, representing arrays in memory, Various operation (traversal, insertion, deletion), Multidimensional arrays, Sparse arrays.

### **SECTION–B**

**Linked List:** Definition, type (linear, circular, doubly linked, inverted), representing linked lists in memory, advantages of using linked list over arrays, various operations on Linked list (traversal, insertion, deletion).

### **SECTION–C**

**Stacks:** Definition & concepts of stack structure, Implementation of stacks, Operation on stacks (push & pop), Application of stacks (converting arithmetic expression from infix notation to polish and their subsequent evaluation), quick sort technique to sort an array, recursion.

**Queue:** Definition & concept of queues, implementation of queue, operation on queues (insert & delete), Type of queues (circular queue, priority queue).

### **SECTION–D**

**Trees Structures:** Tree, Binary Trees, Tree Traversal Algorithms (Pre-Order, In-Order, Post-Order), Threaded Trees, Trees in various Sorting & Searching Algorithms & their Complexity (Heap Sort, Binary Search Trees).

**Sorting & Searching:** Selection sort, Bubble sort, Merge sort, Radix sort, Quick sort, Sequential search, Linear search and their complexity.

**Text Books:**

1. Jean Paul Tremblay & Paul G. Sorenson: An Introduction to Data Structures with Applications: Tata McGraw Hill.
2. Aaron M. Tenenbaum, Yedidyah Langsam, Moshe J. Augenstein: Data Structures using C: PHI

**Reference Books:**

1. Robert L. Kruse: Data Structures & Program Design: PHI
2. Aho, Hopcroft & Ullman: Data Structures and Algorithms: Addison Wesley.

# SYSTEM ANALYSIS AND DESIGN (AUPGDCA - 202)

**Credits- 4 (L-3, T-1)**

**Objective:** To understand the basic development techniques to build software. To study the different phases of software development life cycle model (SDLC).

## **Course Outcomes:**

- To apply design and development principles in the construction of software systems of varying complexity.
- To apply current tools and techniques for computing practice
- To explain system controls and quality assurance techniques

## **Course Content:**

### **SECTION–A**

**Introduction:** Overview of system analysis and design, Business systems concepts, systems development life cycle, project selection, feasibility analysis, design, implementation, testing and evaluation.

### **SECTION–B**

**Project Selection:** Source of project requests, managing project review and selection, preliminary investigation.

**Feasibility Study:** Technical and economic feasibilities, cost and benefit analysis.

### **SECTION–C**

**System requirement specification and analysis:** Fact finding techniques, Data flow diagrams, data dictionaries, process organisation and interactions, Decision analysis, decision trees and tables.

**Detailed Design:** Modularisation, Module Specification, File Design, System Development Involving Data Basis.

### **SECTION–D**

**Systems control and Quality Assurance:** Design objectives, reliability and maintenance, software design and documentation tools, topdown, bottomup and variants. Units and integration testing, testing practices and plans. System controls, Audit trails. System Administration and Training, conversion and Operating Plans. Hardware and software selection, Hardware acquisition, memory, processes, peripherals, bench-marking, vendor selection, software selection, operating systems, languages processes, performance and acceptance criteria.

## **Reference Books:**

1. James, A.S.: Analysis and Design of Information Systems, McGraw Hill, 1986.
2. Ludeberg, M., Gulkoh1, G. & Hilsson, A.: Information Systems Development: A Systematic Approach, Prentice Hall Intern. 1981.
3. Lesson, M.: Systems Analysis and Design, Science research Associates, 1985.
4. Semprive, P.C.: System Analysis: Definition, Process and Design, 1982.

# OBJECT ORIENTED PROGRAMMING & C++ (AUPGDCA - 203)

## Credits- 4 (L-3, T-1)

**Objective:** To understand the object oriented programming using C++. To learn the concepts of loops, structures, functions, objects and classes.

### Course Outcomes:

- To understand Object Oriented approach
- To learn programming real – world examples
- To implement C++ programming

### Course Content:

#### SECTION–A

**Object oriented programming:** Need for OOP, the project oriented approach, characteristics of OOP language-objects, classes, Inheritance, Reusability, Polymorphism, overloading advantage of OOP, the relationship between C and C++.

**Programming Basic:** Basic program construction, output using cout, preprocessor directive, comments, integer variables, character variables, input with cin type float manipulator, type conversion, arithmetic operators, relational operators.

#### SECTION–B

**Loops and decision:** loop- for, while, do, decision-if, if- else, switch, conditional operator, logical operator-AND, OR, NOT, other control statements-break, continue, goto.

**Structures and functions:** structures, Accessing structure members, structure within a structure, Enumerated Data type, simple functions, passing arguments to functions, Returning values from functions, reference arguments, overloaded functions, variable and storage class.

#### SECTION–C

**Objects and classes:** A simple class, classes and objects, specifying a class, using a class, C++ objects as physical objects, C++ objects as data types. Constructors, objects as function arguments, returning objects from functions.

**Arrays:** Array fundamental-defining array, array elements, Accessing array elements, Initializing arrays, multidimensional arrays, passing arrays to functions, array of objects, strings-string variables, Avoiding Buffer overflow, string constants, array of strings string as class members.

#### SECTION–D

**Operator overloading:** Overloading unary operators-the operator keyboard, operator arguments, operator return values nameless temporary objects, limitation of increment operators, overloading Binary operators, data conversion, Pitfalls of operator overloading and conversion.

**Inheritance:** Derived class and base class, specifying the derived class, accessing base class, members, derived class constructors, overriding member functions, class hierarchies, public and private Inheritance, levels of inheritance, multiple inheritance.

**Text Book:**

1. Robert Lafore, "Object oriented programming in Turbo C++." Galgotia Publications.

# **DATABASE MANAGEMENT SYSTEMS (AUPGDCA - 204)**

**Credits- 4 (L-3, T-1)**

**Objective:** To learn about the database and database management system (DBMS). To understand the concept of relational model and structured query language (SQL)

## **Course Outcomes:**

- To formulate using SQL solution to queries
- To apply the concept of transaction management in DBMS
- To explain various views and join operations in DBMS using SQL

## **Course Content:**

### **SECTION–A**

**Introduction:** Basic Concepts, Data Modeling for a Database, Records and Files, Abstraction and Data Integration, The Three-Level Architecture Proposal for DBMS, Components of a DBMS, Advantages and Disadvantages of a DBMS. Data Models, Data Associations, Data Models Classification, Entity Relationship Model, Relational Data Model, Network Data Model, Hierarchical Model.

### **SECTION–B**

**The Relational Model:** Relational Database, Relational Algebra, Relational Calculus. Relational Database Manipulation, SQL, Data Manipulation, Basic Data Retrieval, Condition Specification, Arithmetic and Aggregate Operators, SQL Join: Multiple Tables Queries, Set Manipulation, Categorization, Updates.

### **SECTION–C**

**Views:** SQL, QUEL, Data Definition, Data Manipulation; QUEL, Condition Specification, Renaming, Arithmetic Operators, Multiple Variable Queries, Aggregation Operators in QUEL, Retrieve into Temporary Relation, Updates, Views.

### **SECTION–D**

**Relational Database Design:** Relational Scheme and Relational Design, Anomalies in a Database: A Consequence of Bad Design, Universal Relation, Functional Dependency, Relational Database Design.

**Concurrency Management:** Serializability, Concurrency Control, Locking Scheme, Timestamp-Based Order, Optimistic Scheduling, Multiversion Techniques, Deadlock and Its Resolution. Database Security, Integrity, and Control, Security and Integrity, Threats, Defense Mechanisms, Integrity.

## **Text Books:**

1. Desai, B., “An Introduction To Database Concepts.” Galgotia Publications, New Delhi.

## **Reference Books:**

1. Date C.J., “An Introduction to Database Systems”, Narosa Publishing House, New Delhi.
2. Elimsari And Navathe, “Fundamentals of Database Systems”, Addison Wesley, New York.



# **DATA AND FILE STRUCTURE (AUPGDCA – 201 (L))**

**Credits- 1(P-2)**

## **PRACTICAL LIST**

1. Write recursive program which computes the nth Fibonacci number.
2. Write recursive program which computes the factorial of a given number.
3. Write a program to implement linear search using arrays.
4. Write a program to implement binary search using arrays.
5. Write C programs that implement stack using arrays.
6. Write C programs that implement stack using linked list.
7. Write C programs that implement Queue using array.
8. Write C programs that implement Queue using linked list.
9. Write a program to implement binary tree.
10. Write a program to implement heap sort using arrays.

# **DATABASE MANAGEMENT SYSTEMS (AUPGDCA – 204 (L))**

**Credits- 1(P-2)**

## **PRACTICAL LIST**

- 1.** Introduction to SQL and installation of SQL Server / Oracle.
- 2.** Data Types and Create a database.
- 3.** Write the programs to carry out the following operation:
  - a.** Add a record in the database.
  - b.** Delete a record in the database.
  - c.** Modify the record in the database.
- 4.** List all the records of database in ascending order.
- 5.** Use of Alter and Drop Statements.
- 6.** Working with Views, Indexes.
- 7.** Working with Database Security and Privileges: Grant and Revoke Commands, Commit and Rollback Commands.
- 8.** Working with multiple table queries.
- 9.** Working with inner joins.
- 10.** Working with outer joins.

<b>PhD MECHANICAL</b>		
<b>SUBJECT CODE</b>	<b>SUBJECT NAME</b>	<b>COURSE OUTCOMES</b>
AUPH DRM-101	Research Methodology	Able to apply the knowledge of sampling data & conducting various analysis
AURPE-04	Research & Publication Ethics	
AUPHDME-103(A)	Applied Mechanics and Design	Student will able to solve various problems related to physical materials of daily life
AUPHDME-103(B)	Fluid Mechanics and Thermal Sciences	Student will able to solve various problems related to fluid properties, statistics, measurements flow through pipes
AUPHDME-104(A)	Material, Manufacturing and Industrial Engineering	Able to acquire and apply knowledge of material technology, its components and its characteristics Able to apply the knowledge of sampling data in conducting various surveys and analysis
AUPHDME-104(B)	Industrial Tribology	Able to acquire and apply knowledge on industrial tribology, wear friction, lubrication its components and its characteristics
AUPHDME-105	Seminar and Presentation	Student will able to enhance their presentation, discussion, learning & listening skills. Will able to learn argument and questioning techniques etc.
<b>PhD COMPUTER SCIENCE ENGINEERING</b>		
AUPH DRM-101	Research Methodology	Able to apply the knowledge of sampling data & conducting various analysis
AURPE-04	Research & Publication Ethics	
AUPHDCSE-103(A)	Cloud Computing	To explain the core issues of cloud computing such as security, privacy, and interoperability. Choose the appropriate technologies, algorithms, and approaches for the related issues. identify problems, and explain, analyze, and evaluate various cloud computing solutions
AUPHDCSE-103(B)	Advance Software Engineering	Basic knowledge and understanding of the analysis and design of complex systems. Ability to apply software engineering principles and techniques. Ability to develop, maintain and evaluate large-scale software systems.
AUPHDCSE-104(A)	Software Testing and Auditing	Ability to apply software engineering principles and techniques. Ability to develop, maintain and evaluate large-scale software systems.
AUPHDCSE-104(B)	Theory of Computation	To introduce students about the mathematical foundations of computation including

		automata theory; the theory of formal languages and grammars; the notions of algorithm, decidability, complexity, and computability.
<b>AUPHDCSE-105</b>	<b>Seminar and Presentation</b>	Student will able to enhance their presentation, discussion, learning & listening skills. Will able to learn argument and questioning techniques etc.
<b>PhD CIVIL ENGINEERING</b>		
<b>AUPH DRM-101</b>	<b>Research Methodology</b>	Able to apply the knowledge of sampling data & conducting various analysis
<b>AURPE-04</b>	<b>Research &amp; Publication Ethics</b>	
<b>AUPHDCE-103(A)</b>	<b>Advance Concrete Technology</b>	Information on various ingredients, their physical and chemical properties including properties of green and hardened concrete Mix design procedures as per BIS, ACI and British mix methods, including design of concrete using fibers and mineral architecture.
<b>AUPHDCE-103(B)</b>	<b>Repair &amp; Rehabilitation of Structure</b>	Student will able to acquire and apply knowledge of repair & rehabilitation techniques & estimation of quantities and will able to analysis rates and valuations of different materials related to construction and repair.
<b>AUPHDCE-104A)</b>	<b>Composite Material</b>	Able to Plan the quality checks and bring about economy in concrete construction.
<b>AUPHDCE-104(B)</b>	<b>Structural Engineering</b>	Student will able to solve various problems related to physical and mechanical aspects of civil constructions

## **School of Basic Science, Deptt. of Zoology**

### **Programme Outcomes (POs)**

- Students gain knowledge and skill in the fundamentals of animal sciences, understands the complex interactions among various living organisms.
- Analyze complex interactions among the various animals of different phyla, their distribution and their relationship with the environment.
- Apply the knowledge of internal structure of cell, its functions in control of various metabolic functions of organisms.
- Understands the complex evolutionary processes and behavior of animals.
- Correlates the physiological processes of animals and relationship of organ systems.
- Understanding of environmental conservation processes and its importance, pollution control and biodiversity and protection of endangered species
- Gain knowledge of Agro based Small Scale industries like vermicomposting preparation.
- Understands about various concepts of genetics and its importance in human health.
- Apply ethical principles and commit to professional ethics and responsibilities in delivering his duties.
- Apply the knowledge and understanding of Zoology to one's own life and work.
- Develops empathy and love towards the animals.

### **Programme Specific Outcomes (PSOs)**

- Understand the nature and basic concepts of cell biology, genetics, biotechnology, physiology and medical zoology.
- Analyze the relationships among animals and microbes.
- Perform procedures as per laboratory standards in the areas of Animal Physiology, Environmental biology, Genetics, Medical Zoology, Endocrinology and Techniques in Biology, Toxicology, Entomology, Biochemistry, Biotechnology, Immunology and research methodology.
- Understand the applications of biological sciences in Entomology and Medicine.
- Gains knowledge about research methodologies, effective communication and skills of problem solving methods.
- Contributes the knowledge for Nation building.

### **Course Outcomes (COs)**

#### **AUZoo 101: Structure and Function of Animals – I**

- Describe general taxonomic rules on animal classification.
- Classify Protista up to phylum using examples from parasitic adaptation.
- Classify Phylum Porifera to Echinodermata with taxonomic keys.
- Describe Phylum Nematoda and give examples of pathogenic Nematodes.
- Describe Mouthparts of Insects.

### **AUZoo 102: Biostatistics and Computer Applications**

- Came to know the data collection, tabulation and presentation.
- Described the mean, median, mode and SD.
- Understood the Analysis of Variance.
- Described Student 't' test and probability
- Understood the Correlation and Regression.
- Students gain skills in basics of computers, operating systems, overview of programming languages
- Application of internet and statistical bioinformatics in research.

### **AUZoo 103: Biodiversity and Wildlife**

- Biodiversity and conservation explore natural landscapes, species and ecosystems and acquires theories and practical methods in preserving environments and organisms.
- Biodiversity refers not only to endangered species but also to every organisms.
- Biodiversity and Conservation increase awareness and understanding of how human life depends on preserving animal species and natural ecosystems.
- Biodiversity and conservation is connected to similar disciplines like environmental science, natural resources management and animal sciences.
- Conserving biodiversity in the face of pressures such as land clearing, pest plants and animals and climate change is a challenge facing land managers and policy-makers globally.
- Key threats to biodiversity, including habitat modification and loss, unsustainable resource use, introduced species and climate change.
- Management actions that are used to mitigate threats to biodiversity, including selecting nature reserves, connectivity and wildlife corridors, ecosystem restoration and control of pest plants and animals.
- Policies to conserve biodiversity.

### **AUZoo 104: Environmental Biology and Toxicology**

- It is a discipline overlapping with biology, chemistry, medicine that involves the study of toxic agents their mechanism of action.
- It involves the study of the adverse effects of chemical substances on living organisms.
- Skill development in environmental and occupational Toxicology.
- It provides opportunities for student's research projects, internships in assessing the effects of toxic pollutants on the environment and in the food chain.

### **AUZoo 201: Animal Physiology and Endocrinology**

- An integrated Understanding of physiological mechanisms.
- Described the physiology of digestive and respiratory system of human beings.
- Understood the blood composition, types, groups and circulatory system.
- Described the physiology of excretory system and nervous system of human beings.

- Came to know the physiology of sense organs, muscles and reproductive system.

### **AUZoo 202: Metabolic Regulations of Cell**

- Identified the classes of biomolecules and their monomeric building blocks.
- Explained the specificity of enzymes (biochemical catalysts), and the chemistry involved in enzyme action.
- Understood types, Structure, biochemical properties and functions of proteins.
- Explained how the metabolism of organic compounds leads ultimately to the generation of large quantities of ATP.
- Described the structure and classification of hormones.

### **AUZoo 203: Structure and Function of Animals-II**

- Imparts conceptual knowledge of vertebrates, their adaptations and associations in relation to their environment.
- Classification of muscles, General features of the Integument, Specializations of integument.
- Evolution of Skin, Integumentary System: Embryonic origin.
- Comparative account of skeleton system in vertebrates.
- Chemical coordination of body functions through neuro-secretion.
- Evolution of functional anatomy of brain.

### **AUZoo 204: Medical Zoology**

- Understands about composition of blood, blood born diseases, autopsy and biopsy.
- Types of immunity, antigens-antibodies and their properties.
- An overview to the parasitology, animal associations and host-parasite relationship.
- A study of the immune response to parasite and self-defense mechanisms, immune evasion and biochemical adaptations of parasites.

### **AUZoo 301: Biotechnology**

- Understood cell structure, scope of biotechnology.
- Described the Gene cloning and gene transfer methods.
- Came to know the concept of PCR, Screening of recombinant clones, nucleic acid hybridization, DNA sequencing, DNA fingerprinting.
- Described the Animal tissue culture techniques.
- Understood Embryo transfer & transgenic animal technology.

### **AUZoo 302: Immunology**

- Outline the key components of the innate and adaptive immune responses.
- Described about cell types and organs which are involved in an immune response.

- Described the Infectious diseases, hypersensitivity, autoimmune disorders, and immunodeficiency diseases.
- An overview of development and survival of lymphocytes, humoral immune response, production of effector T- Cells and effector mechanisms.
- Description of effector mechanisms, NK and NKT cell functions.
- Conceptualization of regulation of immune response, mucosal immunity, immunological memory, cytokines and chemokines. T- Cell mediated regulation of immune response, Immunological tolerance and allergy.
- Importance of immunity in health and disease, evasion of the immune response by pathogens.

### **AUZoo 303: Molecular Biology and Genetics**

- Described the fundamental molecular principles of genetics
- Understood the structure and function of DNA & RNA
- Understood about the transmission, distribution, arrangement, and alteration of genetic information and how it functions and is maintained in populations
- Described the basics of genetic mapping.
- Described the ultra-structure and functions of cell organelles
- Understood DNA replication, RNA and protein synthesis and came to know protein Synthesis can be controlled at the level of transcription and translation.

### **AUZoo 304: Developmental Biology**

- Understood the basic concepts of developmental biology.
- Understood how fertilization, cleavage and gastrulation occur.
- Understood the basic concepts of organogenesis.
- Understood about the basic concepts of growth, regeneration and ageing
- Described the test tube baby and placentation in mammals.

### **AUZoo 401: Techniques in Biology**

- Students gain knowledge about various tools & techniques used in the laboratory.
- Understood the basic principles of Microscopy, Spectrophotometry, Chromatography, Flow cytometry and Electrophoresis.
- Understood the knowledge of basic Serological assays like ELISA, IFA.

### **AUZoo402: Specialization Paper: Entomology/Molecular Parasitology/ Animal Behaviour/Genomics/Fish Biology/ Endocrinology**

#### **AUZoo 402: Entomology**

- Students gain knowledge about classification and morphology of insects and its larvae.
- Understood Systematic position, host plants, nature of damage and outlines of the life cycle of the pests of crops, vegetables and fruits.



- Understood pests of stored food products with particular reference to their habits, nature of damage caused by them and outlines of their life cycles.
- Understood the knowledge of integrated pest management (IPM).
- Learn how insects become pests and learn various methods to control the pests.

#### **AUZoo 402: Molecular Parasitology**

- An overview to the parasitology, animal associations and host-parasite relationship.
- Understanding the mode of infection of parasite, molecular biology of parasite and drug targets, mechanism of drug resistance, vaccine strategies and proteomic approaches, vaccine strategies.
- A study of the immune response to parasite and self-defense mechanisms, immune evasion and biochemical adaptations of parasites.
- A detailed understanding of parasites of veterinary importance and their management.
- Description of parasites of insects and their significance, nematode parasites of plants and host parasite interactions.

#### **AUZoo 402: Animal Behaviour**

- An overview of animal behavior, orientation to primary and secondary orientation; kinesis-orthokinesis, klinokinesis; taxis - different kinds of taxis; sun-compass orientation, dorsal- light reaction.
- Devising conservation strategies for different animal species. Learning and instincts: conditioning, habituation, sensitization, reasoning.
- Developing compassion towards other animals as well as other individuals, group selection, kin selection and inclusive fitness, cooperation, and alarm call.
- Evaluating other individuals of the society and taking decisions.

#### **AUZoo 402: Genomics**

- Detailed understanding of structure and organization of genomes along with their comparative account.
- Knowledge of transposable elements, retro-transposons, SINE, LINE, Alu and other repeat elements, pseudogenes, segmental duplications.
- Developing skills in how to map genomes and to integrate physical and genetic maps.
- To develop technical knowhow on sequencing genomes including high-throughput sequencing, strategies of sequencing and assessment of quality of genome-sequence data.
- Detailed exposure to bioinformatics tools and techniques for genomic analysis.
- Elucidation of comparative genomics methods.
- Development of skill to perform large scale mutagenesis and interference for genome wide gene targeting with different experimental approach.
- Making detailed understanding of the procedures and importance of transcriptome analysis, profiling, proteomics - expression analysis, protein structure analysis, protein-protein interaction.

### **AUZoo 402: Fish Biology**

- Learning classification of riverine fisheries and their hydrological conditions.
- A detailed understanding of cold water fisheries, biology of important cold water fishes of India for better production of fishes in extreme condition.
- Learning fishing techniques for localizing catches- remote sensing, sonar, radar; crafts and gears.
- An overview of post-harvest technique to prevent fish spoilage for better preservation and quality control.
- Learning the management of aquatic pollution, waste management and fisheries extension services.
- Learning aquaculture technology for fresh and marine fishes.
- Management of water quality requirements for aquaculture.
- Learning integrated farming by fish-cum-livestock farming, paddy-cum-fish farming, and aquaculture engineering-aqua house.
- A detailed learning of transportation of finfish and shellfish, eggs, fry, fingerlings and adults.
- Managing improvement in the Nutrition of aquatic animals by leaning feed types, manufacture and ingredients, anti- nutritional factors in fish feed ingredients.
- Understanding environmental impact of aquaculture, aqua cultural wastes and future developments in waste minimization.
- Learning about fish vaccines- strategy and use in aquaculture.

### **AUZoo 402: Endocrinology**

- General understanding of anatomical and structural organization of neuroendocrine organs. .
- Detailed understanding of the hypothalamo- hypophyseal axis and role of hormones.
- Knowledge of regulation of hypothalamic and pituitary hormone secretion. .
- Conceptualization of feed-back inhibition and feed-forward activation of neurohypophyseal hormones.
- Understanding of the link between environment and reproduction.
- Illustration of neuroendocrine regulation of immune system.
- Description of discovery of hormones as chemical signals for control and regulation of physiological processes. \
- Understanding the nature of hormonal action and its experimental methods of evaluation.
- Elucidation of biosynthesis of protein hormones and molecular mechanisms of regulation.
- Knowledge of signal discrimination, signal transduction and signal amplification in hormone regulated physiological processes.

## School of Basic sciences

### Department Mathematics

#### Programme outcomes

- To cultivate a mathematical attitude and nurture the interests,
- To motivate for research in mathematical and statistical sciences,
- To train computational scientists who can work on real life challenging problems
- **AUMath-101. Real Analysis-I**
- To introduce basics in mathematics.
- To improve analytical skill.
- **AUMaths-102. Advanced Algebra-I**
- A major objective is to introduce students to the language and precision of modern algebra. This means that the course will be proof-based, in the sense that students will be expected to understand, construct, and write proofs.
- A challenge for all students of mathematics is to balance the understanding with the communication. There is a tendency to think you are finished once you see why a mathematical statement is true or false.
- **AUMaths-103. Ordinary differential Equations**
- define an ordinary differential equation,
- differentiate between an ordinary and partial differential equation, and
- Solve linear ordinary differential equations with fixed constants by using classical solution and Laplace transform techniques.
- **AUMaths-104. Operation Research-I**
- To do things best under the given circumstances
- This general concept has great many applications.
- **AUMaths-105. Fluid dynamics**
- Calculate the pressure distribution for incompressible fluids.
- Calculate the Hydrostatic pressure and force on plane and curved surfaces.
- Demonstrate the application point of hydrostatic forces on plane and curved surfaces.
- Formulate the problem on buoyancy solve them.
- **AUMaths-201. Real Analysis-II**
- Describe the fundamental properties of the real number that underpin the formal development of real analysis.
- **AUMaths-202. Advanced algebra-II**
- Demonstrate capacity for mathematical reasoning through analysing, proving and explaining concepts from field extensions and Galois theory.
- Explain the fundamental concepts of field extensions and Galois theory and their role in modern mathematics and applied contexts.
- **AUMaths-203. Partial Differential Equations**
- To equip students with the concepts of partial differential equations and how to solve linear Partial Differential with different methods. Students also will be Introduced to

some physical problems in Engineering models that results in partial differential equations.

- **AUMaths-204. Classical Mechanics**

- To demonstrate knowledge and understanding of the following fundamental concepts in:
  - the dynamics of system of particles,
  - motion of rigid body,
  - Lagrangian and Hamiltonian formulation of mechanics
- To represent the equations of motion for complicated mechanical systems using the Lagrangian and Hamiltonian formulation of classical mechanics.
- To develop math skills as applied to physics.

- **AUMaths-205. Solid Mechanics**

- To apply the formal theory of solid mechanics to calculate forces, deflections, moments, stresses, and strains in a wide variety of structural members subjected to tension, compression, torsion, bending, both individually and in combination, including :
  - axially loaded bars
  - components in pure shear
  - circular shafts in torsion
  - beams in bending
  - thin-walled pressure vessels
  - trusses
- To understand the concepts of stress at a point, strain at a point, and the stress-strain relationships for linear, elastic, homogeneous, isotropic materials.
- To determine principal stresses and angles, maximum shearing stresses and angles, and the stresses acting on any arbitrary plane within a structural element.
- 4 To draw Free Body Diagrams (FBD) for rigid bodies, beams, 2-D and 3-D structures, frames and machines, and set up equilibrium equations (i.e. forces and couples) for them.

- **AUMaths-301. Complex Analysis-I**

- Identify curves and regions in the complex plane defined by simple expressions.
- Describe basic properties of complex integration and having the ability to compute such integrals.
- Decide when and where a given function is analytic and be able to find it series development.
- Describe conformal mappings between various plane regions.
- Present the central ideas in the solution of Dirichlets problem.
- Give the main ideas in the proof of the Riemann mapping theorem.

- **AUMaths-302 Topology**

- Topology is used in many branches of mathematics, such as differentiable equations, dynamical systems, knot theory, and Riemann surfaces in complex analysis.
- It is also used in string theory in physics, and for describing the space-time structure of universe.

- **AUMaths-303 Analytic number Theory**

- Analytic number theory aims to study number theory by using analytic tools (inequalities, limits, calculus, etc).
- In this course we will mainly focus on studying the distribution of prime numbers by using analysis.

- **AUMaths-304 Operation Research –II**
- The aims of operation research include: solving operational questions, solving questions related to resources' operations, and solving decision-making questions. . . Operational research has a relation with different areas of study and it has several applications.
- Operation research is considered as a tool of productivity.
- **AUMaths-305 Mathematical Statistics**
- Calculate covariance and correlation and determine independence of random variables; obtain expectations and variances for linear combinations of random variables.
- Find the distribution of a function of random variables using the methods of distribution functions, transformations, and moment generating functions; perform bivariate transformations using Jacobians; calculate joint distributions and moments of order statistics.
- **AUMaths-401 Complex Analysis-II**
- To understand the Harmonic functions on a disc and concerned results.
- To understand the factorization of entire functions having infinite zero.
- To Understand certain theorems like Inverse Function theorem, Hardmards three circle theorem.
- **AUMaths-402 Functional Analysis**
- The objectives of the course are the study of the main properties of bounded operators between Banach and Hilbert spaces, the basic results associated to different types of convergences in normed spaces and the spectral theorem and some of its applications.
- **AUMaths -403 Advanced Discrete Mathematics**
- The course objective is to provide students with an overview of discrete mathematics. Students will learn about topics such as logic and proofs, sets and functions, probability, recursion, graph theory, matrices, Boolean algebra and other important discrete math concepts.
- **AUMaths-404 Differential Geometry**
- To get introduced to the notion of serret -frenet frame for space curves and the involutes and evolutes of space curves with the help of examples.
- To able to compute the curvature and torsion of space curves.
- To get introduced to geodesics on a surface and their characterization.
- **AUMath-405 Magneto Fluid Dynamics**
- The fundamental concept behind MFD is that magnetic fields can induce currents in a moving conductive fluid, which in turn polarizes the fluid and reciprocally changes the magnetic field itself. . The set of equations that describe MHD are a combination of the Navior Stoke's Equation of fluid dynamics and Maxwell's equations of electro-magnetism. These differential equations must be solved simultaneously, either analytically or numerically.

## SCHOOL OF BASIC SCIENCES

### MSc Chemistry

#### **After completing M.Sc. Chemistry programme, students will be able to: Knowledge Outcomes:**

**PO1:** Demonstrate and apply the fundamental knowledge of the basic principles in various fields of Chemistry

**PO2:** Create awareness and sense of responsibilities towards environment and apply knowledge to solve the issues related to Environmental pollution.

**PO3:** Apply knowledge to build up small scale industry for developing endogenous product.

**PO4:** Apply various aspects of chemistry in natural products isolations, pharmaceuticals, dyes, textiles, polymers, petroleum products, forensic etc. and also to develop interdisciplinary approach of the subject.

#### **1. AUMCH I-01- Inorganic Chemistry**

- Inorganic Chemistry Principles is a transferable course. It is designed to meet the needs of the medical technology student in general. This course helps the student to develop an understanding of chemical principles and the applications of such principles to the Health Science field.

#### **2. AUMCHI-02- Organic Chemistry**

- Predict and explain patterns in shape, structure, bonding, hybridization, formal charge, stability, acidity, basicity, solubility, and reactivity for hydrocarbons, halocarbons, alkenes, dienes, and arenes, by understanding and applying concepts of organic chemical structure and bonding and stability.

#### **3. AUMCHI-03- Physical Chemistry**

- Represent of the rate law of the elementary and chain reaction
- Understand of the theories for the determination of the rate of the reactions
- Understand of the kinetics of the explosive photochemical and unimolecular reactions

#### **4. AUMCHI-04- Mathematics for Chemist & Applications of Computer in Chemistry**

- inculcate logical thinking to address a problem and become result oriented with a positive attitude.

#### **5. AUMCHI-05- Inorganic Chemistry Lab**

- prepare the exact solutions for quantitative analysis.
- Apply the knowledge of quantitative analysis for the determination of metals from ores/alloys.

#### **6. AUMCHI-06- Organic Chemistry Lab**

- understand concepts of stereochemistry and will be able to stereochemical aspects in organic chemistry.
- develop knowledge of substitution (electrophilic, nucleophilic), addition and elimination reactions.

#### **7. AUMCHI-07- Physical Chemistry Lab.**

- prepare the solution of the desired concentration and the desired volume
- CO2: Know the principle and handling of pH meter, Potentiometer, conductivity meter, colorimeter, viscometer, etc

**8. AUMCHI-08- Inorganic Chemistry**

- correlate application of symmetry to spectroscopy and find IR active modes of vibration.
- Understand the detail chemistry of s- and p- block elements w.r.t. their compounds, reactions and applications.

**9. AUMCHI-09- Organic Chemistry**

- Understand of Bioinorganic Chemistry: Use of metals in biological systems, various aspects of coordination chemistry related to bioinorganic research, metallobiopolymers, their structure, function, role of metal ion, etc.

**10. AUMCHI-10- Physical Chemistry**

- Understand of the principle of Microwave, IR, Raman, Electronic, NMR, ESR and Mossbauer spectroscopy.

**11. AUMCHI-11- Chemistry of Life & Environmental Chemistry**

- apply the techniques for structure determination of organic molecules.
- perform statistical analysis of chemical data by developing analytical mind.

**12. AUMCHI-12- Inorganic Chemistry Lab.**

- prepare the exact solutions for quantitative analysis.
- Apply the knowledge of quantitative analysis for the determination of metals from ores/alloys

**13. AUMCHI-13- Organic chemistry Lab**

- understand concepts of stereochemistry and will be able to stereochemical aspects in organic chemistry.
- develop knowledge of substitution (electrophilic, nucleophilic), addition and elimination reactions.

**14. AUMCHI-14- Physical chemistry Lab**

- synthesize Inorganic complexes and also find their purity

**15. AUMCH2-15- Inorganic Chemistry**

- utilize their knowledge in practicals for various heterocyclic and photochemical conversions.

**16. AUMCH2-16- Organic Chemistry**

- understand how to carry out different types of reactions and their workup methods.

**17. AUMCH2-17- Physical Chemistry**

- Draw of the schematic Microwave, IR and Raman spectrum of di and triatomic molecules based on the selection rules.
- Understand of decay kinetics and measurement of radioactivity
- get knowledge of types of nuclear reactors
- study the applications of radioactivity, Understand Radiolysis and radicals

**18. AUMCH2-18- Inorganic/Organic/Physical Chemistry special.**

- understand how to carry out different types of reactions and their workup methods.

**19. AUMCH2-19- Inorganic Chemistry Lab**

- Understand Ion-exchange chromatography for separation of metal ions.
- Understand the principle and working of different instruments like colourimeter, conductometer, spectrophotometer, etc.

**20. AUMCH2-20- Organic Chemistry Lab.**

- understand various reactions and rearrangements.

- understand and write mechanism of reactions and their applications.
- understand how to convert one molecule into another by using oxidising and reducing reagents.
- apply theoretical knowledge in practical's for various conversions.

#### **21. AUMCH2-21- Physical chemistry Lab**

- understand the synthesis of various drugs.
- understand the mode of action of different anti-fungal, anti-bacterial and anti-viral drugs.

#### **22. AUMCH2-22- Advanced Organometallics**

- utilize their knowledge in practicals for various heterocyclic and photochemical conversions.

#### **23. AUMCH2-23- Modern Techniques of Chemical Analysis**

- understand the Principles of mass spectroscopy, gas chromatography and HPLC
- apply the techniques for structure determination of organic molecules.
- perform statistical analysis of chemical data by developing analytical mind.

#### **24. AUMCH2-24- Inorganic Spectroscopy**

- Understand the effect of various ligand field strengths on d-metal ions and find out ground state terms with their energies, microstates, degeneracy and microstate table for different transition metal ions and complexes

#### **25. AUMCH2-25- Bio- Inorganic Chemistry**

- Understand the effect of various ligand field strengths on d-metal ions and find out ground state terms with their energies, microstates, degeneracy and microstate table for different transition metal ions and complexes.

#### **26. AUMCH2-26- Synthetic Strategy**

- Industrial applications of organometallic compounds in organic reactions.
- Mechanisms of organometallic reactions.
- Stereochemistry of the organometallic reactions.

#### **27. AUMCH2-27- Natural Products**

- understand different Secondary metabolites and their importance.
- become familiar with many reagents used in organic synthesis.
- understand nature better by studying mechanisms in biological reactions.
- understand various laboratory methods to determine structure of unknown organic

#### **28. AUMCH2-28- Medicinal Chemistry**

- understand the stereochemistry of carbohydrates and their reactions.
- understand the concept of chiral templates and chiral drugs
- understand the synthesis of various drugs.
- understand the mode of action of different anti-fungal, anti-bacterial and anti-viral drugs.

#### **29. AUMCH2-29- Polymer Chemistry**

- Use of metals in biological systems, various aspects of coordination chemistry related to bioinorganic research, metallobiopolymers, their structure, function, role of metal ion, etc.



### **30. AUMCH2-30- Advanced Quantum Chemistry**

- understand various ways of attack on electrophilic species by a nucleophile
- to predict enantioselective product.
- understand mechanisms in asymmetric reaction

### **31. AUMCH2-31- Solid State Chemistry**

- To provide an introduction to the concepts underlying solid state chemistry
- To illustrate the wide range of materials and physical properties that currently available

### **32. AUMCH2-32- Biophysical Chemistry**

- understand various terminologies in stereochemistry.
- will be able to draw the stereochemical structures of different molecules.

### **33. AUMCH2-33- Chemistry of Macromolecules**

- account for the basis of biological macromolecules' constitution and traits
- explain structural mechanisms for how important biological processes take place and are controlled, for example catalysis, cell signalling and translation
- account for the principles of the most important methods for structural analysis: X-ray crystallography, NMR spectroscopy and electron microscopy and analyse the quality of models produced by these methods
- analyse structural details in macromolecules using a molecular graphics program

**Programme and course outline** of Agricultural Entomology  
According to 4<sup>th</sup> Dean's Committee

**Programme: Agricultural Entomology**

**Programme outcome:**

1. Attain a solid foundation in insect biology, including general entomology, basic systematics, morphology, physiology, and biodiversity.
2. Understand evolution and biodiversity generation through macro- and micro-evolutionary processes, including how these processes have formed and diversified insects.
3. Develop the ability to read and interpret scientific papers in entomology, and critically assess content.
4. Attain skills in written and verbal scientific communication.
5. Develop the ability to design and perform a scientific study on insects, and to analyze results.
6. Develop an understanding of the distributions and abundances of organisms including insects, and their interactions with each other and the environment.
7. Learn modern techniques in insect science such as molecular biology, bioinformatics, and/or imaging.

Sr. No.	Course Outline	Topic	Course Outcome
1	AU.Ento.121	Insect Morphology and Systematics	This course helps the students to attain a solid foundation in insect biology, including general entomology, basic systematics, morphology, physiology, and biodiversity
2	AU.Ento.121	Insect Ecology and Integrated Pest Management including Beneficial insects	Ecologically based management relies on a comprehensive knowledge of the ecosystem, including the natural biological interactions that suppress pest populations. It is based on the recognition that many conventional agricultural practices disrupt natural processes that suppress pests.
3	AU.Ento.121	Crop Pests and Stored Grain Pests and their Management	This course helps the students to gain knowledge about different insect-pests associated with different horticultural, ornamental, plantation and stored crops. The knowledge of pests and their damage is helpful in deciding proper control measures for their management.
4	AU.Cr.Prot.474 (Ento./Path0o.)	IPM and IDM (Pest Disease Scouting)	<ul style="list-style-type: none"> <li>✓ Pest Surveillance and Pest forecasting techniques</li> <li>✓ Pest management methods including recent methods</li> <li>✓ Beneficial insects and their mass multiplication techniques</li> <li>✓ Acquaintance of insecticide formulations</li> <li>✓ Sampling techniques for the estimation of insect population and damage</li> <li>✓ Identification of major non-insect pests</li> <li>✓ Acquaintance of mass multiplication techniques of important predators</li> </ul>
5	AU.Cr.Prot.475 (Ento.)	Non-insect pests and their Management	There is a group of animal other than the insects, which cause the considerable yield losses to agricultural crops and commonly called as non insect pests which may include mammals (monkey, wild animals etc), rodents, birds, mites. The latest control problems are caused by non insect pests are not control by planting a resistant variety and advocate use of pesticides. Controlling these invasive species presents an unparalleled challenge worldwide. So, knowledge of such non-insect pests is very important and this course helps the students to attain the knowledge of such organisms.
6	AU.Cr.Prot.476 (Ento.)	Apiculture	Apiculture or beekeeping is a kind of occupation that helps the students to get well versed with nurturing and looking after bees for the purpose of acquiring bee products like beeswax, honey, royal jelly, flower pollen and bee pollen.
7	AU.Cr.Prot.477 (Ento.)	Pesticide and Plant Protection Equipment	This course consists of basic knowledge on pesticides, pesticide preparing, principle on pesticide application, introduction about different type of pesticides and their mode of action, pesticide resistance, principle on integrated management of pests, effect of pesticides on ecosystem and environment, bio-originated pesticides, and innovation and development of pesticides. Based on class learning and experiment, the students should hold the

			basic knowledge and principal method about pesticide application, clarify correlation among chemical control, integrated management, and environmental protection, and gain a foundation for further application of pesticides in practice.
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**Programme and course outline of  
Master of Science Agronomy (Agriculture)**

Sr. No.	Code	Course Title	Course Outcome
1.	AU. Agron. 501	Modern Concepts in Crop production	To impart knowledge on advanced concepts of crop growth and productivity in relation to climate change, modern concepts of tillage and farm mechanization, principles and components of organic farming, precision farming and resource conservation technology
2.	AU. Agron. 502	Principles and Practices of Soil Fertility and Nutrient Management	To understand the knowledge on functions and deficiency symptoms of plant nutrients, nutrient cycle, preparation and use of organic manures, time and methods of commercial fertilizers application
3.	AU. Agron. 503	Principles and Practices of Weed Management	To understand the knowledge on weed biology, classification and characteristics, herbicide application techniques, different methods of weed control and integrated weed management
4.	AU. Agron. 504	Principles and Practices of Water Management	To understand the principles involved in estimating water requirement for different crops, irrigation scheduling and approaches, ideologies pertaining to water management in problem soils
5.	AU. Agron. 505	Agrometeorology and Crop Weather Forecasting	To acquire knowledge on agro meteorology and its different variables, onset and withdrawal of monsoon, crop seasons, evapo transpiration and its effect on crop production and crop weather calendars
6.	AU. Agron. 506	Agronomy of Major Cereals, and Pulses	To have knowledge about the <i>Kharif</i> cereals, <i>Rabi</i> cereals, <i>Kharif</i> pulses, and <i>Rabi</i> pulses and their cultivation practices with post harvest technologies
7.	AU. Agron. 507	Agronomy of Oilseed, Fibre and Sugar Crops	To gain knowledge about importance of oilseed, fibre and sugar crops, their beneficial and economic importance to the farming communities and cultivation practices
8.	AU. Agron. 508	Agronomy of Medicinal, Aromatic and Under- utilized Crops	To impart knowledge on importance of medicinal and aromatic plants, cultural practices, climate and soil requirements
9.	AU. Agron. 509	Agronomy of Fodder and Forage Crops	To impart knowledge on adaptation, distribution, improved varieties, quality aspects, cultural practices of important

			fodder crops, year round fodder production and management, methods of hay and silage making
10.	AU. Agron. 510	Agrostology and Agroforestry	To gain knowledge about importance and ecology of grassland, pasture and agro forestry system, crop production in agrostology and agroforestry, silvipastoral system, tree characteristics and nutritive value
11.	AU. Agron. 511	Cropping Systems	To impart knowledge on definition, concept and types of cropping system, allelopathic effects, competition relations, crop diversification for sustainability, crop residue management, plant ideotypes
12.	AU. Agron. 512	Dryland Farming	To gain knowledge about concept of dry land farming, constrains of crop production in dry land areas, drought, contingent crop planning, drought management strategies, techniques and practices of soil moisture conservation
13.	AU. Agron. 513	Principles and Practices of Organic Farming	To have knowledge about basic concept of organic farming, types of organic manures, biofertilizers, crop rotation, intercropping, allelopathy and crop diversification
14.	AU. Agron. 591*	Master Seminar	Presentation skills, discussion skills, listening skills, argumentative skills, critical thinking, help students to immerse themselves in the topic
15.	AU. Agron. 599*	Master Research	To work on a research independtly, develop thoughts and ideas, improve writing skills,

**After completing master degree courses the candidates have further teaching and research studies option. Candidates can work in the private sector on applied research and product development or engage in basic research, mainly in universities or government agencies**



**Programme Course outcome of Agronomy**  
**According to 5<sup>th</sup> Deans' Committee**

Sr. No	Course outline	Topic	Course outcome
1.	AU. Agron. 111	Fundamentals of Agronomy	<ul style="list-style-type: none"> <li>• Students will gain knowledge on the fundamentals of agronomy.</li> <li>• Hands on training on various production methods and important cultural practices for major cereals, pulses, sugar, oilseed and fibre crops will be provided (Practical)</li> </ul>
2.	AU. Agron. 112	Agricultural Heritage	<ul style="list-style-type: none"> <li>• To know the basics of the agriculture, tillage and evolution of agriculture from different periods from veda to modern agriculture.</li> </ul>
3.	AU. Agron. 233	Crop Production Technology-I (Kharif Crops)	<ul style="list-style-type: none"> <li>• To impart knowledge on various cultivation practices of different Kharif crops</li> </ul>
4.	AU. Agron. 244	Introductory Agrometeorology and Climate Change	<ul style="list-style-type: none"> <li>• To learn different metrological parameters like rainfall, temperature, RH and other weather parameters.</li> <li>• To make short-range and long-range weather forecasts.</li> </ul>
5.	AU. Agron. 245	Crop Production Technology-II (Rabi Crops)	<ul style="list-style-type: none"> <li>• Students will get knowledge on crop production technologies of different Rabi crops.</li> </ul>
6.	AU. Agron. 246	Farming System and Sustainable Agriculture	<ul style="list-style-type: none"> <li>• Students will know different cropping and farming system like integrated farming system (IFS).</li> <li>• To get knowledge on sustainable agricultural practices such as</li> </ul>



			organic farming.
7.	AU. Agron. 247	Agrochemicals	<ul style="list-style-type: none"> <li>• To get the knowledge on agrochemicals, their type and role in agriculture.</li> <li>• To know about the basics of Fungicides, Insecticides and Fertilizers.</li> </ul>
8.	AU. Agron. 358	Practical Crop Production -I (Kharif Crops)	<ul style="list-style-type: none"> <li>• Each student will be allotted a minimum land area of 10 cents and he will do all field operations in the allotted land from field preparation to harvest and processing.</li> <li>• Under exigencies like water scarcity to raise wetland rice of the crop production programme shall be with two irrigated dry crops, with an area of not less than five cents.</li> <li>• Irrigated puddled lowland rice will be cultivated.</li> </ul>
9.	AU. Agron. 359	Geoinformatics and Nano-technology for Precision Farming	<ul style="list-style-type: none"> <li>• Students will know about applications of GIS in agriculture which will help them to forecast for precision farming.</li> </ul>
10	AU. Agron. 3510	Weed Management	<ul style="list-style-type: none"> <li>• Students will get knowledge on different weeds associated with different crops.</li> <li>• To get knowledge on different weed management practices.</li> </ul>
11	AU. Agron. 3611	Practical Crop Production -II (Rabi Crops)	<ul style="list-style-type: none"> <li>• Each student will be allotted a minimum land area of 10 cents and he will do all field operations in the allotted land from field preparation to harvest and processing.</li> </ul>

			<ul style="list-style-type: none"> <li>• The dryland crops like sunflower, gingelly etc., or the garden land crops like maize, finger millet etc., will be cultivated.</li> </ul>	
12	AU. 3612	Agron.	Principles of Organic Farming	<ul style="list-style-type: none"> <li>• Students get to know about the organic farming practices and procedure for obtaining organic certificates.</li> </ul>
13	AU. 3613	Agron.	Rainfed Agriculture and Watershed Management	<ul style="list-style-type: none"> <li>• Student will study about rainfed agriculture which is predominant in all over India and develop watersheds to manage agricultural practices during off-season.</li> </ul>
14	AU. 3614	Agron.	System Simulation and Agro-advisory	<ul style="list-style-type: none"> <li>• To know the System Approach for representing soil-plant-atmospheric continuum.</li> <li>• Students will know about evaluation of crop responses to weather elements</li> </ul>

**Course outcome of Agronomy**  
**According to 4<sup>th</sup> Deans' Committee**

<b>Sr. No.</b>	<b>Course outline</b>	<b>Topic</b>	<b>Course outcome</b>
1.	AU. Agron. 111	Principle of Agronomy and Agricultural meteorology	<ul style="list-style-type: none"> <li>• To know the basics of the agriculture, tillage.</li> <li>• To learn different metrological parameters like rainfall, temperature, RH and other weather parameters.</li> <li>• To make short-range and long-range weather forecasts.</li> </ul>
2.	AU. Agron. 112	Introductory Agriculture (Ancient Heritage, Agriculture Scenario and Gender Equality in Agriculture)	<ul style="list-style-type: none"> <li>• To know the basics of the agriculture, tillage and evolution of agriculture from different periods from veda to modern agriculture.</li> </ul>
3.	AU. Agron. 123	Water Management including Micro-Irrigation	<ul style="list-style-type: none"> <li>• To know the basics of Irrigation scheduling, System and Methods of irrigation.</li> <li>• Find out the quantity and quality of irrigation water, WUE, factors affecting W.U.E. and agronomic techniques to boost W.U.E.</li> <li>• Outline the elementary idea of drainage and its importance, causes and methods.</li> </ul>
4.	AU. Agron. 124	Practical Crop Production	<ul style="list-style-type: none"> <li>• To impart practical knowledge on various cultivation practices on different season crops.</li> </ul>
5.	AU. Agron. 235	Field Crops-I (Kharif)	<ul style="list-style-type: none"> <li>• To impart knowledge on various cultivation practices of different Kharif crops</li> </ul>

6.	AU. 236	Agron.	Farming System and Sustainable Agriculture	<ul style="list-style-type: none"> <li>• Students will know different cropping and farming system like integrated farming system (IFS).</li> <li>• To get knowledge on sustainable agricultural practices such as organic farming.</li> </ul>
7.	AU. 247	Agron.	Field Crops-II (Rabi)	<ul style="list-style-type: none"> <li>• Students will get knowledge on crop production technologies of different Rabi crops.</li> </ul>
8.	AU. 358	Agron.	Weed Management	<ul style="list-style-type: none"> <li>• Students will get knowledge on different weeds associated with different crops.</li> <li>• To get knowledge on different weed management practices.</li> </ul>
9.	AU. 359	Agron.	Practical Crop Production -I (Kharif Crops)	<ul style="list-style-type: none"> <li>• Each student will be allotted a minimum land area of 10 cents and he will do all field operations in the allotted land from field preparation to harvest and processing.</li> <li>• Under exigencies like water scarcity to raise wetland rice of the crop production programme shall be with two irrigated dry crops, with an area of not less than five cents.</li> <li>• Irrigated puddled lowland rice will be cultivated.</li> </ul>

10.	AU. Agron. 3610	Practical Crop Production -II (Rabi Crops)	<ul style="list-style-type: none"> <li>• Each student will be allotted a minimum land area of 10 cents and he will do all field operations in the allotted land from field preparation to harvest and processing.</li> <li>• The dryland crops like sunflower, etc., or the garden land crops like maize, finger millet etc., will be cultivated.</li> </ul>
11.	AU. Agron. 3611	Organic Farming	<ul style="list-style-type: none"> <li>• Students get to know about the organic farming practices and procedure for obtaining organic certificates.</li> </ul>
12.	AU. Cr. Prod. 4712 (Agron)	Integrated Farming System	<ul style="list-style-type: none"> <li>• Students get to know about the Integrated Farming System and about its importance.</li> <li>• Student will prepare an IFS model to the location specific.</li> </ul>

**Programme outcome of Agronomy  
According to 5<sup>th</sup> Deans' Committee**

- To provide the sound knowledge in the Agriculture required to solve common problems in management of crop cultivation.
- Develop the skills to manage agricultural farms, enhance quality of farm produces and their commercial utilization.
- How to operate the agricultural tools in the field.
- Identify the different agricultural tools, fertilizers, seeds and weeds.
- Get knowledge for differentiate the fertilizers and organic manures.
- Develop the understanding of the relationship between weather variables and agricultural crops.
- Students develop knowledge of principles of organic farming in context of improving human health and amelioration of the environment.
- Understand all related methods in agriculture to increase the profit from crop fields.
- Acquaint the knowledge on different Kharif, Rabi and Zaid season crops, its classification (cereal crops, oilseed crops, pulse crops, cash crops, fodder crops) and its importance in Indian economy.

**Programme outcome of Agronomy  
According to 4<sup>th</sup> Deans' Committee**

- To provide the sound knowledge in the Agriculture required to solve common problems in management of crop cultivation.
- Develop the skills to manage agricultural farms, enhance quality of farm produces and their commercial utilization.
- Operate the agricultural tools in the field.
- Identify the different agricultural tools, fertilizers, seeds, and weeds.
- Get knowledge for differentiate the fertilizers, manure.
- Develop the understanding of the relationship between weather variables and agriculture.
- Students develop knowledge of principles of organic farming in context of improving human health and amelioration of the environment.
- Understand all related methods in agriculture to increase the profit from crop fields.
- Acquaint the knowledge on different Kharif, Rabi and Zaid season crops, its classification (cereal crops ,oilseed crops, pulse crops, sugar crops, fodder crops) and its importance in agriculture and national economy.

**Programme and Course outline of Crop Physiology**  
**According to 4<sup>th</sup> Dean Committee**

SR. NO.	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
1	AU.Crop Physiol.241	Crop Physiology	<ul style="list-style-type: none"> <li>❖ Role of crop physiology in crop health.</li> <li>❖ Identification of deficiency symptoms of nutrients.</li> <li>❖ To understand the metabolic and synthetic pathway of biomolecules.</li> <li>❖ To know the difference between C3, C4 and CAM plant.</li> <li>❖ Importance of growth Harmon in Agriculture.</li> </ul>

**According to 5<sup>th</sup> Dean Committee**

SR. NO.	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
1	AU.Crop Physiol.121	Fundamentals of Crop Physiology	<ul style="list-style-type: none"> <li>❖ To impart basic knowledge on various functions and processes related to crop production, mineral nutrition, plant growth regulators and environmental stresses.</li> <li>❖ Students will come to know the various functions and processes related to crop production, mineral nutrition, plant growth regulators and environmental stresses</li> </ul>
2.	AU. Bio.111	Introductory biology	<ul style="list-style-type: none"> <li>❖ The student will be able to read, understand, and critically interpret the primary biological literature in his/her area of interest.</li> <li>❖ The student will be able to design, conduct, analyze, and communicate (in writing and orally) biological research.</li> <li>❖ The student will recognize and be able to apply basic ethical principles to basic and applied biological/biomedical practice and will understand the role of biological/biomedical science, scientists, and practitioners in society.</li> <li>❖ The student will be able to explain the process of organic evolution and its underlying principles and mechanisms.</li> <li>❖ The student will be able to explain the fundamental biological processes of metabolism, homeostasis, reproduction, development, and genetics, and the relationships between form and function of biological structures at the molecular, cellular, organismal, population, and ecosystem levels of the biological hierarchy. 6. The student will</li> </ul>



			be able to explain the importance of biodiversity at the genetic, organismal, community, and global scales.
<b>3.</b>	<b>AU.FOREST.111</b>	<b>Introduction to forestry</b>	<ul style="list-style-type: none"> <li>❖ To impart knowledge about the basic facts of Forestry as well as agroforestry and familiarize the students with important trees suitable for agroforestry and various agroforestry systems.</li> <li>❖ The students will learn about the silviculture and nursery technology of important agroforestry tree species.</li> </ul>

## M.Sc. ENTOMOLOGY

<b>S.NO.</b>	<b>Course code</b>	<b>Course name</b>	<b>Course outcomes</b>
<b>1.</b>	<b>AUEnto501*</b>	<b>INSECT MORPHOLOGY (1+1)</b>	<p>1. Gained the knowledge about the external morphology of the insect body and their appendages and functions.</p> <p>2. Acquired the knowledge to understand the various modification and adaptations such as head, legs, wings, antennae, mouthparts, abdomen, sense organs.</p>
<b>2.</b>	<b>AUEnto502*</b>	<b>INSECT ANATOMY, PHYSIOLOGY AND NUTRITION (2+1)</b>	<p>1. Developed a sound knowledge on basic aspects of anatomy of different systems, elementary physiology, nutritional physiology and their application in entomology.</p> <p>2. Gained hands-on-training on the different internal systems like digestive system, circulatory system, reproductive system and nervous system.</p> <p>3. Known the different types of system and their modifications in insects.</p> <p>4. Understand the different types of nutrition and diet</p>
<b>3.</b>	<b>AUEnto 503</b>	<b>PRINCIPLES OF TAXONOMY (2+0)</b>	<p>1. Trained in classifying the organisms both theoretically and practically by following the rules</p> <p>2. Learned about taxonomic key and also, they knew how to identify the insects using taxonomic keys.</p>
<b>4.</b>	<b>AUEnto 504*</b>	<b>CLASSIFICATION OF INSECTS (2+1)</b>	<p>1. Gained the knowledge about the classification of arthropods and hierarchical classification.</p> <p>2. Easily identify the different orders of insect.</p> <p>3. For pest control first they know the insect's identification, by studying this they known about different order, family and species of the insects.</p>
<b>s5.</b>	<b>AUEnto 505*</b>	<b>INSECT ECOLOGY (1+1)</b>	<p>1. Acquired the knowledge to understand the concepts of ecology, basic principles of distribution and abundance of organisms and their causes.</p> <p>2. Sampling methods, calculation of diversity indices, constructing life tables</p>
<b>6.</b>	<b>AUEnto 506*</b>	<b>BIOLOGICAL CONTROL OF</b>	<p>1. Acquired the knowledge about theory and practice of biological control,</p>

		<b>CROP PESTS AND WEEDS (1+1)</b>	<p>2. Mass production techniques and field evaluation of various biological control agents like parasitoids, predators and various entomopathogenic microorganisms.</p> <p>3. Familiarized with biological control of weeds using insects.</p>
<b>7.</b>	<b>AUEnto 507</b>	<b>TOXICOLOGY OF INSECTICIDES (2+1)</b>	<p>1. Learned about the structure and mode of action of important insecticides belonging to different groups</p> <p>2. Classification of insecticides pesticide residues, pest resurgence, resistance to insecticides,</p> <p>3. Insecticide dose calculation and some basics about their application</p> <p>4. Safety measures during handling of pesticides and their usages.</p>
<b>8.</b>	<b>AUEnto 508</b>	<b>PLANT RESISTANCE TO INSECTS (1+1)</b>	<p>1. Gained knowledge to understand the types, basis, mechanisms and genetics of resistance in plants to insects and</p> <p>2. Role of plant resistance in pest management and secondary metabolites and their functions in pest management.</p> <p>3. Gained the practical knowledge about the various screening techniques</p> <p>4. Practiced estimation of different mechanism resistance through no choice and multiple-choice techniques.</p>
<b>9.</b>	<b>AUEnto 509*</b>	<b>PRINCIPLES OF INTEGRATED PEST MANAGEMENT (1+1)</b>	<p>1. Knowledge on sampling methods and factors affecting sampling; population estimation methods; crop loss assessment-direct losses, indirect losses, potential losses, avoidable losses, unavoidable losses. Computation of EIL and ETL</p> <p>2. Knowledge about the tools of pest management and their integration legislative, cultural, physical and mechanical methods.</p> <p>3. Familiarization with pest survey and surveillance, forecasting and types of surveys. crop modeling; designing and implementing IPM system.</p>
<b>10.</b>	<b>AuEnto 510*</b>	<b>PESTS OF FIELD CROPS (1+1)</b>	<p>1. Learned about the nature of damage, biology and seasonal incidence of insect pests that cause loss to major field crops</p> <p>2. Effective management by different methods.</p>

			<p>3. Got the clear knowledge about the identification of different insect pest in the field level</p> <p>4. Got awareness of different IPM practices.</p>
<b>11.</b>	<b>AUEnto AU.PL PATH 511/ENT 511</b>	<b>PLANT QUARANTINE (2+0)</b>	<p>1. Obtained the knowledge about the principles and the role of Plant Quarantine in containment of pests and diseases, plant quarantine regulations and set-up.</p> <p>2. Acquired the knowledge about various institution involved in the quarantine regulation, various disinfection methods followed in quarantine station also known about the students.</p>
<b>12.</b>	<b>AUEnto 512*</b>	<b>PESTS OF HORTICULTURA L AND PLANTATION CROPS (1+1)</b>	<p>1. Understanding about the major pests of horticultural and plantation crops regarding the extent and nature of damage.</p> <p>2. Acquired the knowledge about economic losses by pests, biology of various insect pests, seasonal history, their integrated management</p>
<b>13.</b>	<b>AUEnto 513*</b>	<b>TECHNIQUES IN PLANT PROTECTION (0+1)</b>	<p>1. Knowledge about the manufacturing details, principles, operation methodologies of different pest control equipment.</p> <p>2. Acquired the knowledge about protein isolation techniques, tissue culture techniques in plant protection which will create employability.</p>
<b>14.</b>	<b>AUEnto 591*</b>	<b>Masters Seminar</b>	The students can select topic of research on emerging and important issues and present on powerpoint.
<b>15.</b>	<b>AUEnto 599*</b>	<b>Master Research</b>	Students can select a research topic, prepare synopsis and execute the programme as per suitable design

<b>S. NO.</b>	<b>PROGRAM SPECIFIC OUTCOMES</b>
<b>1.</b>	Develop fundamental knowledge on different theories, concepts of basic and applied
	Entomology and gaining detailed knowledge about insects and their usage in agriculture
<b>2.</b>	Creating awareness about how to maximize the utilization of natural resources and skills of teaching, research and extension activities in the field of plant protection
	specialization to entomology.

<b>3.</b>	Capability to implement Different basic and innovative tools of pest management in
	crop field benefiting the farming communities and their commercial use.
<b>4.</b>	Entrepreneurship ability in the commercial field of entomology like bee keeping, sericulture and lac culture.
<b>5.</b>	Skill in practical aspects like pesticide formulation, calculation of dose of specific pesticide as well as skill to handle different instruments in laboratory useful in entomological research

## Programme and course outline of Agriculture Economics

### According to 4 Deans' Committee

Sr. No.	Course outline	Topic	Course Outcome
1	AU. Ag. Econ.111	Principle of Agricultural Economics	In this course students will learn the meaning of Economics and Agricultural Economics, basic concept of demand, utility, national income, inflation, etc.
2	AU. Ag. Econ. 122	Production Economics and Farm Management	Nature and scope of Production Economics and Farm Management studied along with Factor –Product, factor- factor, Product- Product, linear Programming for minimizing the cost and maximizing the profit in the farm.
3	AU. Ag. Econ.233	Agricultural Finance and Co-operation	The course taught about banking and insurance system and functioning of financial institution.
4	AU. Ag. Econ.244	Agricultural Marketing, Trade and Prices	The subject provides basic concept of marketing and ways of reducing marketing cost.
5	AU. Ag. Econ.355	Fundamentals of Farm Business Management ( Including Project Development, Appraisal &Monitoring)	The course gives the knowledge of agribusiness, planning, financial management of agribusiness and marketing management.
6	AU.ABM. 476 (Ag. Econ.)	Management of Agro-Based Industry	The course gives the knowledge of agro-industry, sales promotion strategies and formation of agro industrial project and their technical, economic, financial feasibility
7	AU.ABM. 477 (Ag. Econ.)	Marketing Management (Agricultural Import-Export Policy of Govt. of India & Business Laws)	The subject provides basic concept of marketing management, business law and political system, sale forecasting and marketing information system, India's foreign trade and foreign trade policy, etc.
8	AU.ABM. 478 (Ag. Econ.)	Financial Management of Agri - Business.	The course gives the knowledge of financial management, accounting, budgeting and budgetary control system, etc.
9	AU.ABM. 479 (Ag.	Natural Resources and	The subject provides basic concepts of

	Econ.)	Management	natural resource, major issues in the use, externalities and management of renewable and non- renewable resources.
10	AU.ABM. 471 (Mgn..)	Project Formulation, Evaluation and Monitoring	The course gives the knowledge of basic concepts for selection of agricultural project, project resource management, planning and scheduling, etc.
11	Programme outcome	The contents and subject matter in the programme is so arranged and presented that the undergraduate students can understand the realities and complexities of agriculture production and marketing system, Government policies, establishment of agro-based project and benefit from it, etc.	

Programme and course outline of Agriculture Economics

According to 5<sup>th</sup> Deans' Committee

Sr. No.	Course outline	Topic	Course Outcome
1	AU. Ag. Econ.121	Fundamental of Agricultural Economics	In this course students will learn the meaning of economics, micro & macro economics; basic concept of demand & supply, utility, costs, national income, inflation, economic system, etc.
2	AU. Ag. Econ.232	Agricultural Finance and Co-operation	The course taught about agricultural finance and banking system and functioning of financial and insurance institutions and co-operation, etc.
3	AU. Ag. Econ.243	Agricultural Marketing Trade and prices	The subject provides basic concept of marketing, ways of reducing marketing cost and role of government.
4	AU. Ag. Econ.354	Agricultural – Business Management	The subject provides knowledge transformation of agriculture into agribusiness, linkages between primary and support activities and marketing management.d marketing management.
5	AU. Ag. Econ. 365	Farm Management, Production and Resource Economics	Nature and scope of Production Economics and Farm Management studied along with Factor –Product, factor- factor, Product- Product, linear Programming for minimizing the cost and maximizing the profit in the farm. Risk and uncertainty in agriculture production and natural resource management.
6	Programme outcome	This programme deals with fundamentals of economics, farm management and production economics, agricultural finance and co-operation; agriculture marketing ; agriculture business and natural resource management and price policy; etc.	

(D. R. Thakur)

Dean School of Agriculture



**Programme and course outcome of Horticulture  
According to 4<sup>th</sup> Deans' Committee**

**Course outcome**

<b>Sr. No.</b>	<b>Course outline</b>	<b>Topic</b>	<b>Course outcome</b>
1.	AU. Extn.121	Fundamentals of Rural Sociology & Educational Psychology	<ul style="list-style-type: none"> <li>• The students will be able to acquaint the knowledge on various aspects related to rural society, nature and structure of Indian rural society, social stratification, social institution, cultural concept, meaning and significance of agricultural extension and social groups.</li> <li>• Develop the evaluative thinking on need of soft skills (selfmotivation, learning attitude, positive attitude, aspiring thoughts) while improvising oneself.</li> <li>• Analyzing attitude on rural society, nature and structure of rural society and components of rural society</li> </ul>
2.	AU. Extn.242	Dimensions of Agricultural Extension	<ul style="list-style-type: none"> <li>• The course intends to expose students to the fundamentals of extension education, extension systems in India, programme planning and rural development efforts.</li> <li>• The course will also provide an opportunity to students to visit different organizations involved in extension activities and rural development work.</li> </ul>
3.	AU. Extn.353	Extension Methodologies for Transfer of Agricultural Technology	<ul style="list-style-type: none"> <li>• To impart knowledge on different extension methods and approaches used for transfer of agricultural technology.</li> </ul>
4.	AU. Extn.364	Entrepreneurship Development and Communication Skills	<ul style="list-style-type: none"> <li>• To impart knowledge on different extension methods and approaches used for transfer of agricultural technology.</li> <li>• The course will also enable to develop practical skills on preparation of different extension teaching methods.</li> </ul>

**Programme outcome (PO):**

After completion of the programme the students will be able to:

1. To impart practical based knowledge on agriculture and allied sectors
2. To impart in-depth practical knowledge in rural development
3. To provide hand hold exposure on agriculture -allied sectors like Dairy, Apiculture, Fishery, Poultry science etc.
4. To disseminate different rural technologies through various extension activities

5. To identify and overcome the problems encountered in day-to-day life in agriculture and social sector
6. To provide knowledge on commercial agricultural production practices
7. To make students competitive in pursuing higher studies
8. To get an exposure to a new rural area and the socio-economic condition of people
9. To provide knowledge from ancient to modern agricultural practices
10. To face the rural reality during the rural living and learning experience
11. To impart in-depth practical knowledge in crop cultivation practices
12. To cope with adverse situations during their rural staying at different remote parts of rural area
13. To provide knowledge on working of different farm implements
14. Detailed knowledge on various agri-business activities
15. To build the manpower for serving the rural community
16. To disseminate recent agricultural technologies through extension

**Programme and course outcome of Horticulture  
According to 5<sup>th</sup> Deans' Committee**

**Course outcome**

<b>Sr. No.</b>	<b>Course outline</b>	<b>Topic</b>	<b>Course outcome</b>
1.	AU.Ag.Extn.111	Rural Sociology & Educational Psychology	<ul style="list-style-type: none"> <li>• The students will be able to acquaint the knowledge on various aspects related to rural society, nature and structure of Indian rural society, social stratification, social institution, cultural concept, meaning and significance of agricultural extension and social groups.</li> <li>• Develop the evaluative thinking on need of soft skills (selfmotivation, learning attitude, positive attitude, aspiring thoughts) while improvising oneself.</li> <li>• Analyzing attitude on rural society, nature and structure of rural society and components of rural society</li> </ul>
2.	AU.Ag. Extn.122	Fundamentals of Agricultural Extension Education	<ul style="list-style-type: none"> <li>• The course intends to expose students to the fundamentals of extension education, extension systems in India, programme planning and rural development efforts.</li> <li>• The course will also provide an opportunity to students to visit different organizations involved in extension activities and rural development work</li> </ul>
3.	AU.Ag. Extn.123	Communication Skills and Personality Development	<ul style="list-style-type: none"> <li>• Acquaint the knowledge on Listening, Speaking, Reading and Writing Skills along with classification; General &amp; Technical Article and writing principles of these articles; comparison between Individual &amp; Group presentation; organization of seminars &amp; conferences and formats of Public Speaking</li> <li>• Develop evaluative thinking on variations between General &amp; Technical Articles with the way of writing, how to prepare for public speaking and the principles to be followed and significance of Field</li> </ul>

			Diary & Lab Record for an agriculture student
4.	AU.Ag. Extn.244	Agricultural Journalism	<ul style="list-style-type: none"> <li>• Students will learn principles and professional skills for writing, editing and seminar.</li> <li>• This course also imparts skills on publications production, public relations and internet communications on agriculture.</li> </ul>
5.	AU.Ag. Extn.355	Entrepreneurship Development and Business Communication	<ul style="list-style-type: none"> <li>• To impart knowledge on different extension methods and approaches used for transfer of agricultural technology.</li> <li>• The course will also enable to develop practical skills on preparation of different extension teaching methods.</li> </ul>

**Programme outcome (PO):**

After completion of the programme the students will be able to:

1. To impart practical based knowledge on agriculture and allied sectors
2. To impart in-depth practical knowledge in rural development
3. To provide hand hold exposure on agriculture -allied sectors like Dairy, Apiculture, Fishery, Poultry science etc.
4. To disseminate different rural technologies through various extension activities
5. To identify and overcome the problems encountered in day-to-day life in agriculture and social sector
6. To provide knowledge on commercial agricultural production practices
7. To make students competitive in pursuing higher studies
8. To get an exposure to a new rural area and the socio-economic condition of people
9. To provide knowledge from ancient to modern agricultural practices
10. To face the rural reality during the rural living and learning experience
11. To impart in-depth practical knowledge in crop cultivation practices
12. To cope with adverse situations during their rural staying at different remote parts of rural area
13. To provide knowledge on working of different farm implements
14. Detailed knowledge on various agri-business activities
15. To build the manpower for serving the rural community
16. To disseminate recent agricultural technologies through extension

**Programme and course outcome of Horticulture**  
**According to 5<sup>th</sup> Deans' Committee**

**Course outcome**

<b>Sr. No.</b>	<b>Course outline</b>	<b>Topic</b>	<b>Course outcome</b>
1.	AU. Hort. 111	Fundamentals of Horticulture	<ul style="list-style-type: none"> <li>• Students will gain knowledge on the fundamentals of horticulture</li> <li>• Hands on training on various propagation methods and important cultural practices for major fruit and plantation crops will be provided (Practical)</li> </ul>
2.	AU. Hort. 232	Production Technology for Vegetable and Spices	<ul style="list-style-type: none"> <li>• To impart knowledge on the principles of horticulture, propagation and production techniques of tropical, sub tropical, temperate vegetable and spice crops</li> </ul>
3.	AU. Hort. 243	Production Technology for Fruit and Plantation Crops	<ul style="list-style-type: none"> <li>• To impart knowledge on the principles of horticulture, propagation and production techniques of tropical, sub tropical, temperate fruit and plantation crops.</li> <li>• Students will be imparted with wide knowledge on major tropical, sub-tropical and temperate fruit and plantation crops.</li> <li>• Hands on training on various propagation methods and important cultural practices for major fruit and plantation crops will be provided</li> </ul>
4.	AU. Hort. 244	Production Technology for Ornamental Crops, MAP and Landscaping	<ul style="list-style-type: none"> <li>• Students will learn different production technology for ornamental Crops,</li> <li>• To learn the techniques in Landscaping</li> </ul>
5.	AU. Hort. 366	Post-harvest Management and Value Addition of Fruit and Vegetables	<ul style="list-style-type: none"> <li>• Students will get to know about different processing techniques of fruits and vegetable crops and they make value added products like jam, jelly, squash, juice etc</li> </ul>
6.	AU. Hort. 367	Micro-propagation Technologies	<ul style="list-style-type: none"> <li>• Study about tissue culture methods and applications extensively studied with application point of view. Production of viral free planting material by meristematic tissue</li> </ul>
7.	AU. Hort. 368	Hi-tech Horticulture	<ul style="list-style-type: none"> <li>• Student will get to know about farming technology to increase yields, ensures high quality.</li> <li>• Student will also learn about growing temperate vegetables in a tropical climate and developing disease-resistant plants through genetic engineering.</li> </ul>

**Programme outcome (PO):**

After completion of the programme the students will be able to:

1. Transfer knowledge of Horticulture in the field of agricultural research especially in horticulture including fruits, vegetables, flowers, spices, medicinal and aromatic plants and their management.
2. Develop innovative agro- techniques to enhance the production and productivity of horticultural crops.
3. Increase farmers' income through adopting hi-tech horticulture.
4. Create job opportunities for the unemployed youths through teaching, research, training, extension etc., especially for the development of socially and economically depressed segment of society.
5. Establishment of models nurseries in rural areas for availability of quality planting materials.
6. Conservation and exploitation of biological diversity through crop management.
7. Prolong the post harvest storage life of horticultural commodities and increase income through value addition of the products and to reduce post harvest losses.

**Programme and course outcome of Horticulture  
According to 4<sup>th</sup> Deans' Committee**

**Course outcome**

<b>Sr. No.</b>	<b>Course outline</b>	<b>Topic</b>	<b>Course outcome</b>
1.	AU. Hort. 351	Production Technology of fruit crops	<ul style="list-style-type: none"> <li>• Impart basic knowledge about the importance and management of temperate fruits grown in India.</li> <li>• Study of commercial varieties of regional, national and international importance, ecophysiological requirements, recent trends in propagation, rootstock influence, planting system, cropping systems, root zone and canopy management, nutrient management, water management, fruit set and development, abiotic factors limiting fruit production, physiological of flowering, and remedies, quality improvement by management practices; maturity indices, harvesting, grading, packing, precooling, storage, transportation and ripening techniques.</li> </ul>
2.	AU. Hort. 362	Production Technology of Spices, Aromatic, Medicinal and Plantation Crops	<ul style="list-style-type: none"> <li>• Impart comprehensive knowledge about the production technology of medicinal and aromatic crops.</li> <li>• To impart knowledge on the principles of horticulture, propagation and production techniques of tropical, sub tropical, temperate spice crops</li> <li>• Study of Herbal industry, Indian system of medicine, indigenous Traditional Knowledge, IPR issues, Classification of medicinal crops, Systems of cultivation, Organic Production, Role of institutions and NGO's in production, GAP in medicinal crops production.</li> <li>• Knowledge of production technology for Aromatic, Medicinal and Plantation Crops</li> </ul>
3.	AU. Hort. 363	Post-harvest Management and Value Addition of Fruit and Vegetables	<ul style="list-style-type: none"> <li>• Students will get to know about different processing techniques of fruits and vegetable crops and they make value added products like jam, jelly, squash, juice etc</li> </ul>
4.	AU. Hort. 474	Commercial Fruit Production	<ul style="list-style-type: none"> <li>• Students will learn different production technology for fruit Crops to gain</li> </ul>

			<p>higher productivity for marketing</p> <ul style="list-style-type: none"> <li>• learn about economic and nutritional advantages</li> </ul>
5.	AU. Hort. 475	Nursery management for horticultural crops	<ul style="list-style-type: none"> <li>• Familiarization with principles and practices of nursery management for Horticultural Crops.</li> <li>• Knowledge of nursery management, nursery establishment and nursery rules and regulation.</li> </ul>
6.	AU. Hort. 476	Processing and value-addition of horticultural crops	<ul style="list-style-type: none"> <li>• Students will get to know about different processing techniques of horticultural crops and they make value added products like jam, jelly, squash, juice etc</li> </ul>
7.	AU.Hort. 473	Commercial Floriculture	<ul style="list-style-type: none"> <li>• Students will learn different production technology of flowers for commercial production and marketing</li> </ul>
8.	AU.Hort. 474	Protected Cultivation of Horticultural Crops and Seed Production of Vegetables and Flowers	<ul style="list-style-type: none"> <li>• Students will produce different horticultural Crops under poly house/protected cultivation</li> <li>• Educate principles and methods of quality seed and planting material production in and vegetables and flowers.</li> <li>• Definition of seed and its quality, new seed policies; DUS test, scope of vegetable seed industry in India.</li> <li>• Genetical and agronomical principles of seed production; methods of seed production; use of growth regulators and chemicals in vegetable and flowers seed production; floral biology, pollination, breeding behaviour, seed development and maturation; methods of hybrid seed production.</li> </ul>

**Programme outcome (PO):**

After completion of the programme the students will be able to:

1. Transfer knowledge of Horticulture in the field of agricultural research especially in horticulture including fruits, vegetables, flowers, spices, medicinal and aromatic plants and their management.
2. Develop innovative agro- techniques to enhance the production and productivity of horticultural crops.
3. Increase farmers' income through adopting hi-tech horticulture
4. Create job opportunities for the unemployed youths through teaching, research, training, extension etc., especially for the development of socially and economically depressed segment of society.



5. Establishment of models nurseries in rural areas for availability of quality planting materials.
6. Conservation and exploitation of biological diversity through crop management.
7. Prolong the post harvest storage life of horticultural commodities and increase income through value addition of the products and to reduce post harvest losses.

Course out come and Programme outcome (Floriculture+Environemtn + IPR)

COURSE CODE	COURSE TITLE	SEMESTER	COURSE OUTCOME	Programme outcome
<b>• FLORICULTURE</b>				
AU.VSF. 231 3 (2+1)	Production Technology of Vegetables and Flowers	III	<ul style="list-style-type: none"> <li>analyze production technology of different ornamentals</li> <li>examine ornamental garden and its planning</li> <li>raising of plants and their maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Thorough knowledge of the ornamental horticulture will make students well versed with the ornamental crops and its use in development of a landscape</li> </ul>
AU.HORT 245 3 (2+1) Elective	Landscaping	IV	<ul style="list-style-type: none"> <li>planning of gardens and its commercialization</li> <li>cultivation of various ornamentals</li> <li>developing landscape plan for bio aesthetic planning of rural and urban areas</li> </ul>	
<b>• ENVIRONMENTAL SCIENCES</b>				
AU. Env. 361 2(1+1)	Environmental Science	IV	<ul style="list-style-type: none"> <li>examine various ecosystems</li> <li>apply knowledge of natural resources for environment conservation</li> <li>observe several case studies of environmental pollution</li> </ul>	<ul style="list-style-type: none"> <li>knowledge of environment make students aware and active in identifying problems associated with recourse use and degradatio</li> </ul>
AU. ENV.	Environmental	III	<ul style="list-style-type: none"> <li>Knowledge of</li> </ul>	

DM. 231	sciences and disaster management		<p>scarcity and sustainable use of natural resources</p> <ul style="list-style-type: none"> <li>• Examine the biodiversity and its conservation</li> <li>• Apply knowledge to prevent any disaster</li> </ul>	n of environment as well as finding solution
<b>• FOOD TECHNOLOGY</b>				
AU. FSN 262 2 (2+0)	Principles of food science and nutrition	VI	<ul style="list-style-type: none"> <li>• examine foods and its type based on nutrition</li> <li>• apply knowledge of food chemistry in diet planning</li> <li>• observe food composition for a balanced diet</li> </ul>	<ul style="list-style-type: none"> <li>• student will have a knowledge of proper and balanced diet and the impact it has on human health</li> </ul>
<b>• SOCIAL SCIENCES</b>				
AU.HVE.111 1(1+0)	Human Value and Ethics	I	<ul style="list-style-type: none"> <li>• self exploration of principles and philosophy of life</li> <li>• knowledge of self motivation and ethics</li> <li>• awareness of body mind and soul</li> </ul>	<ul style="list-style-type: none"> <li>• Students appreciation and motivation to set a goal in life</li> </ul>
AU.IPR.351 1(1+0)	Intellectual Property Rights	V	<ul style="list-style-type: none"> <li>• Examine various IPRs in India</li> <li>• Importance of IPR in agricultural inventions</li> <li>• Use of IPR in protection and commercialization of</li> </ul>	<ul style="list-style-type: none"> <li>• Students made aware of their rights as an innovator as well as how to utilize these rights</li> </ul>

			agricultural produce	
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## Programme and course outline of Soil Science

### According to 4<sup>th</sup> Dean's Committee

Sr. No	Course outline	Topic	Course Outcome
1.	AU. Soils 111	Introduction to Soil Science	<b>Student will be able to understand: To be able about physical and chemical properties of soil and their effect on plant health.</b>
2	AU. Soils 122	Soil Chemistry, Soil Fertility and Nutrient Management	<b>To understand essentiality of plant nutrient and mechanism of nutrient transport to plant and factor affecting nutrient availability.</b>
3	AU. Soils 233	Manure, Fertilizers and agro-chemicals	<b>Knowledge of different manure and fertilizers used in different crops according to soil condition.</b>
4	AU. Cr. Prod. Soils 474	Water management	<b>Student will be acquainted about different approaches of water management.</b>
5	AU. Cr. Prod. Soils 475	Soil Management	<b>To understand different factors responsible for saline, sodic and acidic soils and their properties.</b>
<b>According to 5<sup>th</sup> Dean's Committee</b>			
1	AU. Soils 111	Introduction to Soil Science	<b>Knowledge about soil forming rocks and mineral, their weathering and soil forming process and climate factors affect them.</b>
2.	AU. Soils. 242	Problematic soils and their management	<b>To provide knowledge about waste land and problematic soils in India and management of the soils.</b>
3.	AU. Soils. 353	Manures, Fertilizers and Soil Fertility Management	<b>To understand different sources responsible for Manure and fertilizers.</b>

**Overall Course Programme outcome:**

**At the end of the course, student will able to understand:**

To be able about procedure of soil testing and establish soil testing laboratory in future as a entrepreneur.

To aware the students about causes, effect and remedies to prevention and mitigation of soil pollution.

# SCHOOL OF PHARMACY

**Programme Outcomes (POs), Programme Specific Outcomes (PSOs)**

**& Course Outcomes (COs)**

## **Programme Outcomes (POs)**

**POs-1: Pharmacy Knowledge:** Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; and manufacturing practices.

**POs-2: Planning Abilities:** Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.

**POs-3: Problem analysis:** Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.

**POs-4: Modern tool usage:** Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.

**POs-5: Leadership skills:** Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and

societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and well-being.

**POs-6: Professional Identity:** Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).

**POs-7: Pharmaceutical Ethics:** Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.

**POs-8: Communication:** Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.

**POs-9: The Pharmacist and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.

**POs-10: Environment and sustainability:** Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**POs-11: 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. Self-assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

### **Programme Specific Outcomes (PSOs)**

**PSO-1:** To prepare graduate to success in technical or professional careers in various pharmaceutical industry and/ or institute and /or Health care system through excellent real time exposure to rigorous education.

**PSO-2:** To prepare graduate of the program to learn and adapt in a globe of constantly developing trends

**PSO-3:** To prepare the graduate to have foundation in science, formulation technology, synthetic knowledge, Discovery tools as per the requirement of Pharmaceutical sectors.

**PSO-4:** To strengthen the professional and ethical attitude, effective communication skills, teamwork skills, multidisciplinary approach, and an ability to relate pharmaceutical sciences issues to broader social context.

**PSO-5:** To streams a lifelong career of personal and practicing professional growth with ethical codes and self esteem



## **Course Outcomes (COs)**

### **AUBP101T. Human anatomy and physiology-i**

**COs-1:** Explain the gross morphology, structure and functions of various organs of the human body.

**COs-2:** Describe the various homeostatic mechanisms and their imbalances.

**COs-3:** Identify the various tissues and organs of different systems of human body.

**COs-4:** Perform the various experiments related to special senses and nervous system.

**COs-5:** Appreciate coordinated working pattern of different organs of each system

### **AUBP102T. PHARMACEUTICAL ANALYSIS**

**COs-1:** Understand the principles of volumetric and electro chemical analysis

**COs-2:** Carryout various volumetric and electrochemical titrationsdevelop analytical skills

### **AUBP103T. PHARMACEUTICS- I**

**COs-1:** Know the history of profession of pharmacy

**COs-2:** Understand the basics of different dosage forms, pharmaceutical incompatibilities andpharmaceutical calculations

**COs-3:** Understand the professional way of handling the prescription

**COs-4:** Preparation of various conventional dosage forms

### **AUBP104T. PHARMACEUTICAL INORGANIC CHEMISTRY**

**COs-1:** Know the sources of impurities and methods to determine the impurities ininorganic drugs and pharmaceuticals

**COs-2:** understand the medicinal and pharmaceutical importance of inorganic compounds

### **AUBP105T: COMMUNICATION SKILLS**

**COs-1:** Understand the behavioral needs for a Pharmacist to function effectively in theareas of pharmaceutical operation

**COs-2:** Communicate effectively (Verbal and Non Verbal)

**COs-3:** Effectively manage the team as a team player

**COs-4:** Develop interview skills

**COs-5:** Develop Leadership qualities and essentials

### **AUBP 106RBT: Remedial Biology**

**COs-1:** know the classification and salient features of five kingdoms of life

**COs-2:** understand the basic components of anatomy & physiology of plant

**COs-3:** know understand the basic components of anatomy & physiology animal with special reference to human

#### **AUBP 106RMT: Remedial Mathematics**

**COs-1:** Know the theory and their application in Pharmacy

**COs-2:** Solve the different types of problems by applying theory

**COs-3:** Appreciate the important application of mathematics in Pharmacy

#### **AUBP 201T: HUMAN ANATOMY AND PHYSIOLOGY-II**

**COs-1:** Explain the gross morphology, structure and functions of various organs of the human body.

**COs-2:** Describe the various homeostatic mechanisms and their imbalances.

**COs-3:** Identify the various tissues and organs of different systems of human body.

**COs-4:** Perform the hematological tests like blood cell counts, haemoglobin estimation, bleeding/clotting time etc and also record blood pressure, heart rate, pulse and respiratory volume.

**COs-5:** Appreciate coordinated working pattern of different organs of each system

**COs-6:** Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body.

#### **AUBP202T: PHARMACEUTICAL ORGANIC CHEMISTRY –I**

**COs-1:** write the structure, name and the type of isomerism of the organic compound

**COs-2:** write the reaction, name the reaction and orientation of reactions

**COs-3:** account for reactivity/stability of compounds,

**COs-4:** identify/confirm the identification of organic compound

#### **AUBP203 T: BIOCHEMISTRY**

**COs-1:** Understand the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes.

**COs-2:** Understand the metabolism of nutrient molecules in physiological and pathological conditions.

**COs-3:** Understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins.

#### **AUBP 204T: PATHOPHYSIOLOGY**

**COs-1:** Describe the etiology and pathogenesis of the selected disease states;

**COs-2:** Name the signs and symptoms of the diseases; and

**COs-3:** Mention the complications of the diseases.

#### **AUBP205 T: COMPUTER APPLICATIONS IN PHARMACY**

**COs-1:** know the various types of application of computers in pharmacy

**COs-2:** know the various types of databases

**COs-3:** know the various applications of databases in pharmacy

### **AUBP 206 T: ENVIRONMENTAL SCIENCES**

**COs-1:** Create the awareness about environmental problems among learners.

**COs-2:** Impart basic knowledge about the environment and its allied problems.

**COs-3:** Develop an attitude of concern for the environment.

**COs-4:** Motivate learner to participate in environment protection and environment improvement.

**COs-5:** Acquire skills to help the concerned individuals in identifying and solving environmental problems.

**COs-6:** Strive to attain harmony with Nature.

### **AUBP301T: PHARMACEUTICAL ORGANIC CHEMISTRY –II**

**COs-1:** Write the structure, name and the type of isomerism of the organic compound

**COs-2:** Write the reaction, name the reaction and orientation of reactions

**COs-3:** Account for reactivity/stability of compounds,

**COs-4:** Prepare organic compounds

### **AUBP302T: PHYSICAL PHARMACEUTICS-I**

**COs-1:** Understand various physicochemical properties of drug molecules in the designing the dosage forms

**COs-2:** Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations

**COs-3:** Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms.

### **AUBP 303 T: PHARMACEUTICAL MICROBIOLOGY**

**COs-1:** Understand methods of identification, cultivation and preservation of various microorganisms

**COs-2:** To understand the importance and implementation of sterilization in pharmaceutical processing and industry

**COs-4:** Learn sterility testing of pharmaceutical products.

**COs-5:** Carried out microbiological standardization of Pharmaceuticals.

**COs-6:** Understand the cell culture technology and its applications in pharmaceutical industries.

### **AUBP 304 T. PHARMACEUTICAL ENGINEERING**

**COs-1:** To know various unit operations used in Pharmaceutical industries.

**COs-2:** To understand the material handling techniques.

**COs-3:** To perform various processes involved in pharmaceutical manufacturing process.

**COs-4:** To carry out various test to prevent environmental pollution.

**COs-5:** To appreciate and comprehend significance of plant lay out design for optimum use of resources.

**COs-6:** To appreciate the various preventive methods used for corrosion control in Pharmaceutical industries

### **AUBP401T. PHARMACEUTICAL ORGANIC CHEMISTRY –III**

**COs-1:** Understand the methods of preparation and properties of organic compounds

**COs-2:** Explain the stereo chemical aspects of organic compounds and stereo chemical reactions

**COs-3:** Know the medicinal uses and other applications of organic compounds

### **AUBP402T. MEDICINAL CHEMISTRY – I**

**COs-1:** Understand the chemistry of drugs with respect to their pharmacological activity

**COs-2:** Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs

**COs-3:** Know the Structural Activity Relationship (SAR) of different class of drugs

**COs-4:** Write the chemical synthesis of some drugs

### **AUBP 403 T. PHYSICAL PHARMACEUTICS-II**

**COs-1:** Understand various physicochemical properties of drug molecules in the designing the dosage forms

**COs-2:** Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations

**COs-3:** Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms.

### **AUBP 404 T. PHARMACOLOGY-I**

**COs-1:** Understand the pharmacological actions of different categories of drugs

**COs-2:** Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels.

**COs-3:** Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.

**COs-4:** Observe the effect of drugs on animals by simulated experiments

**COs-5:** Appreciate correlation of pharmacology with other bio medical sciences

### **AUBP 405 T. PHARMACOGNOSY AND PHYTOCHEMISTRY I**

**COs-1:** To know the techniques in the cultivation and production of crude drugs

**COs-2:** To know the crude drugs, their uses and chemical nature

**COs-3:** Know the evaluation techniques for the herbal drugs

**COs-4:** To carry out the microscopic and morphological evaluation of crude drugs

### **AUBP501T. MEDICINAL CHEMISTRY – II**

**COs-1:** Understand the chemistry of drugs with respect to their pharmacological activity

**COs-2:** Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs

**COs-3:** Know the Structural Activity Relationship of different class of drugs

**COs-4:** Study the chemical synthesis of selected drugs

#### **AUBP 502 T: Industrial Pharmacy-I**

**COs-1:** Know the various pharmaceutical dosage forms and their manufacturing techniques.

**COs-2:** Know various considerations in development of pharmaceutical dosage forms

**COs-3:** Formulate solid, liquid and semisolid dosage forms and evaluate them for their Quality

#### **AUBP503.T: PHARMACOLOGY-II**

**COs-1:** Understand the mechanism of drug action and its relevance in the treatment of different diseases

**COs-2:** Demonstrate isolation of different organs/tissues from the laboratory animals by simulated experiments

**COs-3:** Demonstrate the various receptor actions using isolated tissue preparation

**COs-4:** Appreciate correlation of pharmacology with related medical sciences

#### **AUBP504 T. PHARMACOGNOSY AND PHYTOCHEMISTRY II**

**COs-1:** To know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents

**COs-2:** To understand the preparation and development of herbal formulation.

**COs-3:** To understand the herbal drug interactions

**COs-4:** To carry out isolation and identification of phytoconstituents

#### **AUBP 505 T. PHARMACEUTICAL JURISPRUDENCE**

**COs-1:** The Pharmaceutical legislations and their implications in the development and Marketing of pharmaceuticals.

**COs-2:** Various Indian pharmaceutical Acts and Laws

**COs-3:** The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals

**COs-4:** The code of ethics during the pharmaceutical practice

#### **AUBP601T. MEDICINAL CHEMISTRY – III**

**COs-1:** Understand the importance of drug design and different techniques of drug design.

**COs-2:** Understand the chemistry of drugs with respect to their biological activity.

**COs-3:** Know the metabolism, adverse effects and therapeutic value of drugs.

**COs-4:** Know the importance of SAR of drugs.

#### **AUBP602 T. PHARMACOLOGY-III**

**COs-1:** Understand the mechanism of drug action and its relevance in the treatment of different infectious diseases

**COs-2:** Comprehend the principles of toxicology and treatment of various poisonings and appreciate correlation of pharmacology with related medical sciences.

#### **AUBP 603 T. HERBAL DRUG TECHNOLOGY**

**COs-1:** Understand raw material as source of herbal drugs from cultivation to herbal drug product

**COs-2:** Know the WHO and ICH guidelines for evaluation of herbal drugs

**COs-3:** Know the herbal cosmetics, natural sweeteners, nutraceuticals

**COs-4:** Appreciate patenting of herbal drugs, GMP .

#### **AUBP 604 T. BIOPHARMACEUTICS AND PHARMACOKINETICS**

**COs-1:** Understand the basic concepts in biopharmaceutics and pharmacokinetics and their significance.

**COs-2:** Use of plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism, excretion, elimination.

**COs-3:** To understand the concepts of bioavailability and bioequivalence of drug products and their significance.

**COs-4:** Understand various pharmacokinetic parameters, their significance & applications.

#### **AUBP 605 T. PHARMACEUTICAL BIOTECHNOLOGY**

**COs-1:** Understanding the importance of Immobilized enzymes in Pharmaceutical Industries

**COs-2:** Genetic engineering applications in relation to production of pharmaceuticals

**COs-3:** Importance of Monoclonal antibodies in Industries

**COs-4:** Appreciate the use of microorganisms in fermentation technology

#### **AUBP 606: T. PHARMACEUTICAL QUALITY ASSURANCE**

**COs-1:** Understand the cGMP aspects in a pharmaceutical industry

**COs-2:** Appreciate the importance of documentation

**COs-3:** Understand the scope of quality certifications applicable to pharmaceutical Industries

**COs-4:** Understand the responsibilities of QA & QC departments

#### **AUBP 701 T: INSTRUMENTAL METHODS OF ANALYSIS**

**COs-1:** Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis

**COs-2:** Understand the chromatographic separation and analysis of drugs.

**COs-3:** Perform quantitative & qualitative analysis of drugs using various analytical instruments.

#### **AUBP 702 T. INDUSTRIAL PHARMACY-II**

**COs-1:** Know the process of pilot plant and scale up of pharmaceutical dosage forms

**COs-2:** Understand the process of technology transfer from lab scale to commercial batch

**COs-3:** Know different Laws and Acts that regulate pharmaceutical industry

**COs-4:** Understand the approval process and regulatory requirements for drug products

#### **AUBP 703T: PHARMACY PRACTICE**

**COs-1:** Know various drug distribution methods in a hospital

**COs-2:** Appreciate the pharmacy stores management and inventory control

**COs-3:** Monitor drug therapy of patient through medication chart review and clinical review

**COs-4:** Obtain medication history interview and counsel the patients

**COs-5:** Identify drug related problems

**COs-6:** Detect and assess adverse drug reactions

**COs-7:** Interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states

**COs-8:** Know pharmaceutical care services

**COs-9:** Do patient counselling in community pharmacy;

**COs-10:** Appreciate the concept of Rational drug therapy.

#### **AUBP 704T: NOVEL DRUG DELIVERY SYSTEMS**

**COs-1:** To understand various approaches for development of novel drug delivery systems.

**COs-2:** To understand the criteria for selection of drugs and polymers for the development of Novel drug delivery systems, their formulation and evaluation

#### **AUBP801T: BIostatistics AND RESEARCH METHODOLOGY**

**COs-1:** Know the operation of M.S. Excel, SPSS, R and MINITAB®, DoE (Design of Experiment)

**COs-2:** Know the various statistical techniques to solve statistical problems

**COs-3:** Appreciate statistical techniques in solving the problems.

#### **AUBP 802T SOCIAL AND PREVENTIVE PHARMACY**

**COs-1:** Acquire high consciousness/realization of current issues related to health and pharmaceutical problems within the country and worldwide.

**COs-2:** Have a critical way of thinking based on current healthcare development.

**COs-3:** Evaluate alternative ways of solving problems related to health and pharmaceutical issues

#### **AUBP803ET. PHARMA MARKETING MANAGEMENT**

**COs-1:** Understanding of marketing concepts and techniques and their applications in the pharmaceutical industry.

#### **AUBP804 ET: PHARMACEUTICAL REGULATORY SCIENCE**

**COs-1:** Know about the process of drug discovery and development

**COs-2:** Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals

**COs-3:** Know the regulatory approval process and their registration in Indian and international markets

#### **AUBP 805T: PHARMACOVIGILANCE**

**COs-1:** Importance of drug safety monitoring.

**COs-2:** History and development of pharmacovigilance

**COs-3:** National and international scenario of pharmacovigilance

**COs-4:** Dictionaries, coding and terminologies used in pharmacovigilance

**COs-5:** Detection of new adverse drug reactions and their assessment

**COs-6:** International standards for classification of diseases and drugs

**COs-7:** Adverse drug reaction reporting systems and communication in pharmacovigilance

**COs-8:** Methods to generate safety data during pre-clinical, clinical and post approval phases of drugs' life cycle

**COs-9:** Drug safety evaluation in paediatrics, geriatrics, pregnancy and lactation

**COs-10:** Pharmacovigilance Program of India (PvPI) requirement for ADR reporting in India

**COs-11:** ICH guidelines for ICSR, PSUR, expedited reporting, pharmacovigilance planning

**COs-12:** CIOMS requirements for ADR reporting

**COs-13:** Writing case narratives of adverse events and their quality.

#### **AUBP 806 ET. QUALITY CONTROL AND STANDARDIZATION OF HERBAL**

**COs-1:** Know WHO guidelines for quality control of herbal drugs

**COs-2:** Know Quality assurance in herbal drug industry

**COs-3:** Know the regulatory approval process and their registration in Indian and international markets

**COs-4:** Appreciate EU and ICH guidelines for quality control of herbal drugs

#### **AUBP 807 ET. COMPUTER AIDED DRUG DESIGN**

**COs-1:** Design and discovery of lead molecules

**COs-2:** The role of drug design in drug discovery process

**COs-3:** The concept of QSAR and docking

**COs-4:** Various strategies to develop new drug like molecules.

**COs-5:** The design of new drug molecules using molecular modeling software

#### **AUBP808ET: CELL AND MOLECULAR BIOLOGY**

**COs-1:** Summarize cell and molecular biology history.

**COs-2:** Summarize cellular functioning and composition.

**COs-3:** Describe the chemical foundations of cell biology.



**COs-4:** Summarize the DNA properties of cell biology.

**COs-5:** Describe protein structure and function.

**COs-6:** Describe cellular membrane structure and function.

**COs-7:** Describe basic molecular genetic mechanisms.

**COs-8:** Summarize the Cell Cycle

#### **AUBP810 ET. PHARMACOLOGICAL SCREENINGMETHODS**

**COs-1:** Appreciate the applications of various commonly used laboratory animals.

**COs-2:** Appreciate and demonstrate the various screening methods used in preclinical research

**COs-3:** Appreciate and demonstrate the importance of biostatistics and researchmethodology

**COs-4:** Design and execute a research hypothesis independently

#### **AUBP 811 ET. ADVANCED INSTRUMENTATION TECHNIQUES**

**COs-1:** Understand the advanced instruments used and its applications in drug analysis

**COs-2:** Understand the chromatographic separation and analysis of drugs.

**COs-3:** Understand the calibration of various analytical instruments

**COs-4:** Know analysis of drugs using various analytical instruments

#### **AUBP 812 ET. DIETARY SUPPLEMENTS AND NUTRACEUTICALS**

**COs-1:** Understand the need of supplements by the different group of people to maintainhealthy life.

**COs-2:** Understand the outcome of deficiencies in dietary supplements.

**COs-3:** Appreciate the components in dietary supplements and the application.

**COs-4:** Appreciate the regulatory and commercial aspects of dietary supplements including health claims.

### **D. Pharmacy**

#### **D PHARMACY 1<sup>ST</sup> YEAR**

##### **PHARMACEUTICS- I (AUDPH-111)**

COs-1.: Know the history of profession of pharmacy

COs-2.: Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations

COs-3.: Understand the professional way of handling the prescription

COs-4.: Preparation of various conventional dosage forms

##### **PHARMACEUTICAL CHEMISTRY –I (AUDPH-112)**

COs-1.: Write the structure, name and the type of isomerism of the organic compound

COs-2.: Write the reaction, name the reaction and orientation of reactions

COs-3.: Account for reactivity/stability of compounds,

COs-4.: Identify/confirm the identification of organic compound

### **PHARMACOGNOSY (AUDPH-113)**

COs-1.: understand raw material as source of drugs from cultivation to drugs

COs-2.: know the herbal cosmetics, natural sweeteners, nutraceuticals

### **BIOCHEMISTRY AND CLINICAL PATHOLOGY (AUDPH-114)**

COs-1.: Understand the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes.

COs-2.: Understand the metabolism of nutrient molecules in physiological and pathological conditions.

COs-3.: Understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins.

### **HUMAN ANATOMY AND PHYSIOLOGY (AUDPH-115)**

COs-1.: Explain the gross morphology, structure and functions of various organs of the human body.

COs-2.: Describe the various homeostatic mechanisms and their imbalances.

COs-3.: Identify the various tissues and organs of different systems of human body.

COs-4.: Perform the haematological tests like blood cell counts, haemoglobin estimation bleeding /clotting time etc and also record blood pressure, heart rate, pulse and respiratory volume.

COs-5.: Appreciate coordinated working pattern of different organs of each system

COs-6.: Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body.

### **HCP (AUDPH-116)**

COs-1.: Know various drug distribution methods in a hospital

COs-2.: Appreciate the pharmacy stores management and inventory control

COs-3.: Monitor drug therapy of patient through medication chart review and clinicalreview

COs-4.: Obtain medication history interview and counsel the patients

COs-5.: Identify drug related problems

COs-6.: Detect and assess adverse drug reactions

### **PHARMACEUTICS-II (AUDPH-221)**

- COs-1.: Understand various physicochemical properties of drug molecules in the designing the dosage forms
- COs-2.: Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations
- COs-3.: Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms.

### **PHARMACEUTICAL CHEMISTRY –II (AUDPH-222)**

- COs-1.: Write the structure, name and the type of isomerism of the organic compound
- COs-2.: Write the reaction, name the reaction and orientation of reactions
- COs-3.: Account for reactivity/stability of compounds,
- COs-4.: Prepare organic compounds

### **PHARMACOLOGY AND TOXICOLOGY (AUDPH-223)**

- COs-1.: Understand the pharmacological actions of different categories of drugs
- COs-2.: Explain the mechanism of drug action at organ system/sub cellular/macromolecular levels.
- COs-3.: Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.
- COs-4.: Observe the effect of drugs on animals by simulated experiments
- COs-5.: Appreciate correlation of pharmacology with other bio medical sciences
- COs-6.: Interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states
- COs-7.: Know pharmaceutical care services
- COs-8.: Do patient counseling in community pharmacy;
- COs-9.: Appreciate the concept of Rational drug therapy.

### **PHARMACEUTICAL JURISPRUDENCE (AUDPH-224)**

- COs-1.: The Pharmaceutical legislations and their implications in the development and marketing of pharmaceuticals.
- COs-2.: Various Indian pharmaceutical Acts and Laws
- COs-3.: The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
- COs-4.: The code of ethics during the pharmaceutical practice

### **DSBM (AUDPH-225)**

- COs-1.: The course aims to provide an understanding of marketing concepts and techniques and their applications in the pharmaceutical industry.

### **HCP (AUDPH-226)**

- COs-1.: Know various drug distribution methods in a hospital
- COs-2.: Appreciate the pharmacy stores management and inventory control
- COs-3.: Monitor drug therapy of patient through medication chart review and clinical review
- COs-4.: Obtain medication history interview and counsel the patients
- COs-5.: Identify drug related problems
- COs-6.: Detect and assess adverse drug reactions

### **PHARMACEUTICS (MPH)**

#### **MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES (AUMPH101T)**

- COs-1.: Chemicals and Excipients
- COs-2.: The analysis of various drugs in single and combination dosage forms
- COs-3.: Theoretical and practical skills of the instruments

#### **DRUG DELIVERY SYSTEMS (AUMPH102T)**

- COs-1.: The various approaches for development of novel drug delivery systems.
- COs-2.: The criteria for selection of drugs and polymers for the development of delivering system
- COs-3.: The formulation and evaluation of Novel drug delivery systems..

#### **MODERN PHARMACEUTICS (AUMPH103T)**

- COs-1.: The elements of preformulation studies.
- COs-2.: The Active Pharmaceutical Ingredients and Generic drug Product development
- COs-3.: Industrial Management and GMP Considerations.
- COs-4.: Optimization Techniques & Pilot Plant Scale Up Techniques
- COs-5.: Stability Testing, sterilization process & packaging of dosage forms.

#### **REGULATORY AFFAIRS (AUMPH104T)**

- COs-1.: The Concepts of innovator and generic drugs, drug development process
- COs-2.: The Regulatory guidance's and guidelines for filing and approval process
- COs-3.: Preparation of Dossiers and their submission to regulatory agencies in different countries
- COs-4.: Post approval regulatory requirements for actives and drug products
- COs-5.: Submission of global documents in CTD/ eCTD formats
- COs-6.: Clinical trials requirements for approvals for conducting clinical trials
- COs-7.: Pharmacovigilance and process of monitoring in clinical trials.

## **MOLECULAR PHARMACEUTICS (NANO TECHNOLOGY & TARGETED DDS) (NTDS) (AUMPH201T)**

- COs-1.: The various approaches for development of novel drug delivery systems.
- COs-2.: The criteria for selection of drugs and polymers for the development of NTDS
- COs-3.: The formulation and evaluation of novel drug delivery systems.

## **ADVANCED BIOPHARMACEUTICS & PHARMACOKINETICS (AUMPH202T)**

- COs-1.: The basic concepts in biopharmaceutics and pharmacokinetics.
- COs-2.: The use raw data and derive the pharmacokinetic models and parameters the best describe the process of drug absorption, distribution, metabolism and elimination.
- COs-3.: The critical evaluation of biopharmaceutic studies involving drug product equivalency.
- COs-4.: The design and evaluation of dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters.
- COs-5.: The potential clinical pharmacokinetic problems and application of basics of pharmacokinetic

## **COMPUTER AIDED DRUG DEVELOPMENT (AUMPH203T)**

- COs-1.: History of Computers in Pharmaceutical Research and Development
- COs-2.: Computational Modeling of Drug Disposition
- COs-3.: Computers in Preclinical Development
- COs-4.: Optimization Techniques in Pharmaceutical Formulation
- COs-5.: Computers in Market Analysis
- COs-6.: Computers in Clinical Development
- COs-7.: Artificial Intelligence (AI) and Robotics
- COs-8.: Computational fluid dynamics(CFD)

## **COSMETICS AND COSMECEUTICALS (AUMPH204T)**

- COs-1.: Key ingredients used in cosmetics and cosmeceuticals.
- COs-2.: Key building blocks for various formulations.
- COs-3.: Current technologies in the market
- COs-4.: Various key ingredients and basic science to develop cosmetics and cosmeceuticals
- COs-5.: Scientific knowledge to develop cosmetics and cosmeceuticals with desired Safety, stability, and efficacy.

## **PHARMACEUTICAL CHEMISTRY (AUMPC)**

### **MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES (AUMPC 101T)**

COs-1.: The analysis of various drugs in single and combination dosage forms

COs-2.: Theoretical and practical skills of the instruments

### **ADVANCED ORGANIC CHEMISTRY – I (AUMPC 102T)**

COs-1.: The principles and applications of retrosynthesis

COs-2.: The mechanism & applications of various named reactions

COs-3.: The concept of disconnection to develop synthetic routes for small target molecule.

COs-4.: The various catalysts used in organic reactions

COs-5.: The chemistry of heterocyclic compounds

### **ADVANCED MEDICINAL CHEMISTRY (AUMPC 103T)**

COs-1.: Different stages of drug discovery

COs-2.: Role of medicinal chemistry in drug research

COs-3.: Different techniques for drug discovery

COs-4.: Various strategies to design and develop new drug like molecules for biological targets

COs-5.: Peptidomimetics

### **CHEMISTRY OF NATURAL PRODUCTS (AUMPC 104T)**

COs-1.: Different types of natural compounds and their chemistry and medicinal importance

COs-2.: The importance of natural compounds as lead molecules for new drug discovery

COs-3.: The concept of rDNA technology tool for new drug discovery

COs-4.: General methods of structural elucidation of compounds of natural origin

COs-5.: Isolation, purification and characterization of simple chemical constituents from natural source

### **ADVANCED SPECTRAL ANALYSIS (AUMPC 201T)**

COs-1.: Interpretation of the NMR, Mass and IR spectra of various organic compounds

COs-2.: Theoretical and practical skills of the hyphenated instruments

COs-3.: Identification of organic compounds

### **ADVANCED ORGANIC CHEMISTRY – II (AUMPC 202T)**

COs-1.: The principles and applications of Green chemistry

COs-2.: The concept of peptide chemistry.

COs-3.: The various catalysts used in organic reactions

COs-4.: The concept of stereochemistry and asymmetric synthesis.

### **COMPUTER AIDED DRUG DESIGN (AUMPC 203T)**

COs-1.: Role of CADD in drug discovery

COs-2.: Different CADD techniques and their applications

COs-3.: Various strategies to design and develop new drug like molecules.

COs-4.: Working with molecular modeling softwares to design new drug molecules

COs-5.: The in silico virtual screening protocols

### **PHARMACEUTICAL PROCESS CHEMISTRY (AUMPC 204T)**

COs-1.: The strategies of scale up process of APIs and intermediates

COs-2.: The various unit operations and various reactions in process chemistry

## **PHARMACOGNOSY (AUMPG)**

### **MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES (AUMPG 101T)**

COs-1.: The analysis of various drugs in single and combination dosage forms

COs-2.: Theoretical and practical skills of the instruments

### **ADVANCED PHARMACOGNOSY – I (AUMPG 102T)**

COs-1.: Advances in the cultivation and production of drugs

COs-2.: Various phyto-pharmaceuticals and their source, its utilization and medicinal value.

COs-3.: Various nutraceuticals/herbs and their health benefits

COs-4.: Drugs of marine origin

COs-5.: Pharmacovigilance of drugs of natural origin

### **PHYTOCHEMISTRY (AUMPG 103T)**

COs-1.: Different classes of phytoconstituents, their biosynthetic pathways, their properties, extraction and general process of natural product drug discovery

COs-2.: Phytochemical fingerprinting and structure elucidation of phytoconstituents.

### **INDUSTRIAL PHARMACOGNOSTICAL TECHNOLOGY (AUMPG 104T)**

COs-1.: The requirements for setting up the herbal/natural drug industry.

COs-2.: The guidelines for quality of herbal/natural medicines and regulatory issues.

COs-3.: The patenting/IPR of herbals/natural drugs and trade of raw and finished materials.

### **MEDICINAL PLANT BIOTECHNOLOGY (AUMPG 201T)**

COs-1.: Know the process like genetic engineering in medicinal plants for higher yield of Phytopharmaceuticals.

COs-2.: Use the biotechnological techniques for obtaining and improving the quality of natural products/medicinal plants

### **ADVANCED PHARMACOGNOSY – II (AUMPG 202T)**

COs-1.: Validation of herbal remedies

COs-2.: Methods of detection of adulteration and evaluation techniques for the herbal drugs



COs-3.: Methods of screening of herbals for various biological properties

### **INDIAN SYSTEMS OF MEDICINE (AUMPG 203T)**

COs-1.: To understand the basic principles of various Indian systems of medicine

COs-2.: To know the clinical research of traditional medicines, Current Good Manufacturing Practice of Indian systems of medicine and their formulations.

### **HERBAL COSMETICS (AUMPG 204T)**

COs-1.: Understand the basic principles of various herbal/natural cosmetic preparations

COs-2.: Current Good Manufacturing Practices of herbal/natural cosmetics as per the regulatory authorities

**ABHILASHI UNIVERSITY**  
**ENGINEERING AND MANAGEMENT**

**B.TECH (C.S.E)**

**3<sup>rd</sup> -8<sup>th</sup> semester**

***COURSE OUTCOME***

<b>3<sup>RD</sup> SEM</b>		
<b>COURSE NAME</b>	<b>COURSE CODE</b>	<b>COURSE OUTCOME</b>
<b>Probability &amp; Statistics</b>	<b>AUBTCSE-201</b>	To analyze various probabilistic use. To design statistical methods or models
<b>Industrial economics and management</b>	<b>AUBTCSE-202</b>	Utilize the tools and techniques for economic analysis of alternative 15 opportunities, considering time value of money and risk associated with returns. Recognize the fundamentals of Management thoughts that are vital for the development of conceptual frame work of Management as a discipline.
<b>Data structure</b>	<b>AUBTCSE-203</b>	To compare different algorithms, their advantages and disadvantages, choose appropriate data structure as applied to specified problem definition.
<b>OOPS using C++</b>	<b>AUBTCSE-204</b>	A competence to design, writes, compile, test and execute straightforward programs using a high level Language and also applying the knowledge of OOP.
<b>Digital electronics</b>	<b>AUBTCSE-205</b>	To state differences between number systems and describe some different codes. To explain the function of basic digital combinatorial circuits and sequential circuits.
<b>Computer architecture and organization</b>	<b>AUBTCSE-206</b>	Recognize and manipulate representations of numbers stored in digital computers. Recall the history and development of modern computers, developing an appreciation for the potential and directions for future changes.

<b>Sociology&amp; elements of Indian history for engineers</b>	<b>AUBTCSE-OE*-207</b>	The objective of this course is to familiarize the prospective engineers with elements of Indian history and sociological concepts and theories by which they could understand contemporary issues and problems in Indian society.
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<b>4<sup>TH</sup> SEM</b>		
<b>COURSE NAME</b>	<b>COURSE CODE</b>	<b>COURSE OUTCOME</b>
<b>Optimization and Calculus of Variations</b>	<b>AUBTCSE-211</b>	To understand the graphical ideas which should be used by various computer applications in Soft Computing like data mining, image processing, clustering, image capturing etc.
<b>Human Values and Professional Ethics</b>	<b>AUBTCSE-212</b>	To describe confidentiality, professional behaviour to ethical dilemmas and determine appropriate approach. CO3 To apply fundamental ethical principles of integrity, objectivity, professional competence, due care
<b>Database Management System</b>	<b>AUBTCSE-213</b>	Demonstrate an understanding of relational database using normalization theory. Transform an information model into a relational database schema and to apply a data definition language, data manipulation language and/or utilities to implement the schema using a SQL.
<b>Operating System</b>	<b>AUBTCSE-214</b>	To know the basic principles of operating systems and compare different styles of operating systems.
<b>Theory of Computation</b>	<b>AUBTCSE-215</b>	To introduce students to the mathematical foundations of computation including automata theory; the theory of formal languages and grammars; the notions of algorithm, decidability, complexity, and computability.
<b>Microprocessor &amp; Peripherals</b>	<b>AUBTCSE-216</b>	To define the detailing (8085 IC, RAM, ROM, keyboard, display unit, crystal oscillator etc.) of 8085 training board. CO2 To explain 8085 microprocessor instruction set, addressing mode and the procedure for storing data and execution of program.
<b>Law for Engineers</b>	<b>AUBTCSE-OE*-217</b>	Be able to understand some of the legal terminologies and the implications of different laws in business management. Be able to analyze situations and use effective decision making and

problem solving techniques in different scenarios.

## 5<sup>TH</sup> SEM

<b>COURSE NAME</b>	<b>COURSE CODE</b>	<b>COURSE OUTCOME</b>
<b>Computer Networks</b>	<b>AUBTCSE-301</b>	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 LAN systems.
<b>Core Java</b>	<b>AUBTCSE-302</b>	At the end of the course the participant will be able to: • Implement object oriented programming concepts. Use and create package and interfaces in a Java program. Use graphical user interface in Java programs • Create applets.
<b>Computer Graphics</b>	<b>AUBTCSE-303</b>	Explain the core concepts of computer graphics, including viewing, projection, perspective, modelling and transformation in two and three dimensions. apply the concepts of colour models, lighting and shading models, textures, ray tracing, hidden surface elimination, anti-aliasing, and rendering.
<b>Artificial Intelligence and Expert Systems</b>	<b>AUBTCSE-304</b>	Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations. Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.
<b>Software Engineering</b>	<b>AUBTCSE-305</b>	Basic knowledge and understanding of the analysis and design of complex systems. Ability to apply software engineering principles and techniques. Ability to develop, maintain and evaluate large-scale software systems.
<b>Analysis and Design of Algorithm</b>	<b>AUBTCSE-306</b>	Write rigorous correctness proofs for algorithms. Demonstrate a

		familiarity with major algorithms and data structures. Apply important algorithmic design paradigms and methods of analysis. Synthesize efficient algorithms in common engineering design situations.
<b>Basics of Operating Systems</b>	<b>AUBTCSE-OE*-307</b>	A successful student will be able to understand the basic components of a computer operating system, and the interactions among the various components. The course will cover an introduction on the policies for scheduling, deadlocks, memory management, synchronization, system calls, and file systems.
<b>PC Maintenance &amp; Troubleshooting</b>	<b>AUBTCSE-OE*-308</b>	Design and develop applications to analyze and solve all computer science related problems. Involve in perennial learning for a continued career development and progress as a computer professional.
<b>Management of Information System</b>	<b>AUBTCSE-OE*-309</b>	Relate the basic concepts and technologies used in the field of management information systems; 2. Compare the processes of developing and implementing information systems. 3. Outline the role of the ethical, social, and security issues of information systems.
<b>6<sup>TH</sup> SEM</b>		
<b>COURSE NAME</b>	<b>COURSE CODE</b>	<b>COURSE OUTCOME</b>
<b>Advanced Java</b>	<b>AUBTCSE-311</b>	Develop error-free, well-documented Java programs; develop and test Java network, search engine, and web framework programs. Learn how to write, test, and debug advanced-level Object-Oriented programs using Java.
<b>Distributed Operating System</b>	<b>AUBTCSE-312</b>	To provide hardware and software issues in modern distributed systems. CO2: To get knowledge in distributed architecture,

		naming, synchronization, consistency and replication, fault tolerance, security, and distributed file systems.
<b>Compiler Design</b>	<b>AUBTCSE-313</b>	At the end of the course, students will understand different considerations and phases of compilation, the impact of language attributes upon the compilation process, the effect of hardware feature on the generated code and the practical fundamentals of compiler implementation.
<b>Linux Administration</b>	<b>AUBTCSE-314</b>	After completing this course, students will be able to: Perform essential Linux commands such as installation, searches and manipulating files. Operate running Linux systems by managing the boot process, scheduling jobs, updating the system, monitoring system performance and managing security.
<b>Data Mining and Data Warehousing</b>	<b>AUBTCSE-315</b>	This course gives an introduction to methods and theory for development of data warehouses and data analysis using data mining. Data quality and methods and techniques for preprocessing of data
<b>Modeling and Simulation</b>	<b>AUBTCSE-316</b>	Grasping modeling concepts using mean value analysis with some information technology applications. Grasping how to build appropriate simulation models together with their parameterization and the analysis of simulator output data.
<b>Management Information Systems</b>	<b>AUBTCSE-OE*-317</b>	evaluate the benefits and limitations of enterprise systems and industrial networks. explain relationships between concepts of information systems, organization, management and strategy. identify the salient characteristics of organizations. analyze the relationship between information systems and organizations.
<b>Enterprise Resource Planning</b>	<b>AUBTCSE-OE*-318</b>	To provide a contemporary and forward-looking on the theory

		and practice of Enterprise Resource Planning Technology. To focus on a strong emphasis upon practice of theory in Applications and Practical-oriented approach
<b>Multimedia Technology</b>	<b>AUBTCSE-OE*-319</b>	Define multimedia to potential clients. Identify and describe the function of the general skill sets in the multimedia industry. Identify the basic components of a multimedia project. Identify the basic hardware and software requirements for multimedia development and playback
<b>7<sup>TH</sup> SEM</b>		
<b>COURSE NAME</b>	<b>COURSE CODE</b>	<b>COURSE OUTCOME</b>
<b>Advanced Computer Architecture</b>	<b>AUBTCSE-401</b>	Demonstrate concepts of parallelism in hardware/software. CO2 : Discuss memory organization and mapping techniques. CO3 : Describe architectural features of advanced processors. CO4 : Interpret performance of different pipelined processors.
<b>Wireless &amp; Mobile Communication</b>	<b>AUBTCSE-402</b>	analyze the Mobile radio propagation, fading, diversity concepts and the channel modeling. CO3: analyze the design parameters, link design, smart antenna, beam forming and MIMO systems. CO4: analyze Multiuser Systems, CDMA, WCDMA network planning and OFDM Concepts.
<b>Information System &amp; Securities</b>	<b>AUBTCSE-403</b>	Students themselves can formulate simple algorithms to solve problems, and can code them in a high-level language appropriate for corporate use.
<b>Cloud Computing</b>	<b>AUBTCSE-404</b>	explain the core issues of cloud computing such as security, privacy, and interoperability. choose the appropriate technologies, algorithms, and approaches for the related issues. identify problems, and explain, analyze, and evaluate various

		cloud computing solutions
<b>Big Data Analytics</b>	<b>AUBTCSE-OE*-405</b>	To study the basic technologies that forms the foundations of Big Data. To study the programming aspects of cloud computing with a view to rapid prototyping of complex applications. To understand the specialized aspects of big data including big data application, and big data analytics
<b>Embedded System</b>	<b>AUBTCSE-OE*-406</b>	Foster ability to understand the internal architecture and interfacing of different peripheral devices with Microcontrollers. 2. Foster ability to write the programs for microcontroller.
<b>Web Technology</b>	<b>AUBTCSE-OE*-407</b>	The students will be able to: • Analyze a web page and identify its elements and attributes. Create web pages using XHTML and Cascading Style Sheets. Build dynamic web pages using JavaScript (Client side programming). Create XML documents and Schemas.
	<b>8<sup>TH</sup> SEM</b>	
<b>COURSE NAME</b>	<b>COURSE CODE</b>	<b>COURSE OUTCOME</b>
<b>Mobile Adhoc &amp; Sensors Networks</b>	<b>AUBTCSE-OE*-410</b>	To Learn the Basics of Sensor network and Mobile Ad hoc Networks with its Protocol Design. To Develop MAC routing protocol for sensor and mobile Networks.To Study an efficient protocol for sensor Network. Design the protocol for Sensor and mobile Network.
<b>Distributed Computing</b>	<b>AUBTCSE-OE*-411</b>	To provide hardware and software issues in modern distributed systems. CO2: To get knowledge in distributed architecture, naming, synchronization, consistency and replication, fault



		tolerance, security, and distributed file systems
<b>Soft Computing</b>	<b>AUBTCSE-OE*-412</b>	Upon successful completion of the course, students will have an understanding of the basic areas of Soft Computing including Artificial Neural Networks, Fuzzy Logic and Genetic Algorithms. Provide the mathematical background for carrying out the optimization associated with neural network learning.
<b>Mobile Application Development</b>	<b>AUBTCSE-OE*-413</b>	This course is concerned with the development of applications on mobile and wireless computing platforms. Android will be used as a basis for teaching programming techniques and design patterns related to the development of standalone applications and mobile portals to enterprise and commerce
<b>Natural Language Processing</b>	<b>AUBTCSE-OE*-414</b>	This course introduces the fundamental concepts and techniques of natural language processing (NLP). Students will gain an in-depth understanding of the computational properties of natural languages and the commonly used algorithms for processing linguistic information
<b>Cyber Security &amp; Cyber Laws</b>	<b>AUBTCSE-OE*-415</b>	Make Learner Conversant With The Social And Intellectual Property Issues Emerging From 'Cyberspace. ... Give Learners In Depth Knowledge Of Information Technology Act And Legal Frame Work Of Right To Privacy, Data Security And Data Protection. 5. Make Study On Various Case Studies On Real Time Crimes.
<b>Project Work – II/ Industrial Project</b>	<b>AUBTCSE-416 (L)</b>	An ability to work in actual working environment An ability to write technical documents and give oral presentations related to the work completed

**ABHILASHI UNIVERSITY**  
**ENGINEERING AND MANAGEMENT**

**B.TECH (M E)**

**3<sup>rd</sup> -8<sup>th</sup> semester**

**COURSE OUTCOME**

<b>3<sup>RD</sup> SEM</b>		
<b>COURSE CODE</b>	<b>COURSE NAME</b>	<b>COURSE OUTCOME</b>
AUBTCSE-201	Probability & Statistics	To analyze various probabilistic use. To design statistical methods or models
AUBTCSE-202	Industrial economics and management	Utilize the tools and techniques for economic analysis of alternative 15 opportunities, considering time value of money and risk associated with returns. Recognize the fundamentals of Management thoughts that are vital for the development of conceptual frame work of Management as a discipline.
AUBTME-203	Strength of Materials-I	Student will able to solve various problems related to physical materials of daily life
AUBTME-204	Engineering Thermodynamics	Student will able to understand basic concept of thermodynamics, restate definitions, and calculations of absolute and gage pressures
AUBTME-205	Fluid Mechanics	Student will able to solve various problems related to fluid properties, statistics, measurements flow through pipes
AUBTME-206	Machine Drawing	Student will able to understand about technical

		drawing that shows information about heating, ventilation, air conditioning & transportation around buildings (elevators)
AUBTME-OE*-207	Law for Engineers Engineers	Student will able to understand social structure and social process related to social laws
AUBTME-OE* - 208	German Language - I	Student will able to understand foreign language
AUBTME-OE* - 209	French Language - I	Student will able to understand foreign language

<b>4<sup>TH</sup> SEM</b>		
<b>COURSE CODE</b>	<b>COURSE NAME</b>	<b>COURSE OUTCOME</b>
AUBTME-210	Human Values and Professional Ethics	. To describe confidentiality, professional behaviour to ethical dilemmas and determine appropriate approach. CO3 To apply fundamental ethical principles of integrity, objectivity, professional competence, due care
AUBTME-211	Optimization and Calculus of Variations	Student will able to perform various mathematical experiments and trials related to linear & non linear programming
AUBTME-212	Manufacturing Technology-I	The student will be able to develop simplified manufacturing processes with the aim of reduction of cost and manpower. The student will be able to identify/control the appropriate process parameters, and possible defects of manufacturing processes so as to remove them.
AUBTME-213	Strength of Material-II	Student will able to solve various problems related to physical materials of daily life
AUBTME-214	I.C Engines	Students will be able to explain fuel supply systems,

		combustion and emission aspects of IC engines and recent developments in IC engines.
AUBTME-215	Turbo Machines	Students will be able to select turbo machine for given application. Predict performance of turbo machine using model analysis. Understand mechanisms behind working of Turbines
AUBTCSE-OE*-217	Law for Engineers	Student will able to understand social structure and social process related to social laws
AUBTME-OE*-217	German Language - II	Student will able to understand foreign language
AUBTME-OE*-218	French Language - II	Student will able to understand foreign language
<b>5<sup>TH</sup> SEM</b>		
<b>COURSE CODE</b>	<b>COURSE NAME</b>	<b>COURSE OUTCOME</b>
AUBTME-301	Kinematics of Machines	Student will be able to develop skills for designing and analyzing linkages, cams, gears and other mechanism and will develop skills for use of mathematics software and for writing computer programs to solve kinematics problems.
AUBTME-302	Manufacturing Technology-II	The student will be able to develop simplified manufacturing processes with the aim of reduction of cost and manpower. The student will be able to

		identify/control the appropriate process parameters, and possible defects of manufacturing processes so as to remove them.
AUBTME-303	Heat Transfer	The student will be able to understand Heat transfer by conduction in solids for steady-state and transient conditions. - Heat transfer by convection in closed conduits and on external surfaces.
AUBTME-304	Machine Design-I	The student will be able to understand and apply principles of gear design to spur gears and industrial spur gear boxes.  To learn a skill to design worm gear box for various industrial applications.
AUBTME-305	Automobile Engineering	The student will be able to Identify the different parts of the automobile & working of various parts like engine, transmission, clutch, brakes & also Describe how the steering and the suspension systems operate.
AUBTME-306	Materials Technology	The student will be able to understand fundamentals of electrical, magnetic and optical properties of materials and to apply those fundamentals for selecting and developing materials for different engineering applications.
AUBTME- OE*-307	Robotics	Students will be able to work through complex logic problems and will improve crucial puzzle-solving skills. In The addition to this, it also gives them the ideal

		environment to learn how to handle making mistakes
AUBTME- OE*-308	Automobile Technology	The student will be able to Identify the different parts of the automobile & working of various parts like engine, transmission, clutch, brakes & also Describe how the steering and the suspension systems operate.
AUBTME- OE*-309	Value Engineering	The student will be able to understand techniques of reducing project cost, without reducing the quality.  Cost reduction can be achieved by taking advantage of the existing streets and utilities, or the prevailing winds and available solar heat.
<b>6<sup>TH</sup> SEM</b>		
<b>COURSE CODE</b>	<b>COURSE NAME</b>	<b>COURSE OUTCOME</b>
AUBTME-311	Computer Aided Design and Manufacturing (CAD/CAM)	The student will be able to understand the concepts and underlying theory of modelling and the usage of models in different engineering applications  Create accurate and precise geometry of complex engineering systems and use the geometric models in different engineering applications
AUBTME-312	Measurement and Control	The student will be able to understand the methods of measurement and selection of measuring instruments

		<p>,standards of measurement</p> <p>Identify and apply various measuring instruments</p> <p>Explain tolerance, limits of size, fits, geometric and position tolerances and gauge design</p>
AUBTME-313	Machine Design-II	<p>The student will be able to understand and apply principles of gear design to spur gears and industrial spur gear boxes.</p> <p>To learn a skill to design worm gear box for various industrial applications.</p>
AUBTME-314	Operation research	<p>The student will be able to formulate and solve problems as networks and graphs. Develop linear programming (LP) models for shortest path, maximum flow, minimal spanning tree, critical path, minimum cost flow, and transshipment problems.</p>
AUBTME-315	Thermal Engineering	<p>Students will be able to have knowledge of different aspects of designing of a thermal system, Identify and examine a design problem associated to a thermal system.</p>
AUBTME-316	Dynamics of Machinery	<p>The student will be able to understand fundamental knowledge of dynamics of machines so that student can appreciate problems of dynamic force balance, transmissibility of forces, isolation of systems, vibrations</p>
AUBTME- OE*-317	Modern Manufacturing	<p>The student will be able to understand fundamental</p>

	processes	knowledge and understanding of Production and Industrial Engineering and acquire abilities and capabilities in the areas of advanced manufacturing methods, quality assurance and shop floor management.
AUBTME- OE*-318	Maintenance and Reliability	The student will be able to understand estimating the likely reliability of new designs, and for analysing reliability data Able to train personnel in specific maintenance skills. Advise on the acquisition, installation and operation of machinery. Ensure environmental protection
AUBTME- OE*-319	Composite Materials	The student will be able to understand the specifics of mechanical behaviour of layered composites compared to isotropic materials and constitutive equations of composite materials and understand mechanical behaviour at micro, macro and meso level and determine stresses and strains in composites.
<b>7<sup>TH</sup> SEM</b>		
<b>COURSE CODE</b>	<b>COURSE NAME</b>	<b>COURSE OUTCOME</b>
AUBTME-401	Industrial automation and Robotics	Students will be able to work through complex logic problems and will improve crucial puzzle-solving skills. In The addition to this, it also gives them the ideal environment to learn how to handle making mistakes
AUBTME-402	Refrigeration & Air	Student will able to understand Refrigeration and its



	Conditioning	process where heat is transferred from low temperature to high temperature medium with the help of external work.
AUBTME-403	Power Plant Engineering	Student will able to understand the various sources of energy and Gain the knowledge regarding Equipment, Plant layout, principle of working of various diesel and gas turbine plants.
AUBTME-404	Industrial Engineering & Production Management	The student will be able to understand fundamental knowledge and understanding of Production and Industrial Engineering and acquire abilities and capabilities in the areas of advanced manufacturing methods, quality assurance and shop floor management.
AUBTME- OE*-405	Material handling and Plant layout	The student will be able to understand economies in handling of raw materials, work in- progress and finished goods and to reduce the quantum of work-in-progress.
AUBTME- OE*-406	Industrial Tribology	The student will be able to understand the friction, wear, and lubrication of interacting surfaces through physical and chemical processes, near or on a surface.
AUBTME- OE*-407	Finite Element Method	The student will be able to understand and quantify the effects of real-world conditions on a part or assembly.

**8<sup>TH</sup> SEM**

<b>COURSE CODE</b>	<b>COURSE NAME</b>	<b>COURSE OUTCOME</b>
AUBTME-419	Industrial Project	Student will able to understand various elements of mechanical engineering mechanism of machines and also able to use various methodologies and aspects related to problem solving techniques.
AUBTME- OE*-412	Total Quality Management	Student will able to understand the quality aspect in various products, services, processes, people, resources and interactions.
AUBTME- OE*-413	Non-Conventional Energy resources	Student will able to understand the Non-conventional energies and their applications and basic understanding of Solar energy, types of solar collectors and their application.
AUBTME- OE*-414	Production Planning and control	The student will be able to understand fundamental knowledge and understanding of Production and Industrial Engineering and acquire abilities and capabilities in the areas of advanced manufacturing methods, quality assurance and shop floor management.
AUBTME- OE*-415	Mechatronics	The student will be able to develop, assemble, maintain and optimize products, systems, machines, installations or industrial processes.
AUBTME- OE*-416	Gas Dynamics	The student will be able to understand and compare

		the working of various jet engines and calculate thrust & efficiency in jet propulsion using gas dynamics principles.
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## B-TECH CIVIL ENGINEERING SYLLABUS OUTCOME

SUBJECT CODE	SUBJECT NAME	COURSE OUTCOMES
<b>3<sup>RD</sup> SEMESTER</b>		
AUBTCE-201	Probability and Statistics	Student will able to perform various mathematical experiments and trials
AUBTCE-202	Industrial Economics and Management	Student will able to apply various value and investment analysis of HR and financial resources
AUBTCE-203	Mechanics of Solids	Student will able to solve various problems related to physical materials of daily life
AUBTCE-204	Mechanics of Fluids - I	Student will able to solve various problems related to fluid properties, statistics, measurements flow through pipes
AUBTCE-205	Building Materials	Student will able to understand various elements of building material construction
AUBTCE-206	Engineering Surveying-I	Student will able to perform various surveys related to open land, construction sites
AUBTCEOE*-207	Sociology & Elements of Indian History for Engineers	Student will able to understand social structure and social process related to Indian history of engineering
AUBTCEOE*-208	German Language – I	Student will able to understand foreign language
AUBTCEOE*-209	French Language - I	Student will able to understand foreign language
<b>4<sup>TH</sup> SEMESTER</b>		
AUBTCE-211	Optimization and Calculus of Variations	Student will able to perform various mathematical experiments and trials related to linear & non linear programming.
AUBTCE-212	Human Values and Professional Ethics	Student will able to behave properly in society
AUBTCE-213	Structural Analysis –I	Student will able to solve various problems related to physical and mechanical aspects of civil constructions
AUBTCE-214	Geotechnical Engg. –I	Student will able to understand various elements of physical land and soil
AUBTCE-215	Engineering Surveying –II	Student will able to perform various surveys related to open land, construction sites
AUBTCE-216	Building Planning and Construction	Student will able to apply various elements of building planning aspects
AUBTCEOE*-217	Law for Engineers	Student will able to understand social structure and social process related to social laws
AUBTCE OE*-218	German Language – II	Student will able to understand foreign language
AUBTCE OE*-219	French Language - II	Student will able to understand foreign language

<b>5<sup>TH</sup> SEMESTER</b>		
AUBTCE-301	Limit State Design of Concrete Structures-I	Student will able to solve various problems related to physical and mechanical aspects of civil constructions
AUBTCE-302	Structural Analysis - II	Student will able to solve various problems related to physical and mechanical aspects of civil constructions
AUBTCE-303	Geotechnical Engg. - II	Student will able to understand various elements of physical land and soil
AUBTCE-304	Mechanics of Fluid - II	Student will able to solve various problems related to fluid properties, statistics, measurements flow through pipes
AUBTCE-305	Environmental Engg. - I	Student will able to understand and apply various aspects of near environment
AUBTCE-306	Transportation Engg. - I	Able to acquire and apply knowledge of Public transport, its planning, its components and its characteristics
AUBTCEOE*-307	Element of Civil Engineering	Able to apply the knowledge of sampling data in conducting various surveys and analysis
AUBTCEOE*-308	Optimization Methods in Engineering	Student will able to perform various mathematical experiments and trials related to linear & non linear programming.
AUBTCEOE*-310	Environmental Impact Assessment	Familiarization with various problems related to environmental health and social issues
<b>6<sup>TH</sup> SEMESTER</b>		
AUBTCE-311	Design of Concrete Structures-II	Student will able to solve various problems related to physical and mechanical aspects of civil constructions
AUBTCE-312	Transportation Engg. - II	Able to acquire and apply knowledge of Public transport, its planning, its components and its characteristics
AUBTCE-313	Environmental Engg. - II	Student will able to understand and apply various aspects of near environment
AUBTCE-314	Hydrology and Water Resources Engg.	Able to analyze the rain fall data with the help of hydrological models and to estimate the design flood. Able to apply the model results in verifying the analysis and design of structures
AUBTCE-315	Engineering Geology and Rock Mechanics	Student will able to understand various elements of physical land, soil and other geological aspects
AUBTCE-316	Concrete Technology	Understand the principles of concrete technology and apply them during construction supervision and testing. Supervise and manage concrete manufacturing and construction.
AUBTCEOE*-318	Remote Sensing and Applications of GIS	Student will able to acquire and apply knowledge of GIS, its planning, its applications, its components and its characteristics

		Able to apply the knowledge of sampling data in conducting various surveys and analysis
AUBTCEOE*-319	Hydraulic Machines	Student will able to acquire and apply knowledge of various hydraulic machines, its components and its characteristics
AUBTCEOE*-320	Energy Efficient Buildings	Student will able to acquire and apply knowledge of Renewable energy resources, its planning, its components and its characteristics
<b>7<sup>TH</sup> SEMESTER</b>		
AUBTCE-401	Limit State Design of Metal Structures	Student will able to acquire and apply knowledge of Advanced metal structures, its components and its characteristics
AUBTCE-402	Quantity Surveying and Valuation	Student will able to acquire and apply knowledge of estimation of quantities and will able to analysis rates and valuations of different materials related to construction
AUBTCE-403	Irrigation and Design of Hydraulic Structures	Student will able to make use of concept of planning, optimal design criteria and application of economics in water resources projects
AUBTCE-404	Construction Engineering and Management	Student will able to apply various elements of building planning aspects
AUBTCEOE*-405	Municipal Solid Waste Management	Student will able to acquire and apply knowledge of solid waste, its management , its components and its characteristics
AUBTCEOE*-406	Bridge Engineering	Student will able to acquire and apply knowledge of bridge infrastructure, its planning, its design, its applications, its components and its characteristics
AUBTCEOE*-407	Finite Element Method	Student will able to understand various properties and characteristics of three dimensional structures
<b>8<sup>TH</sup> SEMSTER</b>		
AUBTCE-411(L)	Project Work - II	Student will able to understand various elements of civil engineering construction physically on site and also able to use various methodologies and aspects related to problem solving techniques
AUBTCEOE*-412	Highway Pavement Design	Student will able to acquire and apply knowledge of pavement, its planning, its design, its applications, its components and its characteristics
AUBTCEOE*-413	Ground Water Hydrology	Student will able to analyze the rain fall data with the help of hydrological models and to estimate the design flood and ground water
AUBTCEOE*-414	Water Power Engineering	Student will able to understand various structures related to water power engineering
AUBTCEOE*-415	Design of Pre-stressed Concrete Structures	Student will able to acquire and apply knowledge of pre- stressed concrete Structures its components and its characteristics
AUBTCEOE*-416	Design of Earthquake Resistant Structures	Student will able to acquire and apply knowledge of seismology, seismic designs, seismic resistant Structures its components and its characteristics

AUBTCEO*-417	Transportation System Planning	Student will able to acquire and apply knowledge of Public transport, its planning, its components and its characteristics and also able to apply the knowledge of sampling data in conducting various surveys and analysis
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## M-TECH CIVIL ENGINEERING SYLLABUS OUTCOMES AND OBJECTIVES

SUBJECT CODE	SUBJECT NAME	OBJECTIVES	OUTCOMES
<b>1<sup>ST</sup> SEMESTER</b>			
<b>AUMTCE-101</b>	<b>Agricultural Engineering</b>	Provide an insight on Agricultural Engineering, management and its components,	Able to Understand the principles of Agricultural Engineering and apply them in the fields to enhance the production
<b>AUMTCE-102</b>	<b>Research Methodology</b>	The method is supported by powerful optimization and numerical techniques, which allow us to work with bodies of complex initial design and with very fine finite-element meshes, giving thus quite accurate solutions even in "difficult" parts and for complex geometries.	Able to apply the knowledge of sampling data & conducting various analysis
<b>AUMTCE-103</b>	<b>Advanced Concrete Technology</b>	Understand the principles of concrete technology and apply them during construction supervision and testing.  Supervise and manage concrete manufacturing and construction.	Information on various ingredients, their physical and chemical properties including properties of green and hardened concrete Mix design procedures as per BIS, ACI and British mix methods, including design of concrete using fibers and mineral architecture.
<b>AUMTCE-104(A)</b>	<b>Composite Materials</b>	Understand the principles of Composite Materials and apply them during construction supervision and testing. Supervise and manage concrete manufacturing and construction. Interpret the test results in accordance with BIS Stipulations.	Able to Plan the quality checks and bring about economy in concrete construction.



<b>AUMTCE-104(B)</b>	<b>Construction planning &amp; Management</b>	<p>Provide an insight on Construction planning, scheduling, its components and its characteristics</p> <p>Explain sampling of data, analysis and interpretation of data in conducting various survey</p>	<p>Able to acquire and apply knowledge of Construction planning, scheduling, its components and its characteristics</p> <p>Able to apply the knowledge of sampling data in conducting various surveys and analysis</p>
<b>2<sup>ND</sup> SEMESTER</b>			
<b>AUMTCE-201</b>	<b>Solid Waste Management</b>	<p>Provide an insight on Solid waste, its components and its characteristics</p> <p>Explain sampling , transportation, treatment and disposal of waste</p>	<p>Able to acquire and apply knowledge of solid waste, its management , its components and its characteristics</p>
<b>AUMTCE-202</b>	<b>Environmental Health &amp; Hygiene</b>	<p>Gain knowledge concerning environmental health, various pollutants, disease parameters etc.</p>	<p>Familiarization with various problems related to environmental health</p>
<b>AUMTCE-203</b>	<b>Advanced RCC Design</b>	<p>Provide an insight on RCC Design, its planning, its components and its characteristics</p> <p>Explain sampling of data, analysis and interpretation of data in conducting various survey</p>	<p>Able to design and analyze various types of problems related to concrete designs.</p>
<b>AUMTCE-204(A)</b>	<b>Advanced Structural Analysis</b>	<p>The main objective is to enable the student to have a good grasp of all the fundamental issues in these advanced topics in Advanced Structural Analysis</p> <p>Explain sampling of data, analysis and interpretation of data in conducting various survey</p>	<p>Able to acquire and apply knowledge of Advanced Structural analysis, its components and its characteristics</p>
<b>AUMTCE-204(B)</b>	<b>Advanced Hydrology</b>	<p>To introduce the fundamentals of hydrological models used in solving the water resources problems.</p> <p>To understand practical flow aspects of fluid flow in</p>	<p>Able to analyze the rain fall data with the help of hydrological models and to estimate the design flood.</p>

		various hydraulic structures such as open channel, canal falls, hydraulic jump, dams and spillway etc.	Able to apply the model results in verifying the analysis and design of structures.
<b>3<sup>RD</sup> SEMESTER TRANSPORTATION ENGINEERING</b>			
<b>AUMTCE-301(T)</b>	<b>Public Transportation Planning</b>	Provide an insight on Public transport, its planning, its components and its characteristics  Explain sampling of data, analysis and interpretation of data in conducting various survey	Able to acquire and apply knowledge of Public transport, its planning, its components and its characteristics  Able to apply the knowledge of sampling data in conducting various surveys and analysis
<b>AUMTCE-302(T)</b>	<b>Remote Sensing &amp; GIS</b>	Provide an insight on GIS, its planning, its applications, its components and its characteristics  Explain sampling of data, analysis and interpretation of data in conducting various survey	Able to acquire and apply knowledge of GIS, its planning, its applications, its components and its characteristics  Able to apply the knowledge of sampling data in conducting various surveys and analysis
<b>AUMTCE-303(T)</b>	<b>Railway Infrastructure Planning &amp; Design</b>	Provide an insight on Railway infrastructure, its planning, its design, its applications, its components and its characteristics  Explain sampling of data, analysis and interpretation of data in conducting various survey	Able to acquire and apply knowledge of Railway infrastructure, its planning, its design, its applications, its components and its characteristics Able to apply the knowledge of sampling data
<b>AUMTCE-304(T)</b>	<b>Highway Pavement Design</b>	Provide an insight on pavement designing, its planning, its components and its characteristics	Student will able to acquire and apply knowledge of pavement, its planning, its design, its

		Explain sampling of data, analysis and interpretation of data in conducting various survey	applications, its components and its characteristics
<b>AUMTCE-305(T)</b>	<b>Pre Thesis</b>	To provide basic knowledge of thesis work to the students	Able to apply various methodologies, strategies related to thesis
<b>3<sup>RD</sup> SEMESTER</b>			
<b>ENVIRONMENTAL ENGINEERING</b>			
<b>AUMTCE-301(E)</b>	<b>Renewable Energy</b>	Provide an insight on Renewable energy resources, its planning, its components and its characteristics	Able to acquire and apply knowledge of Renewable energy resources, its planning, its components and its characteristics
<b>AUMTCE-302(E)</b>	<b>Remote Sensing &amp; GIS</b>	Provide an insight on GIS, its planning, its applications, its components and its characteristics  Explain sampling of data, analysis and interpretation of data in conducting various survey	Able to acquire and apply knowledge of GIS, its planning, its applications, its components and its characteristics  Able to apply the knowledge of sampling data in conducting various surveys and analysis
<b>AUMTCE-303(E)</b>	<b>Water Resources Planning and Management</b>	To understand the concept of planning of water resources projects including feasibility studies and to learn the concept of relevant mathematical tools.  To understand the concept of project analysis, issues in planning and data needed for planning.	Able to make use of concept of planning, optimal design criteria and application of economics in water resources projects.  Able to apply the concepts of linear and dynamic programming in real life problems.
<b>AUMTCE-304(E)</b>	<b>Environmental Impact Assessment</b>	Provide an insight on environmental impact assessment, its planning, its components and its characteristics	Familiarization with various problems related to environmental health and social issues

<b>AUMTCE-305(E)</b>	<b>Pre Thesis</b>	To provide basic knowledge of thesis work to the students	Able to apply various methodologies, strategies related to thesis
<b>3<sup>RD</sup> SEMESTER CONSTRUCTION TECHNOLOGY ENGINEERING</b>			
<b>AUMTCE-301(C)</b>	<b>Bridge Engineering</b>	Provide an insight on bridge infrastructure, its planning, its design, its applications, its components and its characteristics Explain sampling of data, analysis and interpretation of data in conducting various survey	Student will able to acquire and apply knowledge of bridge infrastructure, its planning, its design, its applications, its components and its characteristics
<b>AUMTCE-302(C)</b>	<b>Remote Sensing &amp; GIS</b>	Provide an insight on GIS, its planning, its applications, its components and its characteristics Explain sampling of data, analysis and interpretation of data in conducting various survey	Able to acquire and apply knowledge of GIS, its planning, its applications, its components and its characteristics  Able to apply the knowledge of sampling data in conducting various surveys and analysis
<b>AUMTCE-303(C)</b>	<b>Design of Pre-stressed Concrete Structures</b>	Provide an insight on pre-stressed concrete structural design, its planning, its design, its applications, its components and its characteristics Explain sampling of data, analysis and interpretation of data in conducting various survey	Student will able to acquire and apply knowledge of pre- stressed concrete Structures its components and its characteristics
<b>AUMTCE-304(C)</b>	<b>Concrete Technology</b>	Provide an insight on various concrete related technologies, its planning, its design, its applications, its components and its characteristics Explain sampling of data, analysis and interpretation of data in conducting various survey	Understand the principles of concrete technology and apply them during construction supervision and testing. Supervise and manage concrete manufacturing and construction.
<b>AUMTCE-305(C)</b>	<b>Pre Thesis</b>	To provide basic knowledge of thesis work to the students	Able to apply various methodologies, strategies related to thesis

<b>4TH SEMESTER</b>			
<b>AUMTCE-401</b>	<b>Thesis /Dissertation</b>	To provide brief knowledge of thesis work to the students	Able to apply various methodologies, strategies related to thesis Able to summarize and analyze the data collected

**M-TECH COMPUTER SCIENCE ENGINEERING SYLLABUS OUTCOMES AND OBJECTIVES**

SUBJECT CODE	SUBJECT NAME	OBJECTIVES	OUTCOMES
<b>1<sup>ST</sup> SEMESTER</b>			
<b>AUMTCSE-101</b>	<b>Big Data Analytics</b>	<ul style="list-style-type: none"> <li>To provide an overview of an exciting growing field of big data analytics.</li> <li>To introduce the tools required to manage and analyze big data like Hadoop, NoSQL, Map Reduce.</li> <li>To teach the fundamental techniques and principles in achieving big data analytics with scalability and streaming capability.</li> </ul> <p>To enable students to have skills that will help them to solve complex real-world problems in for decision support.</p>	<ul style="list-style-type: none"> <li>Understand the key issues in big data management and its associated applications in intelligent business and scientific computing.</li> <li>Acquire fundamental enabling techniques and scalable algorithms like Hadoop, Map Reduce and NO SQL in big data analytics.</li> <li>Interpret business models and scientific computing paradigms, and apply software tools for big data analytics.</li> </ul>
<b>AUMTCE/ME/CSE-102</b>	<b>Research Methodology</b>	<ul style="list-style-type: none"> <li>The method is supported by powerful optimization and numerical techniques, which allow us to work with bodies of complex initial design and with very fine finite-element meshes, giving thus quite accurate solutions even in "difficult" parts and for complex geometries.</li> </ul>	<ul style="list-style-type: none"> <li>Able to apply the knowledge of sampling data &amp; conducting various analysis.</li> </ul>
<b>AUMTCSE-103</b>	<b>Data Structure &amp; Algorithm Analysis in C</b>	<ul style="list-style-type: none"> <li>To teach various storage mechanisms of data.</li> <li>To design and implement various data structures.</li> <li>To introduce various techniques for representation of the data in the real world.</li> </ul>	<ul style="list-style-type: none"> <li>Students will be able to implement various linear and nonlinear data structures.</li> <li>Able to apply the knowledge of sampling data in conducting various surveys and analysis.</li> </ul>

			Students will be able to select appropriate sorting technique for given problem.
<b>AUMTCSE-104(A)</b>	<b>Software Engineering</b>	<ul style="list-style-type: none"> <li>• To provide the knowledge of software engineering discipline.</li> <li>• To apply analysis, design and testing principles to software project development.</li> <li>• To demonstrate and evaluate real time projects with respect to software engineering principles.</li> </ul>	<ul style="list-style-type: none"> <li>• Understand and demonstrate basic knowledge in software engineering.</li> <li>• Identify requirements, analyze and prepare models.</li> <li>• Identify risks, manage the change to assure quality in software projects.</li> </ul>
<b>AUMTCSE-104(B)</b>	<b>Advanced Software Engineering Concepts</b>	<ul style="list-style-type: none"> <li>• To demonstrate and evaluate real time projects with respect to software engineering principles.</li> <li>• To specify, abstract, verify and validate solutions to large-size problems, to plan, develop and manage large software and learn emerging trends in software engineering.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify and apply the principles, processes and main knowledge areas for Software Project Management.</li> <li>• Apply testing principles on software project and understand the maintenance concepts.</li> </ul>
<b>2<sup>ND</sup> SEMESTER</b>			
<b>AUMTCSE-201</b>	<b>Object Oriented Programming with JAVA</b>	<ul style="list-style-type: none"> <li>• To program using C++ features such as composition of objects, Operator overloading, inheritance, Polymorphism etc.</li> <li>• To understand the concept of object oriented programming, java elements.</li> </ul>	<ul style="list-style-type: none"> <li>• Be able to understand the difference between object oriented programming and procedural oriented language and data types in C++.</li> <li>• Be able to program using C++ features such as composition of objects, Operator overloading,</li> </ul>

			inheritance, Polymorphism etc.
<b>AUMTCSE-202</b>	<b>Computer Networks</b>	<ul style="list-style-type: none"> <li>• To get a basic introduction to key concepts and techniques underlying cellular communication and medium access control in wireless networks.</li> <li>• To learn the architecture and issues related to IEEE 802.11 wireless LAN.</li> <li>• To expose the students to various internetworking, routing and multicasting issues and protocols.</li> </ul>	<ul style="list-style-type: none"> <li>• Grasp the concepts and characteristics of wireless signals and transmission channels.</li> <li>• Identify and understand the various design issues of internetworking, routing and multicasting.</li> </ul>
<b>AUMTCSE-203</b>	<b>Distributed Data Base Management System</b>	<ul style="list-style-type: none"> <li>• To learn Distributed Database Management Systems (DDBMSs) features such as concurrency control, recovery control, transactional models, and query processing.</li> <li>• To learn advanced topics of databases like object-oriented, parallel and distributed databases.</li> <li>• To implement the concepts of decision-support models in various database applications</li> </ul>	<ul style="list-style-type: none"> <li>• Analyze the advanced concepts along with their application areas.</li> <li>• Design recovery protocols for distributed databases and parallel database architectures.</li> </ul>
<b>AUMTCSE-204(A)</b>	<b>Software Quality and Testing</b>	<ul style="list-style-type: none"> <li>• To provide the students with theoretical knowledge about concepts of software quality, about the quality models, standards and – methodologies used in software industry.</li> <li>• Understanding and usage of the theory is consolidated by the case studies and exercises.</li> <li>• To understand software and functional testing.</li> </ul>	<ul style="list-style-type: none"> <li>• To develop ability to analyze the relations among software product, process and project in quality assurance and management.</li> <li>• To understand the relationships between software process improvement and software quality management.</li> </ul>
<b>AUMTCSE-204(B)</b>	<b>Computer Architecture and Parallel Processing</b>	<ul style="list-style-type: none"> <li>• To provide students with a broad understanding of computer architecture.</li> </ul>	<ul style="list-style-type: none"> <li>• Understand the advanced concepts of computer</li> </ul>



		<ul style="list-style-type: none"> <li>To study architectures exploiting instruction-level parallelism (ILP), and multiprocessors and minicomputers.</li> <li>To provide exposure to current and emerging trends in Computer Architectures.</li> </ul>	<p>architecture.</p> <ul style="list-style-type: none"> <li>Investigate modern design structures of Pipelined and Multiprocessors systems.</li> <li>Understand the interaction amongst architecture, applications and technology.</li> </ul>
<b>3<sup>RD</sup> SEMESTER</b>			
<b>AUMTCSE-301</b>	<b>Artificial Intelligence &amp; Expert System</b>	<ul style="list-style-type: none"> <li>To understand the concept of AI and Expert Systems.</li> <li>To understand the insight of natural language processing.</li> </ul>	<ul style="list-style-type: none"> <li>Be able to understand the concept of AI, Expert Systems and NLP.</li> <li>Be able to use propositional logic and pragmatic processing.</li> </ul>
<b>AUMTCSE-302</b>	<b>Operating System and Case Study</b>	<ul style="list-style-type: none"> <li>To introduce advanced operating system concepts with emphasis on foundations &amp; design principles.</li> <li>Different components of operating system are covered.</li> </ul>	<ul style="list-style-type: none"> <li>Able to analyze the structure of operating systems and evaluate the relationship between the application programs that work on them.</li> <li>Able to review the state of art in operating systems design.</li> </ul>
<b>AUMTCSE-303</b>	<b>Data Warehousing and Data Mining</b>	<ul style="list-style-type: none"> <li>Compare and contrast different conceptions of data mining as evidenced in both research and application.</li> <li>Describe how to extend a relational system to find patterns using association rules.</li> <li>Evaluate methodological issues underlying the effective application of data mining.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate the knowledge gained through solving problems.</li> <li>Use of data mining tools during Projects to build reliable products, the current demand of the industry.</li> </ul>
<b>AUMTCSE-304(A)</b>	<b>Cloud Computing</b>	<ul style="list-style-type: none"> <li>An overview of the concepts, processes, and best practices needed to successfully secure</li> </ul>	<ul style="list-style-type: none"> <li>Identify security aspects of each cloud model.</li> </ul>

		<p>information within Cloud infrastructures.</p> <ul style="list-style-type: none"> <li>To learn the basic Cloud types and delivery models and develop an understanding of the risk and compliance responsibilities and Challenges for each Cloud type and service delivery model.</li> </ul>	<ul style="list-style-type: none"> <li>Develop a risk-management strategy for moving to the Cloud.</li> <li>Implement a public cloud instance using a public cloud service provider.</li> </ul>
<b>AUMTCSE-304(B)</b>	<b>Cyber Law</b>	<ul style="list-style-type: none"> <li>Examine how the online world has borne new crimes and law enforcement response.</li> <li>Gain insights to application of IT Laws for different types of cyber-crimes.</li> </ul>	<ul style="list-style-type: none"> <li>Analyze various types of cyber-crime and formulate real world cyber-crime investigations.</li> <li>Ability to find solutions in cyber-crime investigations, evidence and applicable law for real world case studies.</li> </ul>
<b>AUMTCSE-305</b>	<b>Pre Thesis</b>	<ul style="list-style-type: none"> <li>To provide basic knowledge of thesis work to the students</li> </ul>	<ul style="list-style-type: none"> <li>Able to apply various methodologies, strategies related to thesis</li> </ul>
<b>4TH SEMESTER</b>			
<b>AUMTCSE-401</b>	<b>Thesis /Dissertation</b>	<ul style="list-style-type: none"> <li>To provide brief knowledge of thesis work to the students</li> </ul>	<ul style="list-style-type: none"> <li>Able to apply various methodologies, strategies related to thesis</li> <li>Able to summarize and analyze the data collected</li> </ul>

## M-TECH MECHANICAL ENGINEERING SYLLABUS OUTCOMES AND OBJECTIVES

SUBJECT CODE	SUBJECT NAME	OBJECTIVES	OUTCOMES
<b>1<sup>ST</sup> SEMESTER</b>			
<b>AUMTME-101</b>	<b>Agriculture engineering</b>	To Provide an insight on Agricultural Engineering, management and its components,	Able to Understand the principles of Agricultural Engineering and apply them in the fields to enhance the production
<b>AUMTME-102</b>	<b>Research Methodology</b>	To provide an insight on various research needs, analysis and types	Able to apply the knowledge of sampling data & conducting various analysis
<b>AUMTME-103</b>	<b>Metal Casting</b>	Understand the principles of metal casting and apply them during factory supervision and testing.  Supervise and manage manufacturing process.	Information on various types, their physical and chemical properties including properties of metal casting as per BIS, ACI and British mix methods.
<b>AUMEME-104(A)</b>	<b>Welding Technology</b>	Understand the principles of welding technologies and apply them during factory supervision and testing.  Interpret the test results in accordance with BIS Stipulations.	Able to Plan the quality checks and perform various welding operations
<b>AUMEME-104(B)</b>	<b>Advance Mechatronics and Product Design</b>	Provide an insight on mechatronics, its components and its characteristics	Able to acquire and apply knowledge of mechatronics, its components and its characteristics Able to apply the knowledge of sampling data in conducting various surveys and analysis

<b>2<sup>ND</sup> SEMESTER</b>			
<b>AUMTME-201</b>	<b>Plastics and Composites</b>	Provide an insight on various plastics , its components and its characteristics  Explain sampling, treatment & composition.	Able to acquire and apply knowledge of various plastics , its management , its components and its characteristics
<b>AUMTME-202</b>	<b>Jig, Fixture and Die Design</b>	Gain knowledge concerning jig fixtures die design etc.	Familiarization with various problems related to jig fixtures and die design.
<b>AUMTME-203</b>	<b>Mechanization of Farm Power and Machinery</b>	Provide an insight on machinery, its planning, its components and its characteristics	Able to design and analyze various types of machines.
<b>AUMTME-204(A)</b>	<b>Production Planning and Control</b>	To provide an insight on various production planning techniques, coordination of materials, machines, tools and operating time	Able to acquire and apply knowledge of production planning and control, its components and its characteristics
<b>AUMTME-204(B)</b>	<b>Machine Tool Design</b>	To introduce the fundamentals of machine tools etc  To understand working and principles of various machine tool designs.	Able to analyze the fundamentals of machine tools etc  Able to apply the model results in verifying the analysis and design of machine tools.
<b>3<sup>RD</sup> SEMESTER</b>			
<b>AUMTME-301</b>	<b>Materials Technology</b>	Provide an insight on material technology, its planning, its components and its characteristics  Explain sampling of data, analysis and interpretation of data in conducting various survey	Able to acquire and apply knowledge of material technology, its components and its characteristics  Able to apply the knowledge of sampling data in conducting various surveys and analysis
<b>AUMTME-302</b>	<b>Industrial Tribology</b>	Provide an insight on industrial tribology, wear friction, lubrication its components and its characteristics	Able to acquire and apply knowledge on industrial tribology, wear friction, lubrication its components and its characteristics

<b>AUMTME-303</b>	<b>Operational Research</b>	The subject is supported by powerful optimization and numerical techniques, which allow us to work with bodies of complex initial design and with very fine finite-element meshes, giving thus quite accurate solutions even in "difficult" parts and for complex geometries.	Able to apply the knowledge of sampling data & conducting various analysis
<b>AUMTME-304(A)</b>	<b>Total Quality Management</b>	To provide management philosophy that focus on producing quality service to meet customer need	Able to apply the knowledge of various customer needs, finance, marketing and manufacturing etc
<b>AUMTME-304(B)</b>	<b>Entrepreneurship</b>	To provide management philosophy that focus on producing quality service to meet customer need. To provide insight on various market needs and business	Able to apply the knowledge of various customer needs, finance, marketing and manufacturing etc
<b>AUMTCE-305</b>	<b>Pre Thesis</b>	To provide basic knowledge of thesis work to the students	Able to apply various methodologies, strategies related to thesis
<b>4TH SEMESTER</b>			
<b>AUMTCE-401</b>	<b>Thesis /Dissertation</b>	To provide brief knowledge of thesis work to the students	Able to apply various methodologies, strategies related to thesis Able to summarize and analyze the data collected

<b>PhD MECHANICAL</b>		
<b>SUBJECT CODE</b>	<b>SUBJECT NAME</b>	<b>COURSE OUTCOMES</b>
AUPH DRM-101	Research Methodology	Able to apply the knowledge of sampling data & conducting various analysis
AURPE-04	Research & Publication Ethics	
AUPHDME-103(A)	Applied Mechanics and Design	Student will able to solve various problems related to physical materials of daily life
AUPHDME-103(B)	Fluid Mechanics and Thermal Sciences	Student will able to solve various problems related to fluid properties, statistics, measurements flow through pipes
AUPHDME-104(A)	Material, Manufacturing and Industrial Engineering	Able to acquire and apply knowledge of material technology, its components and its characteristics Able to apply the knowledge of sampling data in conducting various surveys and analysis
AUPHDME-104(B)	Industrial Tribology	Able to acquire and apply knowledge on industrial tribology, wear friction, lubrication its components and its characteristics
AUPHDME-105	Seminar and Presentation	Student will able to enhance their presentation, discussion, learning & listening skills. Will able to learn argument and questioning techniques etc.
<b>PhD COMPUTER SCIENCE ENGINEERING</b>		
AUPH DRM-101	Research Methodology	Able to apply the knowledge of sampling data & conducting various analysis
AURPE-04	Research & Publication Ethics	
AUPHDCSE-103(A)	Cloud Computing	To explain the core issues of cloud computing such as security, privacy, and interoperability. Choose the appropriate technologies, algorithms, and approaches for the related issues. identify problems, and explain, analyze, and evaluate various cloud computing solutions
AUPHDCSE-103(B)	Advance Software Engineering	Basic knowledge and understanding of the analysis and design of complex systems. Ability to apply software engineering principles and techniques. Ability to develop, maintain and evaluate large-scale software systems.
AUPHDCSE-104(A)	Software Testing and Auditing	Ability to apply software engineering principles and techniques. Ability to develop, maintain and evaluate large-scale software systems.
AUPHDCSE-104(B)	Theory of Computation	To introduce students about the mathematical foundations of computation including

		automata theory; the theory of formal languages and grammars; the notions of algorithm, decidability, complexity, and computability.
<b>AUPHDCSE-105</b>	<b>Seminar and Presentation</b>	Student will able to enhance their presentation, discussion, learning & listening skills. Will able to learn argument and questioning techniques etc.
<b>PhD CIVIL ENGINEERING</b>		
<b>AUPH DRM-101</b>	<b>Research Methodology</b>	Able to apply the knowledge of sampling data & conducting various analysis
<b>AURPE-04</b>	<b>Research &amp; Publication Ethics</b>	
<b>AUPHDCE-103(A)</b>	<b>Advance Concrete Technology</b>	Information on various ingredients, their physical and chemical properties including properties of green and hardened concrete Mix design procedures as per BIS, ACI and British mix methods, including design of concrete using fibers and mineral architecture.
<b>AUPHDCE-103(B)</b>	<b>Repair &amp; Rehabilitation of Structure</b>	Student will able to acquire and apply knowledge of repair & rehabilitation techniques & estimation of quantities and will able to analysis rates and valuations of different materials related to construction and repair.
<b>AUPHDCE-104A)</b>	<b>Composite Material</b>	Able to Plan the quality checks and bring about economy in concrete construction.
<b>AUPHDCE-104(B)</b>	<b>Structural Engineering</b>	Student will able to solve various problems related to physical and mechanical aspects of civil constructions

## **Ph.D in Pharmacy**

### **Program Outcome:**

- The scholastic educational module and research programs have been structured with refreshed information with the essential concentration to rudiments and developing fields of Pharmacy.
- Research regions in the division essentially centre around different pharmaceutical medication conveyance frameworks, novel medication conveyance frameworks, phytochemistry, institutionalization and quality control of home grown medications, and other push regions of Pharmaceutical Research.
- The programme consistently distributes their exploration research in reputed national and international journals.
- The course concentrates on research and coursework identifying with the improvement, creation and portrayal of measurement shapes, just as the aura and activity of medications in the body.
- The group based way to deal with medication conveyance, grasping an assortment of exercises in the wide region of medication definition and conveyance.
- The department works towards promoting multidisciplinary, team-based approach to drug delivery, embracing a variety of activities in the broad area of drug formulation and delivery.
- Major areas of emphasis include quality education with professionalism by considering the recent demands in different aspect of pharmaceutical fields.

### **Programme Specific Outcomes**

- The ultimate destination for quality education, practical based training and research in pharmaceutical technology and allied areas for the well-being of people.
- Provide qualified personnel who can take up responsibilities as pharmaceutical sciences professionals, suitable for community, industries and institutions.
- Provide infrastructure and research facilities to disseminate the advanced knowledge to the students in various branches pharmaceutical sciences through innovative teaching learning processes with inter-disciplinary approach such that they grow their wisdom to 3 acquire all kinds of knowledge and generate new ideas.
- Educate and train manpower for the development of the country and establish linkages with industries for the promotion of science and technology.
- Develop the spirit of internationalism and competitiveness in students such that they develop new original ideas and make new discoveries and inventions to make a strong society.
- Encourage students for, acquiring self-confidence, self- respect and self-dependence and instill moral values in students making them well disciplined and pay special attention to the improvement of the social and economic conditions.



## **Course Outcomes**

### **AUPH-101-Research Methodology**

- Students should understand a general definition of research design.
- Students should know why educational research is undertaken, and the audiences that profit from research studies.
- Students should be able to identify the overall process of designing a research study from its inception to its report.
- Students should be familiar with ethical issues in educational research, including those issues that arise in using quantitative and qualitative research.
- Students should know the primary characteristics of quantitative research and qualitative research.
- Students should be able to identify a research problem stated in a study.
- Students should be familiar with how to write a good introduction to an educational research study and the components that comprise such an introduction.
- Students should be familiar with conducting a literature review for a scholarly educational study:
  - a. The steps in the overall process.
  - b. The types of databases often searched.
  - c. The criteria for evaluating the quality of a study.
  - d. The ways of organizing the material found.
  - e. The different types of literature reviews.

## **Course Outcomes**

### **AUPH-102-Advances in pharmaceutical sciences**

- Important for achieving a better understanding of the interrelationship between intracellular activity and function of engineered nanomaterials, which is needed for nanoparticle drug-delivery systems.

## **Course Outcomes**

### **AUPH-103-Advance Pharmacology**

- Understand the pharmacological actions of different categories of drugs
- Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels.
- Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.
- Observe the effect of drugs on animals by simulated experiments
- Appreciate correlation of pharmacology with other bio medical sciences.

## **Course Outcomes**

### **AUPH-103-Pharmaceutical Product Development**

- develop familiarity with models of innovation and the marketing and technology interface
- understand the importance of new product development to firm performance
- learn methods of generating, evaluating and testing product ideas
- learn methods of evaluating and monitoring the success of a launch

## Course Outcomes

### AUPH-103-Advance Pharmaceutical Chemistry

- Learn the different stages of drug discovery & Role of medicinal chemistry in drug research
- Learn different techniques for drug discovery
- Understand various strategies to design and develop a new drug like molecules for biological targets
- Explain drug receptor concept
- Elaborate prodrug development and applications
- Learn the structural activity relationship of the important class of drugs
- Explain types of Enzyme inhibition and its application in medicine
- Discuss peptidomimetics approach and applications

## Course Outcomes

### **AURPE-04- RESEARCH AND PUBLICATION ETHICS**

- To propose and test certain hypotheses to provide causal relationships between certain variables
- To discover and establish the existence of relationship, association, and independence between two or more aspects of a particular situation or phenomenon
- To understand different phenomenon and develop new perceptions about it
- To study and describe accurately the characteristics of situations, problems, phenomena, services, groups, or individuals
- To explain unexplored horizons of knowledge
- To test reported findings and conclusions on new data and novel conclusions on previously reported data
- To study the frequency of research that is connected with unspecified objectives

# **M.A. Education**

## **1<sup>st</sup> Year Courses**

### **Course Code: AUPHEDU-101                      Philosophical and Social Foundations of Education**

Course Outcomes:

To enable the learners to:

- Describe the Philosophical Perspectives of Education.
- Understand Education as the discipline and the aims of Education, basic tenants of varying thoughts of Indian Philosophical Schools and their implication for improving the present system of Education in the country.
- To develop depth understanding about contemporary Indian Education system.
- To develop the knowledge about Indian thought and its contribution to educational practices
- To develop the knowledge about social change.
- To enable the students to understand the concept of Educational Sociology and Sociology in Education.

### **Course Code: AUPHEDU-102                      Methodology of Educational research**

Course Outcomes:

To enable the learners to:

- Understand the basics concept of Educational Research.
- Students will be able to understand various sampling techniques along with sampling errors.
- Students will be able to describe the various types of tools used in research along with their construction, validation, standardization and uses.
- Students will be able to describe the different methods of educational research.
- Students will be able to understand the characteristics of an experiment, concept of experimental designs and different types of experimental designs along with their merits and limitations.
- To make the students to understand the organization, analysis, interpretation and validation of qualitative data.
- Students will be able to understand the theory and computation involved in different types of quantitative data.

### **Course Code: AUPHEDU-103                      Teacher Education**

Course Outcomes:

To enable the learners to:

- Understand the concept and scope of Teacher Education in India with the Historical Perspectives.
- Understand the Concept, Development and Agencies of Teacher Education.
- Understand the Aims and Objectives of Teacher Education at Elementary and Secondary Levels.
- Understand the Recommendations of Various Commissions for Teacher Education and Role of NCTE.
- Understand the Different Teacher Education Programmes and their Utility.

- Understand the Current scenario of Teacher Education in India.
- Understand the Problems of Teacher Education in India.
- Understand the Issues, Problems and Innovative Practices in Teacher Education.
- Research and Professionalism in Teacher Education.

**Course Code: AUPHEDU-104 Research and Publication Ethics**

Course Outcomes:

To enable the learner to:

1. Understanding of ethical issues related to Research and Publication.
2. Understand Patents and rights.
3. Understand IPR – Intellectual Property Rights
4. Write research papers/thesis following publication ethics and Related issues.
5. Develop Competencies for Publishing ethically and avoiding plagiarism.

<b>PhD MECHANICAL</b>		
<b>SUBJECT CODE</b>	<b>SUBJECT NAME</b>	<b>COURSE OUTCOMES</b>
AUPH DRM-101	Research Methodology	Able to apply the knowledge of sampling data & conducting various analysis
AURPE-04	Research & Publication Ethics	Knowledge of ethics in research and publications
AUPHDME-103(A)	Applied Mechanics and Design	Student will able to solve various problems related to physical materials of daily life
AUPHDME-103(B)	Fluid Mechanics and Thermal Sciences	Student will able to solve various problems related to fluid properties, statistics, measurements flow through pipes
AUPHDME-104(A)	Material, Manufacturing and Industrial Engineering	Able to acquire and apply knowledge of material technology, its components and its characteristics Able to apply the knowledge of sampling data in conducting various surveys and analysis
AUPHDME-104(B)	Industrial Tribology	Able to acquire and apply knowledge on industrial tribology, wear friction, lubrication its components and its characteristics
AUPHDME-105	Seminar and Presentation	Student will able to enhance their presentation, discussion, learning & listening skills. Will able to learn argument and questioning techniques etc.
<b>PhD COMPUTER SCIENCE ENGINEERING</b>		
AUPH DRM-101	Research Methodology	Able to apply the knowledge of sampling data & conducting various analysis
AURPE-04	Research & Publication Ethics	Knowledge of ethics in research and publications
AUPHDCSE-103(A)	Cloud Computing	To explain the core issues of cloud computing such as security, privacy, and interoperability. Choose the appropriate technologies, algorithms, and approaches for the related issues. identify problems, and explain, analyze, and evaluate various cloud computing solutions
AUPHDCSE-103(B)	Advance Software Engineering	Basic knowledge and understanding of the analysis and design of complex systems. Ability to apply software engineering principles and techniques. Ability to develop, maintain and evaluate large-scale software systems.
AUPHDCSE-104(A)	Software Testing and Auditing	Ability to apply software engineering principles and techniques. Ability to develop, maintain and evaluate large-scale software systems.
AUPHDCSE-104(B)	Theory of Computation	To introduce students about the mathematical foundations of computation including

		automata theory; the theory of formal languages and grammars; the notions of algorithm, decidability, complexity, and computability.
<b>AUPHDCSE-105</b>	<b>Seminar and Presentation</b>	Student will able to enhance their presentation, discussion, learning & listening skills. Will able to learn argument and questioning techniques etc.
<b>PhD CIVIL ENGINEERING</b>		
<b>AUPHDRM-101</b>	<b>Research Methodology</b>	Able to apply the knowledge of sampling data & conducting various analysis
<b>AURPE-04</b>	<b>Research &amp; Publication Ethics</b>	Knowledge of ethics in research and publications
<b>AUPHDCE-103(A)</b>	<b>Advance Concrete Technology</b>	Information on various ingredients, their physical and chemical properties including properties of green and hardened concrete Mix design procedures as per BIS, ACI and British mix methods, including design of concrete using fibers and mineral architecture.
<b>AUPHDCE-103(B)</b>	<b>Repair &amp; Rehabilitation of Structure</b>	Student will able to acquire and apply knowledge of repair & rehabilitation techniques & estimation of quantities and will able to analysis rates and valuations of different materials related to construction and repair.
<b>AUPHDCE-104A)</b>	<b>Composite Material</b>	Able to Plan the quality checks and bring about economy in concrete construction.
<b>AUPHDCE-104(B)</b>	<b>Structural Engineering</b>	Student will able to solve various problems related to physical and mechanical aspects of civil constructions

## **Ph.D in Chemistry**

### **Programme Outcomes**

**PO1:** Theoretical knowledge on different frontier aspects of chemical sciences

**PO2:** Advanced courses on different aspects of chemical sciences Skill developed

**PO3:** Hands on training on advance instruments for chemical analysis

**PO4:** Computer application in chemical sciences

**PO5:** To choose a research problem following up to date scientific literature Competency developed

**PO6:** To handle frontier area research problem independently

### **Course Outcomes**

#### **AUPHDCHI-01-Techniques in Biological Research**

- The properties of biomolecules that are used for their analysis
- The principle concepts in using analytical and preparatory techniques
- How to quantify and assay for a biomolecule

### **Course Outcomes**

#### **AUPHDCHI-02-Advances in Nanomaterials and Chemistry of Life Processes**

- Get to know the representation of small molecules and proteins
- Able to understand the drug discovery process, Have practical exposure of in-silico drug design

### **Course Outcomes**

#### **AUPHDCHI-03-Inorganic Chemistry in Biological Systems**

- To understand the relevance, basic concepts of transplantation immunology
- To understand the relevance, basic concepts of antibody engineering
- To utilize the knowledge to understand the mechanisms of immune reactions against grafts and transplants
- To utilize the knowledge to understand the approaches to antibody engineering
- students will be able to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments

### **Course Outcomes**

#### **AUPHDCHI-04-Polymer Chemistry**

- Different kind of polymers and their properties.
- Concept of Molecular Weight and distribution.
- Variation of properties of polymer by crystallinity and glass transition temperature.
- Process of polymer degradation.
- Behaviors of polymer solution at different concentrations

## **Course Outcomes**

### **AUPHDCHI-05-Non-Equilibrium Physical Chemistry and Theoretical and Applied Aspects of Surfactant Systems**

- Students will appreciate the central role of chemistry in our society and use this as a basis for ethical behavior in issues facing chemists including an understanding of safe handling of chemicals, environmental issues and key issues facing our society in energy, health and medicine.
- Students will be able to explain why chemistry is an integral activity for addressing social, economic, and environmental problems.

## **Course Outcomes**

### **AURPE 04-Research and Publication ethics**

- To understand the relevance, basic concepts, theories and approaches towards research project planning, execution, report submissions and research publications }
- To utilize the understanding (as above) for applications in all areas of research methodology
- To be able to integrate the theory concepts to real-time research situations/examples/case-studies



## **Ph.D in Education**

### **Programme Outcomes**

**PO1:** Analyze and critically evaluate educational theories, policies, research and practices intended to improve equity and social justice.

**PO2:** Collaborate with others to set direction, design and enact improvements as a leader in education, work or community settings.

**PO3:** Apply principles of individual and organizational learning to effect positive change.

**PO4:** Design and conduct research and inquiry to improve practice and promote equity.

**PO5:** Communicate effectively to scholarly and practitioner audiences.

### **Programme Specific Outcomes**

**PSOs1:** Apply theories of learning and development to understand fundamental questions involving education, communities, and/or families.

**PSOs2:** Identify and analyze an issue related to equity.

**PSOs3:** Apply a critical lens to interrogate existing research and theoretical perspectives.

**PSOs4:** Critically apply theories, methods, and knowledge to address questions in their primary field.

**PSOs5:** Demonstrate skills and knowledge at a level required for college and university teaching

**PSOs6:** Plan and conduct research of significance

**PSOs7:** Demonstrate skills in oral and written communication sufficient to publish and present work in their field or prepare grant proposals

### **COURSE OUTCOMES**

#### **AUPHEDU-101- Philosophical and Social Foundations of Education**

- To enable the student to understand the philosophical and sociological origins of education.
- Logical analysis, interpretation and synthesis of various concepts, proposition and Philosophical assumptions about educational phenomena.
- To help the student to develop a philosophical and sociological outlook towards educational problems.
- Critical appraisal of contributions made to education by prominent educational thinkers

#### **AUPHEDU-102- Methodology of Educational Research**

- To explain the concept of Educational Research
- To describe the scope of Educational Research
- To state the purpose of Educational Research
- To explain what is scientific enquiry.
- To explain importance of theory development.
- To explain relationship among science, education and educational research.

- To Identify fundamental research

#### **AUPHEDU-103- Teacher Education**

- Demonstrate an understanding of the several different senses of education, including education as experience, education as upbringing, education as character building, education as intellectual development, education as personal discovery, education as institutional achievement, education as social praxis;
- Explain and analyse competing theories of education, especially education as an instrument for the achievement of societal ends; education as an intrinsic good; education as harmonization with community values; and education as the development and empowering of individual autonomy;
- Develop an ability to employ aspects of philosophical analysis and reasoning, as well as critical thinking skills, in the context of writing about the philosophy of education.

#### **AURPE-04- RESEARCH AND PUBLICATION ETHICS**

- To propose and test certain hypotheses to provide causal relationships between certain variables
- To discover and establish the existence of relationship, association, and independence between two or more aspects of a particular situation or phenomenon
- To understand different phenomenon and develop new perceptions about it
- To study and describe accurately the characteristics of situations, problems, phenomena, services, groups, or individuals
- To explain unexplored horizons of knowledge
- To test reported findings and conclusions on new data and novel conclusions on previously reported data
- To study the frequency of research that is connected with unspecified objectives

## **Ph.D in Management**

### **Programme Outcomes**

**PO1:** Understand the concepts related to Business.

**PO2:** Demonstrate the roles, skills and functions of management.

**PO3:** Analyze effective application of PPM knowledge to diagnose and solve organizational problems and develop optimal managerial decisions.

**PO4:** Understand the complexities associated with management of human resources in the organizations and integrate the learning in handling these complexities.

### **Programme Specific Outcomes:**

**PSO1:**To help the students gain understanding of the functions and responsibilities of managers.

**PSO2:**To provide them tools and techniques to be used in the performance of the managerial job.

**PSO3:**To enable them to analyze and understand the environment of the organization.

**PSO4:** To help the students to develop cognizance of the importance of management principles.

## **Course Outcomes**

### **AUPHDMGT-01- Research Methodology**

- Meaning & Importance of Research, Objectives of Research, Critical Thinking of research; Types of Research in Social Sciences, Research Process, Criteria for good Research.

## **Course Outcomes**

### **AUPHDMGT-02- Management Thought and Theory**

- To help the students gain understanding of the functions and responsibilities of managers.
- To provide them tools and techniques to be used in the performance of the managerial job.
- To enable them to analyze and understand the environment of the organization.
- To help the students to develop cognizance of the importance of management principles.

### **Course Outcomes**

#### **AUPHDMGT-03- Contemporary Issues in HRM**

- Explain the concept of human resource management
- Describe the functions of human resource management
- Explain the concept of people analytics
- Identify the use of people analytics in strategy
- Discuss human capital trends
- Discuss the benefits & challenges of a diverse workforce
- Discuss how to promote diversity within your organization
- Highlight current diversity-related trends

### **Course Outcomes**

#### **AUPHDMGT-03- Contemporary Issues in Finance**

- Describe the nature of different types of managerial approaches adopted by organisations in contemporary time
- Understand the purpose of different types of contemporary managerial approaches
- Examine the different ways that organisations can implement these contemporary managerial approaches in the workplace.

### **Course Outcomes**

#### **AUPHDMGT-03- Contemporary Issues in Marketing**

- Explain the purpose of segmentation and targeting in marketing
- Describe common segmentation approaches
- Explain the process of selecting an appropriate segmentation approach and deciding which customer segments to target for marketing activities
- Explain how targeting influences each element of the marketing mix
- Explain the role of marketing information in helping firms understand and reach consumers
- Describe the key types of marketing information including internal data, competitive intelligence and marketing research
- Outline a standard process for using marketing research to address an organization's strategic questions

- Recognize alternative methods for conducting marketing research, including primary and secondary research methods

### **Course Outcomes**

#### **AURPE-04- RESEARCH AND PUBLICATION ETHICS**

- To propose and test certain hypotheses to provide causal relationships between certain variables
- To discover and establish the existence of relationship, association, and independence between two or more aspects of a particular situation or phenomenon
- To understand different phenomenon and develop new perceptions about it
- To study and describe accurately the characteristics of situations, problems, phenomena, services, groups, or individuals
- To explain unexplored horizons of knowledge
- To test reported findings and conclusions on new data and novel conclusions on previously reported data
- To study the frequency of research that is connected with unspecified objectives

## **Ph.D in Pharmacy**

### **Program Outcome:**

- The scholastic educational module and research programs have been structured with refreshed information with the essential concentration to rudiments and developing fields of Pharmacy.
- Research regions in the division essentially centre around different pharmaceutical medication conveyance frameworks, novel medication conveyance frameworks, phytochemistry, institutionalization and quality control of home grown medications, and other push regions of Pharmaceutical Research.
- The programme consistently distributes their exploration research in reputed national and international journals.
- The course concentrates on research and coursework identifying with the improvement, creation and portrayal of measurement shapes, just as the aura and activity of medications in the body.
- The group based way to deal with medication conveyance, grasping an assortment of exercises in the wide region of medication definition and conveyance.
- The department works towards promoting multidisciplinary, team-based approach to drug delivery, embracing a variety of activities in the broad area of drug formulation and delivery.
- Major areas of emphasis include quality education with professionalism by considering the recent demands in different aspect of pharmaceutical fields.

### **Programme Specific Outcomes**

- The ultimate destination for quality education, practical based training and research in pharmaceutical technology and allied areas for the well-being of people.
- Provide qualified personnel who can take up responsibilities as pharmaceutical sciences professionals, suitable for community, industries and institutions.
- Provide infrastructure and research facilities to disseminate the advanced knowledge to the students in various branches pharmaceutical sciences through innovative teaching learning processes with inter-disciplinary approach such that they grow their wisdom to 3 acquire all kinds of knowledge and generate new ideas.
- Educate and train manpower for the development of the country and establish linkages with industries for the promotion of science and technology.
- Develop the spirit of internationalism and competitiveness in students such that they develop new original ideas and make new discoveries and inventions to make a strong society.
- Encourage students for, acquiring self-confidence, self- respect and self-dependence and instill moral values in students making them well disciplined and pay special attention to the improvement of the social and economic conditions.

## **Course Outcomes**

### **AUPH-101-Research Methodology**

- Students should understand a general definition of research design.
- Students should know why educational research is undertaken, and the audiences that profit from research studies.
- Students should be able to identify the overall process of designing a research study from its inception to its report.
- Students should be familiar with ethical issues in educational research, including those issues that arise in using quantitative and qualitative research.
- Students should know the primary characteristics of quantitative research and qualitative research.
- Students should be able to identify a research problem stated in a study.
- Students should be familiar with how to write a good introduction to an educational research study and the components that comprise such an introduction.
- Students should be familiar with conducting a literature review for a scholarly educational study:
  - a. The steps in the overall process.
  - b. The types of databases often searched.
  - c. The criteria for evaluating the quality of a study.
  - d. The ways of organizing the material found.
  - e. The different types of literature reviews.

## **Course Outcomes**

### **AUPH-102-Advances in pharmaceutical sciences**

- Important for achieving a better understanding of the interrelationship between intracellular activity and function of engineered nanomaterials, which is needed for nanoparticle drug-delivery systems.

## **Course Outcomes**

### **AUPH-103-Advance Pharmacology**

- Understand the pharmacological actions of different categories of drugs
- Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels.
- Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.
- Observe the effect of drugs on animals by simulated experiments
- Appreciate correlation of pharmacology with other bio medical sciences.

## **Course Outcomes**

### **AUPH-103-Pharmaceutical Product Development**

- develop familiarity with models of innovation and the marketing and technology interface
- understand the importance of new product development to firm performance
- learn methods of generating, evaluating and testing product ideas
- learn methods of evaluating and monitoring the success of a launch

## Course Outcomes

### AUPH-103-Advance Pharmaceutical Chemistry

- Learn the different stages of drug discovery & Role of medicinal chemistry in drug research
- Learn different techniques for drug discovery
- Understand various strategies to design and develop a new drug like molecules for biological targets
- Explain drug receptor concept
- Elaborate prodrug development and applications
- Learn the structural activity relationship of the important class of drugs
- Explain types of Enzyme inhibition and its application in medicine
- Discuss peptidomimetics approach and applications

## Course Outcomes

### **AURPE-04- RESEARCH AND PUBLICATION ETHICS**

- To propose and test certain hypotheses to provide causal relationships between certain variables
- To discover and establish the existence of relationship, association, and independence between two or more aspects of a particular situation or phenomenon
- To understand different phenomenon and develop new perceptions about it
- To study and describe accurately the characteristics of situations, problems, phenomena, services, groups, or individuals
- To explain unexplored horizons of knowledge
- To test reported findings and conclusions on new data and novel conclusions on previously reported data
- To study the frequency of research that is connected with unspecified objectives



## **Ph.D in Zoology**

### **Program Outcome**

**PO1.**Apply the knowledge of various branches of Zoology and General biology meant both for a graduate terminal course and for higher studies.

**PO2 .**Develop positive attitude towards sustainable development

**PO3.**Understand the unity of life with the rich diversity of organisms and their ecological and evolutionary significance

**PO4.**Acquire basic skills in the observation and study of nature, biological techniques, experimental skills and scientific investigation

### **Program specific Outcomes:**

**PSO1.**Identify and list out common animals

**PSO2.**Explain various physiological changes in our bodies

**PSO3.**Analyze the impact of environment on our bodies

**PSO4.**Understand various genetic abnormalities

**PSO5.**Develop respect for nature

**PSO6.**Explain the role and impact of different environmental conservation programmes

**PSO7.**Identify animals beneficial to humans

**PSO8.**Identify various potential risk factors to health of humans

**PSO9.**Explain the importance of genetic engineering

**PSO10.** Use tools of information technology for all activities related to zoology

## **Course Outcomes**

### **AUZooMP 101- TECHNIQUES IN BIOLOGICAL RESEARCH**

- Obtain a general knowledge of the basic principles of biological systems through a series of required courses in Genetics, Cell Biology, Biochemistry, and Evolution.
- Obtain depth of knowledge in a selected area of biology through upper level courses.
- Develop skills in analytical thinking through problem-based assignments and exams and laboratory exercises.
- Develop skills in the use of current methodology and investigation through laboratory courses.

### **Course Outcomes**

#### **AUZooMP 102: RECENT ADVANCES IN ZOOLOGY**

- Opportunities of continuing education and professional development.
- Widen the scope of the learners for careers in different sectors of employment.
- Enable the students to avail career opportunities in teaching, industry and research.

### **Course Outcomes**

#### **AUZooMP 103 - ADVANCED TOPICS IN PARASITOLOGY**

- distinguish the individual parasitic infectious diseases.
- recognize the protozoan infectious diseases.
- explain the methods used for diagnosis and treatment of protozoan infectious diseases.
- recognize the protozoan infectious agents of individual flora regions of human body.
- distinguish the individual helminthic infectious diseases.

### **Course Outcomes**

#### **AUZooMP 103 - ADVANCED TOPICS IN ENDOCRINOLOGY**

- The course aims to provide students with a broad understanding of the major human endocrine glands and their hormones, together with understanding hormones action and their effect on target cell. In addition, the course aims to provide students with understanding of the medical conditions resulted from abnormal hormone secretion and the laboratory tests that are used to diagnose these conditions.

### **Course Outcomes**

#### **AUZooMP 103-ADVANCED TOPICS IN ENTOMOLOGY**

- Attain a solid foundation in insect biology, including general entomology, basic systematics, morphology, physiology, and biodiversity.
- Understand evolution and biodiversity generation through macro- and micro-evolutionary processes, including how these processes have formed and diversified insects.
- Develop the ability to read and interpret scientific papers in entomology, and critically assess content.
- Attain skills in written and verbal scientific communication.
- Develop the ability to design and perform a scientific study on insects, and to analyze results.

## Course Outcomes

### **AURPE-04- RESEARCH AND PUBLICATION ETHICS**

- To propose and test certain hypotheses to provide causal relationships between certain variables
- To discover and establish the existence of relationship, association, and independence between two or more aspects of a particular situation or phenomenon
- To understand different phenomenon and develop new perceptions about it
- To study and describe accurately the characteristics of situations, problems, phenomena, services, groups, or individuals
- To explain unexplored horizons of knowledge
- To test reported findings and conclusions on new data and novel conclusions on previously reported data
- To study the frequency of research that is connected with unspecified objectives