**KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)**

*Re-accredited to NAAC with “A+” Grade (4th Cycle) College of Excellence (UGC)*

*Coimbatore – 641 029.*

**DEPARTMENT OF BIOCHEMISTRY (PG) COURSE OUTCOMES (CO) OF**

**M.Sc., BIOCHEMISTRY**

**For the students admitted in the year 2023-24**

**Sub. Code: 23PBC101**

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| --- | --- | --- | --- | --- |
| **Programme Code:** 07 | | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper:** Core Paper 1 – Biomolecules and Biopolymers | | | | |
| Batch 2023-2024 | Hours / Week 5 | | Total Hours 75 | Credits 4 |

***Course Objectives***

1. To learn about the chemistry and structures of Biomolecules
2. To know the properties of different Biomolecules
3. To know the physiological functions of Biomolecules

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Correlate the classification and functions of Biomolecules in energy Production. |
| CO2 | Apply the link between the structure and function of amino acids and Proteins in biological system. |
| CO3 | Able to know about execute of Biomolecules in human health |
| CO4 | Analyze and study the chemical and biochemical properties pharmacogenetics field |
| CO5 | Apply the structural studies to biological processes like replication, transcription and translation. |

**Sub. Code: 23PBC102**

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| --- | --- | --- | --- |
| **Programme Code:** 07 | | **Programme Title:** M.Sc Biochemistry | |
| **Title of the paper** Core Paper 2 – Bio analytical Techniques | | | |
| Batch 2023-2024 | Hours / Week 5 | Total Hours 75 | Credits 4 |

***Course Objectives***

1. To learn the principle and instrumentation of various separation techniques
2. To know the applications of various separation techniques in biological fields
3. To learn the concept of radioactivity and explore its role in various fields.

***Course Outcomes (CO)***

|  |  |  |  |
| --- | --- | --- | --- |
| K1 | CO1 | Recall the principle and applications of bioinstrumentation | |
|  | CO2 | The students will discern the principle, Instrumentation of different types | |
|  | of |  |
|  | Bio analytical techniques | |
|  | CO3 | The students also discern about applying the instrumentation | |
|  | techniques of Centrifugation, Electrophoresis and Chromatography in | |
|  | various research | |
|  | CO4 | The students will determine the knowledge and practice concerning | |
| K5 | modern analytical instrumentation and students can able to enter into | |
|  | large scale |  |
|  | Industries. |  |
|  | CO5 | Appreciate | the principle, instrumentation and difference  between various spectroscopic methods. |

# Sub.Code : 23PBC103

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| --- | --- | --- | --- |
| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper** Core Paper 3 – Enzymes and Enzyme Technology | | | |
| Batch 2023-2024 | Hours / Week 5 | Total Hours 75 | Credits 4 |

***Course Objectives***

* 1. To know the classification and properties of enzymes
  2. To learn about the mechanism of enzyme action
  3. To know the applications of enzymes in clinical and diagnostic fields

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Remember the fundamentals of enzyme properties |
| CO2 | Conceive the different procedures involved in enzyme technology |
| CO3 | Able to assay the enzyme and their kinetics and also apply to this in the  industry and other technological field |
| CO4 | Estimate enzyme technology for the commercialization purpose of biotechnological products |
| CO5 | Apply purification techniques of enzymes and immobilization techniques. |

**Sub code:23PBC104**

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| --- | --- | --- | --- |
| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper** Core Paper 4 – Cellular Biochemistry | | | |
| Batch  2023-2024 | Hours / Week  5 | Total Hours  75 | Credits  4 |

***Course Objectives***

1. To learn the models and functions of biological membrane
2. To learn about the structure and functions of cytoplasmic organelles
3. To learn the mechanism of membrane transport in cells

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Recall the basic concepts of cells. |
| CO2 | Understand the knowledge of cell structure and function |
| CO3 | Employ their knowledge of cell biology to selected examples of changes or  Losses in cell function. |
| CO4 | Analyze the cell structure, cell signaling and cell functions |
| CO5 | Decipher the intracellular signaling modes in mitochondria |

# Sub.Code: 23PBC1CL

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| --- | --- | --- | --- |
| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title :** Core Practical 1 – Biomolecules, Bioinstrumentation, Enzymology and  Cell Biology | | | |
| Batch  2023-2024 | Hours / Week  5 | Total Hours  75 | Credits  4 |

***Course Objectives***

* 1. To get practical experience in analyzing the biochemical metabolites in biological samples, bioinstrumentation, enzyme technology and cell biology techniques
  2. To have hands on experience on chromatography, electrophoresis, enzyme and cell biology techniques
  3. To develop familiarity with bioanalytical techniques and applications of enzyme and cell biology in research and industries

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Reproduce various concepts in Biomolecules, enzyme and cell biology. |
| CO2 | Conceive the amount of Biomolecules, isolation, purification and  determination of enzyme, preparation of buccal smears |
| CO3 | Apply the enzyme technology and cell biology skill in basic research  projects |
| CO4 | Assign the principles of Biomolecules, enzyme and cell biology  techniques to discovery novel drug development |
| CO5 | Be competent to perform various biochemical analysis. |

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**Sub.Code: 23PBC206**

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| --- | --- | --- | --- |
| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper:** Core Paper 5–Plant Biochemistry | | | |
| Batch  2023-2024 | Hours / Week  5 | Total Hours  75 | Credits  4 |

***Course Objectives***

* + 1. To learn the mechanism and importance of photosynthesis in plants
    2. To learn the role of hormones in the growth metabolism of plants
    3. To know the latest genetic engineering techniques for plant development

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Recall the biosynthesis of primary and secondary metabolites, nitrogen  metabolism involved in plants |
| CO2 | Understand the concept of plant tissue culture and plant transformation  techniques |
| CO3 | Know about applications of phytoconstituents in development of new  Drug |
| CO4 | Experiment on new technologies in plant biotechnology |
| CO5 | Evaluate various gene transfer techniques |

# Sub.Code: 23PBC206

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Programme C** | **ode:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper:** Core Paper 6 – Metabolism and Metabolic Regulation | | | | |
| Batch 2023-2024 | Hours / Week 5 | | Total Hours 75 | Credits 4 |

***Course Objectives***

* + - 1. To learn the metabolism of various Biomolecules in our system
      2. To provide a basic understanding of the biochemical reactions of molecules
      3. To study the interrelationship of various metabolic pathways

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Remember commemorate the overall concept of cellular metabolism |
| CO2 | Explain the metabolism of various biochemical pathways |
| CO3 | Execute the diseases associated with defective nucleotide biosynthesis |
| CO4 | Analyze the role of fat in energy production and membrane synthesis |
| CO5 | Define and explain the metabolism in various nutritional status and starvation. |

# Sub.Code :23PBC207

|  |  |  |  |
| --- | --- | --- | --- |
| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper:** Core Paper 7 –Molecular Biology | | | |
| Batch 2023-2024 | Hours / Week 5 | Total Hours 75 | Credits 4 |

***Course Objectives***

1. To understand the molecular organization of genes and chromosomes
2. To learn the process of DNA synthesis, repair and function
3. To learn the various molecular events occurring in DNA with proposed theories

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Able to define the basic concepts of gene |
| CO2 | Recognize the different processes involved in replication, transcription and  Translation |
| CO3 | Integrate scientific and technological knowledge on the use of genetics and molecular biology for industrial products on the cell and process level |
| CO4 | Examine the molecular mechanisms behind DNA damage and repair |
| CO5 | Appraise the various concepts of regulation of genes. |

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| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper:** Core Paper 8– Drug Biochemistry | | | |
| Batch 2023-2024 | Hours / Week 5 | Total Hours 75 | Credits 4 |

# Sub.Code :23PBC208

***CoursCourse Objectives***

* 1. To learn the mechanism of drug action in various diseases
  2. To learn about different drugs available for treatment
  3. To learn about the designing mechanisms for drug development

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Repeat the concept of pharmacology |
| CO2 | Describe the mechanism of action of drug inside the system |
| CO3 | Employ the drug discovery and drug design procedures. |
| CO4 | Examine the treatment of various disorders using drug molecules |
| CO5 | Contribute in understanding the mode of action of antibiotics. |

# Sub.Code:23PBC2CM

|  |  |  |  |
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| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper:** Core Practical 2 – Plant Biochemistry Genetics and Molecular Biology | | | |
| Batch 2023-2024 | Hours / Week 5 | Total Hours 75 | Credits 4 |

***Course Objectives***

1. To learn the techniques of plant tissue culture
2. To get an hands-on-training on molecular techniques
3. To implement the applications of plant tissue culture, microbes, genetics and molecular techniques in research and industries

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Correlate the principles of plant biochemistry, microbes, molecular biology  and genetic techniques |
| CO2 | Demonstrate the technical skills involved in plant tissue culture, counting  cells, identification of gene and its expressions |
| CO3 | Develop and apply the modern technology of plant biochemistry, microbial techniques, molecular biology and genetics in industries and research |
| CO4 | Examine the results obtained using plant biochemistry, sterilization  techniques, molecular biology and genetics |
| CO5 | Be competent in handling the microbial cultures and plant samples. |

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| --- | --- | --- | --- | --- |
| **Programme Code:** 07 | | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper:** Core Paper 9 – Advanced Immunology and immunological techniques | | | | |
| Batch 2023-2024 | Hours / Week 6 | | Total Hours 90 | Credits 5 |

# Sub.Code :23PBC309

***CoursCourse Objectives***

* 1. To learn about the various cells of immune system and their functions
  2. To know about the specificity of antigen-antigen interaction and their possible mechanisms
  3. To know the role of immunological cells in the treatment of different diseases

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Recall the types and functions of different immune cells |
| CO2 | Employ the mechanism of action of different immune cells and their resultant reaction responses |
| CO3 | Decipher the underlying causes of inherited or autoimmune diseases and  consequences |
| CO4 | Experiment the new technologies involving immune cells in treating  many diseases |
| CO5 | Contribute in understanding the important concepts of recombinant  Vaccine. |

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| **Programme C** | **ode:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper:** Core Paper 10-Biostatistics and Research Methodology | | | | |
| Batch 2023-2024 | | Hours / Week 6 | Total Hours 90 | Credits 4 |

# Sub.Code :23PBC310

***Course Objectives***

* + 1. To learn the different methods of collecting data and processing
    2. To know about the different statistical methods to interpret the collected statistical data
    3. To know the concept of article writing, report writing and thesis making soon

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | State an idea on choosing the appropriate method of collecting data |
| CO2 | Employ the statistical method and process the collected data |
| CO3 | Illustrate the device and standardize the statistical methods |
| CO4 | Discriminate the concept in preparing a report, publishing an article and  writing a project thesis |
| CO5 | Contribute the research knowledge in report writing. |

***Sub.Code: 23PBC311***

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| --- | --- | --- | --- |
| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper** Core Paper11– Advanced Clinical Biochemistry | | | |
| Batch  2023-2024 | Hours / Week  7 | Total Hours  105 | Credits  4 |

# Course Objectives

1. To learn the methodologies for the detection of abnormalities in blood
2. To learn the process of different sample collection and processing
3. To know about the markers in the various metabolic disorders like cancer

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Correlate the important laboratory biochemical tests |
| CO2 | Employ the methods of specimen collection and processing and  analyzing the results |
| CO3 | Investigate the role of enzymes in clinical diagnosis of diseases |
| CO4 | Criticize the diagnostic procedures for tumor development |
| CO5 | Evaluate the role of free radicals in various diseases. |

**Sub.Code : 23PBC3CN**

|  |  |  |  |
| --- | --- | --- | --- |
| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper** Core Practical 3 – Immunology, Genetic Engineering and Clinical Biochemistry | | | |
| Batch 2023-2024 | Hours / Week 5 | Total Hours 75 | Credits 4 |

***Course Objectives***

1. To enhance the students to have practical experience on techniques in immunological tests
2. To learn the methods of estimation of clinical parameters
3. To have hands on experience in genetic engineering

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Recall the basic principles involved in immunology, clinical  biochemistry and genetic engineering |
| CO2 | Demonstrate the techniques involved in immunology, clinical biochemistry and genetic engineering |
| CO3 | Develop and apply the recent technology involved in diagnostic  techniques of immunology, clinical biochemistry and genetic |
| CO4 | Examine and analyze the results involved in immune techniques, clinical biochemistry and genetic engineering |
| CO5 | Be competent in handling the blood and urine samples. |

***Sub.Code :23PBC412***

|  |  |  |  |
| --- | --- | --- | --- |
| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper** Core Paper 12 – Hormonal Biochemistry | | | |
| Batch 2023-2024 | Hours / Week 5 | Total Hours 75 | Credits 4 |

# Course Objectives

* 1. To learn about the system of hormonal functioning in biological systems
  2. To know the regulation and action of different hormones at different conditions
  3. To get an in depth knowledge on diabetes mellitus

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | List the diverse group of hormones and their specific mechanism of action in the bodily metabolism |
| CO2 | Understand the regulatory functions of various hormones and their interrelationship in the endocrine disorders |
| CO3 | Discuss the pathophysiology, diagnosis, treatment and management of  endocrine disorders |
| CO4 | Differentiate the role of hormones in various biological organs |
| CO5 | Evaluate the biological action of different hormones. |

# Sub.Code : 23PBC413

|  |  |  |  |
| --- | --- | --- | --- |
| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper :**Core Paper 13 –Genetic Engineering | | | |
| Batch  2023-2024 | Hours / Week  5 | Total Hours  75 | Credits  4 |

***Course Objectives***

* + 1. To enable the students to learn the principle and application of genetic engineering
    2. To implement and transmission of a genetic material at molecular and cellular levels.

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Enshrine the principles of genetic engineering and the vectors used in  cloning and expression |
| CO2 | Grasp the different cloning strategies and their expression |
| CO3 | Demonstrate about implementation of genetic engineering for different purposes |
| CO4 | Investigate the different strategies of rDNA technology and resolve the  problems encountered |
| CO5 | Analyze the various techniques of gene therapy. |

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| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper** Major Elective: Nanobiotechnology | | | |
| Batch 2023-2024 | Hours / Week 5 | Total Hours 75 | Credits 5 |

***Course Objectives***

1. To get an idea about the application of nanotechnology in biological research
2. To learn the properties and functions of nanomaterials in biological systems
3. To learn the applications of nanomaterials in drug delivery and treatment

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Insight about the nanotechnology concepts |
| CO2 | Explain the methods of Nanoparticle synthesis |
| CO3 | Use properties of nanoparticles |
| CO4 | Apply the knowledge of nanotechnology in biological research |
| CO5 | Employ and apply the knowledge of nanotechnology in waste water treatment, agriculture and diseases. |

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| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper** Major Elective – Microbiology | | | |
| Batch  2023-2024 | Hours / Week  5 | Total Hours  75 | Credits  5 |

***Course Objectives***

1. To learn about the microbiological techniques for microbial studies
2. To learn the energy process taking place in microbes
3. To learn about the food poisoning and pathogenicity of microbes

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Commemorate the general bacteriology and microbial techniques. |
| CO2 | Understand the basic microbial structure and function |
| CO3 | Implement the handling techniques and staining procedures in laboratory |
| CO4 | Resolve the microbial techniques and its applications |
| CO5 | Employ the role of microbes in pathogenicity. |

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| --- | --- | --- | --- |
| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper** Major Elective: Bioinformatics | | | |
| Batch  2023-2024 | Hours / Week  5 | Total Hours  75 | Credits  5 |

***Course Objectives***

1. To learn the role of computer programmes in studying the biological processes
2. To know about the different software’s for data analysis
3. To learn about the methods of data retrieval from various databases

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Learn about the basics and beginning developments in computer usage |
| CO2 | Employ the basics of bioinformatics |
| CO3 | Differentiate various bioinformatics soft wares |
| CO4 | Apply the role bioinformatics in biological science research |
| CO5 | Apply bio informatics in proteomics and human genome project. |

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| **Programme Code:** 07 | | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper** Major Elective - Bioethics, Biosafety and IPR | | | | |
| Batch  2023-2024 | Hours / Week  5 | | Total Hours  75 | Credits  5 |

***Course Objectives***

1. To learn about the demerits of biotechnological applications in recent research
2. To know the ethical issues to be concerned in the course of biological research
3. To know about the intellectual property rights of individual researchers

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Remember the ethical issues of scientific research |
| CO2 | Employ the various regulations in Biosafety and bioethics |
| CO3 | Decipher the awareness of the intellectual property rights |
| CO4 | Experiment the secured and ethical way of research |
| CO5 | Contribute the knowledge in filing the patents. |

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| **Programme Code**: 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper :**Non-Major Elective : Information Security | | |
| Batch 2023-2024 | Hours/Week 4 | Total Hours 60 | Credits 4 |

***Course Objectives***

* 1. Students will identify the core concepts of Information security.
  2. To examine the concepts of Information Security.
  3. To design and implement the security features for IT and Industrial sectors.

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1 | CO1 | To Learn the principles and fundamentals of information security. |
| K2 | CO2 | To Demonstrate the knowledge of Information security concepts |
| K3 | CO3 | To Understand about Information Security Architecture. |
| K4 | CO4 | To Analyze the various streams of security in IT and Industrial sector. |
| K5 | CO5 | To know about Cyber Laws and Regulations. |

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| --- | --- | --- | --- |
| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title:** Non Major Elective – Competitive Science | | |
| Batch 2023-2024 | Hours / Week 5 | Total Hours 75 | Credits 5 |

***Course Objectives***

1. To insist the various facts of life sciences in detail
2. To learn the various information regarding the biological processes
3. To expose the students to the online examination

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Recall all concepts of biochemistry in detail |
| CO2 | Explain the consolidated view of life science subjects |
| CO3 | Develop the analytical capability by learning the objective type questions |
| CO4 | Undertake competitive examinations will necessary preparation |
| CO5 | Apply the knowledge of various fields of biochemistry. |

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| --- | --- | --- | --- |
| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper** Non Major Elective – Bioprocess Technology | | |
| Batch 2023-2024 | Hours / Week 5 | Total Hours 75 | Credits 5 |

***Course Objectives***

* 1. To understand the basics of fermentation techniques
  2. To learn the concepts of screening, optimization and maintenance of cultures
  3. To provide the basics of bioprocess technology

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K4 | CO1 | Remember the basics of bioreactors |
| CO2 | Understanding of the various aspects of bioprocess techniques |
| CO3 | Employ in biotechnological industries |
| CO4 | Distinguish the fermentation process and its kinetics |
| CO5 | Appraise the role of bioreactors in various industries. |

|  |  |  |  |
| --- | --- | --- | --- |
| **Programme code:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper** Non Major Elective – Cancer Biology | | |
| Batch 2023-2024 | Hours / Week 5 | Total Hours 75 | Credits 5 |

***Course Objectives***

1. To know the biology of cancer development
2. To know the features of various cancer types
3. To know about the mechanism of cancer cell cycle
4. To learn the screening and diagnosis methods for cancers
5. To learn the treatment strategies for various cancers

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Remember the basic knowledge on cancer development |
| CO2 | Understand the molecular mechanisms of cancer cell cycle |
| CO3 | Apply the techniques for diagnosis of various cancers |
| CO4 | Contribute the role of different treatment strategies and its application |
| CO5 | Employ various strategies in the treatment of cancer |

# Sub.Code :23PBC3X1

|  |  |  |  |
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| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper :** EDC – Nutritional Biochemistry | | |
| Batch 2023-2024 | Hours / Week 2 | Total Hours 30 | Credits 5 |

***Course Objectives***

* 1. To impart the knowledge on historical overview of nutrition, essential nutrients for metabolism
  2. To provide an overview of the major macro and micronutrients relevant to human health
  3. To discuss the scientific rationale for defining nutritional requirements in healthy individuals and populations, with reference to specific conditions such as pregnancy, lactation, and older age

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1 | CO1 | Assess the nutritional status of community in order to determine the type magnitude and |
|  | distribution of malnutrition |
|  | CO2 | Describe the biochemical and physiological functions of the nutrients and their |
|  | Integrated role. |
|  | CO3 | Evaluate the therapeutic role of key nutrients in maintaining health. |
| K5 | CO4 | Discriminate the diseases caused due to protein deficiency |
|  | CO5 | Employ the role of diet in various diseases. |

# Sub code: 23PBCOD1

|  |  |
| --- | --- |
| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry |
| **Title of the paper** ALC – Forensic Science | |
| Batch 2023-2024 | Credits 2 |

***Course Objectives***

1. To deals with the forensic aspects like legal procedures and types of trauma.
2. To assist and develops regulation in forensic science
3. To give students with a sound basis in forensic science

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Define the basic concepts of forensic science |
| CO2 | Understand the identification procedures employed under forensics  Science |
| CO3 | Apply the fingerprint analysis and interpretations in research fields |
| CO4 | Examine and analyze the results involved in fingerprinting technique |
| CO5 | Evaluate the physical analysis and injuries. |

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| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry |
| **Title of the paper ALC** – Nutraceuticals and Functional Foods | |
| Batch 2023-2024 | Credits 2 |

***Course Objectives***

* 1. To learn the concept of nutraceuticals and functional foods
  2. To know the available biochemical compounds in our system
  3. To prepare functional foods from nutraceutical compounds

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Remember the complete history of nutraceuticals |
| CO2 | Classify the different nutraceuticals |
| CO3 | Illustrate the formulation methods of functional foods |
| CO4 | Distinguish the role of functional foods in disease prevention and management |
| CO5 | Employ the role of nutraceuticals in various disorders. |

# Sub Code: 23PBCOD3

|  |  |  |
| --- | --- | --- |
| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry | |
| **Title of the paper ALC** –Stem Cell Biology | |
| Batch 2023-2024 | | Credits 2 |

***Course Objectives***

1. To learn about the technology of stem cells preparation
2. To learn the properties of stem cells
3. To prepare stem cells for gene therapy

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Recall the different types of stem cells and its applications |
| CO2 | Explain the importance of gene therapy in various diseases |
| CO3 | Interpret implement the stem cell in therapies |
| CO4 | Examine the molecular concepts of stem cell |
| CO5 | Appraise the role of stem cells in various disorders. |

# Sub Code:23PBCOJ1

|  |  |  |  |
| --- | --- | --- | --- |
| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper** JOC –Bio-Entrepreneurship | | |
| Batch  2023-2024 | Hours / Week  2 | Total Hours  30 | Credits  4 |

***Course Objectives***

1. To learn about the concepts of entrepreneurship
2. To study the various opportunities in launching and running a business
3. To know the various strategies of effective entrepreneurship

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | List the concepts of entrepreneurship |
| CO2 | Report the different strategies adopted for a better entrepreneurship |
| CO3 | Discriminate the various biological entrepreneurship programmes |
| CO4 | Apply the quipped enough to become an entrepreneur |
| CO5 | Employ in understanding about the marketing of products. |

# Sub Code: 23PBC0J2

|  |  |  |  |
| --- | --- | --- | --- |
| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper** JOC - Food Safety and Quality Control | | |
| Batch  2023-2024 | Hours / Week  2 | Total Hours  30 | Credits  4 |

***Course Objectives***

* 1. To learn the principles of food quality control
  2. To learn the methodologies to standardize and ensuring food safety
  3. To gain knowledge on the framed food safety regulations

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Repeat the various steps in the quality control of food items |
| CO2 | Classify the various food standards |
| CO3 | Illustrate the various methods to determine the quality of foods |
| CO4 | Examine the various regulations concerned with the food quality issues |
| CO5 | Evaluate the methods in standardization of quality control of foods. |

# Sub Code:23PBCOJ3

|  |  |  |  |
| --- | --- | --- | --- |
| **Programme Code:** 07 | **Programme Title:** M.Sc Biochemistry | | |
| **Title of the paper** JOC –Clinical and Therapeutic Nutrition | | |
| Batch 2023-2024 | Hours / Week 2 | Total Hours 30 | Credits 4 |

***Course Objectives***

1. To enable the basic principles of clinical nutrition
2. To understand the clinical significance of biochemical findings
3. To develop skills in planning and preparation of therapeutic diets for various diseases

***Course Outcomes (CO)***

|  |  |  |
| --- | --- | --- |
| K1  K5 | CO1 | Commemorate the basics of nutritional care |
| CO2 | Explain the relation between nutrition and health |
| CO3 | Interpret the lifestyle and nutritional assessment techniques |
| CO4 | Analyze the main nutrients and its functions in the body |
| CO5 | Appraise the role of probiotics in diet. |