# SYLLABUS

## Bachelor of Business Administration (Hospital Management)

## BBAHM

## UNDER CURRICULUM AND CREDIT FRAMEWORK

## KAZI NAZRUL UNIVERSITYASANSOL, WEST BENGAL

## With effect from 2023-2024 Academic Session

**Syllabus of Bachelor of Business Administration (Hospital Management)**

**BBAHM (1st & 2nd SEMESTER)**

**Syllabus of Bachelor of Business Administration (Hospital Management)**

**BBA (Hospital Management)**

**Semester- I**

| Course Title | CourseType | (L-T-P) | Credit | Marks |
|---|---|---|---|---|
| Hospital Operation Management-I | MAJOR | 4-1-0 | 5 | 100 |
| Principles of Management & Organizational Behaviour | MINOR | 4-1-0 | 5 | 100 |
| E-Commerce | MD | 3-0-0 | 3 | 50 |
| English/ MIL | AEC | 4-0-0 | 4 | 50 |
| Computer Fundamentals, IOT, and AI | SEC | 2-1-0 | 3 | 50 |
| SEMESTER TOTAL | | | 20 | 350 |

## Course Name: Hospital Operation Management-I

**Course Code: BBAHMMJ101**

| Course Type: MAJOR | Course Details: MJC-1 | | | L-T-P: 4-1-0 | |
|---|---|---|---|---|---|
| Credit: 5 | Full Marks: 100 | CA Marks | | ESE Marks | |
| | | Practical | Theoretical | Practical | Theoretical |
| | | 0 | 30 | 0 | 70 |

**Course Objective:** This subject focuses on the basic operational procedures, organizational structure, regular issues, and related strategies to solve problems for a hospital organization in the modern world. Students will learn and embed the skills requires for managing a modern hospital with multiple beds and services.

**Learning Outcome**: After completion of the course learners can

1. Define hospital; relate hospital as an organization in different social structures.

2. Learn hospital organization, hierarchy, and relationship matrix as a complex organization.

3. Understand hospital day-to-day operational issues, managerial issues, and leadership functions in various departments including value addition to the community.

4. Evaluate the hospital organization through internal and external environmental analysis and effective uses of strategies at different levels of the hospital organization.

5. Overall ability to discuss and critically evaluate the mission, vision, and goal statements of any organization.

**Unit 1**. Concept and Definition of Health, Dimensions of health, Concept of Well-being- Quality of health, Spectrum of health, Determinants of Health, Right to health and responsibility for health, Indicators of health- mortality, morbidity, disability, nutritional status, healthcare delivery, utilization rate, social and mental health, environmental, socio-economic, health policy, quality of life indicators; Primary healthcare and declaration of Alma Ata, Health for all.

**Unit 2**. Hospital: Definition, the role of the hospital in healthcare, hospital as a system, as a social system; Types of hospitals; History of hospitals, history of hospitals in India; Hospital and community relationship. Primary, Secondary, Tertiary, and Quaternary healthcare services. Definition of Health and Concept of Health.

**Unit 3**. Hospital as an organization- overview, managerial hierarchy, different organizational structure of hospitals; role of a hospital manager in different managerial levels; Governing body and different hospital committees; Concept and issues in the management of hospitals in India; different organizational issues in hospital; Value chain system.

**Unit 4**. Strategic management- definition, the process of strategic management, Strategic intent- Mission, Vision, Goal, Philosophy; Environmental analysis: SWOT analysis, PESTEL Analysis, Porter's 5 forces model.

**Unit 5**. Level of strategies: Corporate level- Portfolio Analysis, BCG, GE-McKinsey; Strategic Business Units- Generic business strategies, Functional level.
Strategic evaluation- Balance scorecard, Benchmarking.

***Suggested Readings***:

1. Principles of Hospital Administration and Planning- BM Sakharkar, JAYPEE, 2nd Edition.

2. Managing a Modern Hospital- Edited by A.V. Srinivasan, Response SAGE Publication, 2nd Edition.

3. Hospital Administration- DC Joshi and Mamta Joshi, JAYPEE

4. Hospital Management- Text and Cases- K.V. Ramani- PEARSON

5. Strategic Management- An Integrated Approach- Charles W. L. Hill and Gareth R. Jones, CENGAGE Learning, 9th Edition.

6. Strategic Management: The Indian Context- R. Srinivasan, Prentice Hall India Learning Private Limited.

**Teaching-Learning Process**:

The teaching-learning process may be interactive classroom sessions with the help of PowerPoint presentations, reflective assessments, and case study discussions to ensure active participation and continuous learning.

**Assessment Methods**:

Internal Examinations (30 marks): Internal assessment may be conducted by using any one or in combinations of Class participation, Presentation, Project writing, Case studies, Assignments, and Surprise tests as suitable.

External Examination (70 Marks): End Semester Written Examination, duration 4 hours.

# Course Name: Principles of Management & Organizational Behaviour

## Course Code: BBAHMMN101

| Course Type: MINOR | Course Details: MNC-1 | | | L-T-P: 4-1-0 | |
|---|---|---|---|---|---|
| Credit: 6 | Full Marks: 100 | CA Marks | | ESE Marks | |
| | | Practical | Theoretical | Practical | Theoretical |
| | | 0 | 30 | 0 | 70 |

**Course Objective:** The objective of the "Principles of Management & Organizational Behaviour" course is to provide students with a foundational understanding of management principles and the dynamics of organizational behavior. The course aims to equip students with essential knowledge, skills, and insights to effectively manage people, resources, and processes in various organizational settings.

**Learning Outcome**: After completing the course, the student shall be able to:

1. Understand the evolution of management and apprehend its effect on future managers.
2. Analyze how organizations adapt to an uncertain environment and decipher decision-making techniques managers use to influence and control the internal environment.
3. Comprehend the changes happening in organization structure over time.
4. Analyze the relationship amongst functions of management i.e. planning, organizing,directing, and controlling.
5. Appreciate the changing dynamics of management practice.
6. Develop an understanding of different approaches to designing organizational structures.
7. Understand the role of personality, learning, and emotions at work.
8. Discover and understand the concept of motivation, leadership, power, and conflict.
9. Understand the foundations of group behavior and the framework for organizational changeand development.

**Unit 1**: Nature, Scope and Process of Management: Concept of Management, Role and Importance of Management, Functions and Levels of Management, Management – A Science and an Art; Evolution of Management Thought: Early Contributors to Management Thoughts; Scientific Management, Administrative Theory of Management.

**Unit 2**: Planning and Organizing: Features of Planning, Importance, Steps, Types. Decision-making; Formal and Informal Organizations, Organization Structure: Line and staff, Delegation of Authority, Centralization and decentralization, Departmentalization: Concept and Types, Span of Management.

**Unit 3**: Leadership, Coordination and Control: Leadership, Functions and Importance, Qualities of a Good Leader, Leadership Styles. Concept and features of Coordination, Nature of Control, Relationship between Planning and Control, Elements of control system.

**Unit 4**: Introduction to Organisational Behaviour: Concept, Learning objectives, Challenges and Opportunities of Organisational Behaviour (OB), Issues in Developing an OB Model; Characteristics of Human Behaviour.

**Unit 5**: Personality, Perception, Motivation & Group Dynamics: Personality: Concept and Types, Major determinants. MBTI, Type-A and Type- B Theory; Perception: Concept, Factors influencing Perception; Learning: Concept; Attitude: Concept, Different Job Attitudes; Motivation: Concept, Basic Theories of Motivation (Maslow, Herzberg, McClelland and McGregor); Group Dynamics: Concept of group, Stages of Group Development, Types of Groups, Work Teams Vs. Work Groups, Group Synergy.

*Suggested Readings*:

1. Management: Theory and Practice- C.B. Gupta, Sultan Chand and Sons Educational Publishers.
2. Principles and Practice of Management- Dr. L.M. Prasad, Sultan Chand and Sons Educational Publishers, 6th Edition.
3. Principles of Hospital Administration and Planning- BM Sakharkar, JAYPEE, 2nd Edition.
4. Management Case Studies: A student's Handbook- R.K. Yaraddi, Dr. R. R Kulkarni, Dr. S.R.Patil, R.R Navalagi, Notion Press, 1st Edition.
5. Essentials of Management: Weihrich and Koontz, et al, Tata McGraw Hill.
6. Management: Stoner J and Freeman RE, Prentice-Hall.
7. Management: Daft, RL, Thomson.
8. Organizational Behaviour- Stephen P. Robbins, Timothy A. Judge, Neharika Vohra, Pearson, 18th Edition
9. Managing Organizational Behaviour- Dr. V.S.P Rao, V. Sudeepa, Laxmi Publication Pvt Ltd, 3rd Edition.
10. Management of Organizational behavior – Harsey, Paul & Kenneth H. Blancher; PHI.
11. Organizational Behaviour: Human Behaviour at Work - Davis and Newstrom, Tata McGraw-Hill.

**Teaching-Learning Process**:

The teaching-learning process may be interactive classroom sessions with the help of PowerPoint presentations, reflective assessments, and case study discussions to ensure active participation and continuous learning.

**Assessment Methods**:

Internal Examinations (30 marks): Internal assessment may be conducted by using any one or in combinations of Class participation, Presentation, Project writing, Case studies, Assignments, and Surprise tests as suitable.

External Examination (70 Marks): End Semester Written Examination, duration 4 hours.

## Course Name: E-Commerce

**Course Code:**

| Course Type: Multi-Dimensional | Course Details: MDC-1 | | | L-T-P: 3-0-0 | |
|---|---|---|---|---|---|
| Credit: 3 | Full Marks: 50 | CA Marks | | ESE Marks | |
| | | Practical | Theoretical | Practical | Theoretical |
| | | 0 | 15 | 0 | 35 |

**Course Objectives**

The purpose of this course is provide an introduction to e-commerce for business and management. It will also help to understand the complexity of e-commerce and its many facets. Students will learn how e- business and e-commerce fit together. Also they will be able to identify the impact of e-commerce and recognise the benefits and limitations of e-commerce.

**Learning Outcomes**

After completing the course, the student shall be able to:

1. Identify the component parts of e-commerce.
2. Identify the benefits of selling online.
3. Know how to optimise and stay safe when selling online.
4. Understand the risks around Cyber Security when trading and doing business online.
5. Understand the basic concepts and technologies used in the field of management information systems.
6. Understand the processes of developing and implementing information systems.

7. Be aware of the ethical, social, and security issues of information systems.

**Unit-I: Introduction:** E-Commerce-meaning, nature, concepts, types; e-commerce business models B2B [concept, major activities, types of B to B market (independent, buyer oriented, supplier oriented, e-market place)], B2C [portals, e-tailer, content provider, transaction broker, real life examples of B2C], C2C, C2B, etc.; forces behind e- commerce, e-Governance [meaning, types, significance, real life examples].

**Unit-II: E-CRM and SCM:** E-CRM-definition, features, goals of E-CRM business framework, phases of E-CRM, types of E-CRM, Functional components of E-CRM, strategies for E-CRM solutions; SCM-definition, features, types of supply chain.

**Unit-III: Digital Payment:** Methods of e-payments [Debit Card, Credit Card, Smart Cards, e-Money], electronic or digital wallet, digital signature (procedures, working and legal provisions), payment gateways [Core Banking Solution or CBS, Mobile Payment, UPI, NCPI, International Payments], Online banking [meaning, concepts, importance, electronic fund transfer, automated clearing house, automated ledger posting], risks involved in e- payments.

**Unit-IV: ERP:** Definition, features, major characteristics, levels of ERP, benefits of ERP, enterprise potential of ERP, modules of ERP, phases of ERP implementation, limitations of ERP.

**Unit-V: New Trends in E-Commerce:** Social Commerce-concept, definition, features; Digital Marketing- definition, objectives, methods, limitations; Advertisement in Social Media-objectives, advantages and disadvantages, procedures.

*Suggested Readings*:


1. P. T. Joseph, E-Commerce: An Indian Perspective, PHI Learning
2. Henry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang, E Commerce: Fundamentals and Applications, Wiley.
3. Laudon, E-Commerce, Pearson Education India
4. Schneider G., E-Business, Cengage
5. Bhaskar, B., E–Commerce, McGraw Hill

**Teaching Learning Process**

Teaching learning process may be interactive classroom sessions. It includes theoretical discussion and numerical problems solving.

**Assessment Methods**

Internal Examination (15 Marks): Internal Assessment may be conducted by using any one or in combinations of Class participation, Presentation, Project Writing and Presentation, Assignment and Presentation, Surprise Test as suitable.

External Examination (35 Marks): End Semester Written Examination, Duration 4 Hours

## Course Name: English/ MIL Communication

**Course Code:**

| Course Type: Ability Enhancement Compulsory Course | Course Details: AEC-1 | | | L-T-P: 4-0-0 | |
|---|---|---|---|---|---|
| Credit: 4 | Full Marks: 50 | CA Marks | | ESE Marks | |
| | | Practical | Theoretical | Practical | Theoretical |
| | | 0 | 15 | 0 | 35 |

## Course Name: Computer Fundamentals, IoT, and AI

**Course Code: BBAHMSE101**

| Course Type: Skill Enhancement Course | Course Details: SEC-1 | | | L-T-P: 2-1-0 | |
|---|---|---|---|---|---|
| Credit: 3 | Full Marks: 50 | CA Marks | | ESE Marks | |
| | | Practical | Theoretical | Practical | Theoretical |
| | | 0 | 15 | 0 | 35 |

**Course Objective**:

Computer fundamentals are an essential part of learning, everyone should know to operate computers. It gives students an in-depth understanding of the use of computers in business, society, and education. The introduction of computing devices, reinforcement of computer vocabulary, computer hardware and software, the internet, networking, and mobile computing. Provides hands-on training on Microsoft Office applications- mainly on Word, Excel, and PowerPoint, and enhancement of advanced skills. The effect of technology (AI) on society and its operations is varied. Healthcare workers that are knowledgeable about AI are needed to enable interactive and illustrative AI and assure the caliber of AI-based systems to boost patient safety. For those involved in decision-making, purchasing, and implementing AI-based systems, knowledge of AI is also crucial. The course gives an introduction to artificial intelligence (AI) and its use in the healthcare industry.

**Learning Outcomes**

1. Describe the usage of computers and why computers are essential components in business and society, utilize the Internet Web resources and evaluate online e-business systems.
2. Solve common business problems using appropriate Information Technology applications and systems.
3. Identify categories of programs, system software, and applications. Organize and work with files and folders, describe various types of networks network standards, and communication software.
4. Internet of Things (IoT) applications in day-to-day activities, Medical IoT applications.
5. An idea on IoT uses in hospital operations, patient satisfaction, and continuous monitoring for diagnosis, treatment, and effective utilization of resources.
6. Describe several AI techniques, including their advantages and disadvantages, for the creation of AI applications in healthcare, and compare and choose the most appropriate AI techniques.
7. Reason about legal conditions and ethical challenges in AI, think about the challenges and motivating elements for using AI-based solutions in the healthcare industry.

**Unit 1**. **Introduction to Computer:** Computer Characteristics, Concept of Hardware, Software, Evolution of Computer and Generations, Types of Computer – Analog and Digital Computers, Hybrid Computers, General Purpose, and Special Purpose Computer, Limitations of Computer Applications of Computer in Various Fields.

**Structure and Working of Computer:** Functional Block Diagram of Computer. CPU, ALU, Memory Unit, Bus Structure of Digital Computer – Address, Data, and Control Bus.

**Input/Output Devices:** Input Device – Keyboard, Mouse, Scanner, MICR, OMR. Output Devices – VDU, Printers-Dot Matrix, Daisy-wheel, Inkjet, Laser, Line Printers, and Plotters.

**Unit 2. Computer Memory:** Memory Concept, Memory Cell, Memory Organisation, Semiconductor Memory – RAM, ROM, PROM, EPROM, Secondary Storage Devices – Magnetic Tape, Magnetic Disk (Floppy Disk and Hard Disk.), Compact Disk.
**Computer Language and Software:** Algorithm, Flowcharts, Machine Language, Assembly Language, High-Level Language, Assembler, Compiler, Interpreter. Characteristics of Good Language. Software – System and Application Software.
**Operating System:** Operating System, Evolution of Operating System. Functions of Operating System. Types of Operating Systems. Detailed Study of Windows Operating System. Introduction and Features of LINUX OS.

**Unit 3. Introduction to IoT:** IOT concepts, IoT Standards, Components of IoT, Relevance of IoT for the future, IoT Applications in Health care system, Challenges in IoT implementation.
**Cloud Platforms for IoT**: Virtualization concepts and Cloud Architecture, Cloud computing, benefits, Cloud services — SaaS, PaaS, IaaS, Cloud providers & offerings, Study of IoT Cloud platforms.

**Unit 4. Introduction to AI:** Definition, Advantages of AI, Application areas of AI, Brief history of AI, Supervised, Un-supervised, and Semi-supervised learning, Introduction to pandas, Data visualization with pandas, Neural network, ANN, Applications of ANN, Deep learning, Pattern recognition, Interactive process mining.
Use of ChatGPT, Google Bard, Grammarly, QuillBot, Slide-making AI, AI for documents, Canva, Chat Bot, etc.

**Unit 5. IoT &AI in Healthcare:** Use of IoT in the healthcare field, the introduction of WSN, RFID, Ambient Assisted Living (AAM), Adverse Drug Reaction (ADR), Embedded Context Prediction (ECP), Wearable Device Access (WDA), Sematic Medical Access (SMA), Smart Dust in brief in the healthcare context.
AI for medical image analysis and imaging, AI for data analysis and data mining, Future applications and techniques, and Ethical and data protection issues in AI-based solutions.
**Project:** Breast cancer detection project, Diagnosing Coronary Artery Disease Project.

**Unit 6**. Microsoft Office: Document, Excel, PowerPoint- principles, and practices for the professional world; AI tools integrated with Microsoft-Office- popular Practices.

*Suggested Readings*


1. **Healthcare and Artificial Intelligence**, Published by: Cédric Villani, Bernard Nordlinger, and Daniela Rus, 2020, ISBN: 3030321606, Springer.
2. **Artificial Intelligence in Healthcare;** edited by Adam Bohr & KavehMemarzadeh, Published by Academic Press, 2020, ISBN: 0128184388.

3. **Artificial Intelligence in Healthcare;** authored & published by: Parag Suresh Mahajan, 2nd Edition, 2019, ISBN: 9353115574.
4. Machine Learning and the Internet of Medical Things in Healthcare, edited by Krishna Kant Singh, Mohamed Elhoseni, AkanshaSinga, Ahmed A. Elngar, 2021, Published by Academic Press, ISBN- 978-0-12-821229-5, https://doi.org/10.1016/C2019-0-03077-4
5. Deep Learning and IoT in Healthcare Systems: Paradigms and Applications edited by Krishna Kant Singh, Akansha Singh, Jenn-Wei Lin, Ahmed A. Elngar, 1st Edition, 2021, Published by Apple Academic Press (Taylor & Francis), ebook ISBN: 9781003055082https://doi.org/10.1201/9781003055082
6. A Guide to Artificial Intelligence in Healthcare by Dr. BertalanMeskó, 2019, The Medical Futurist.
7. Internet of Things and its Applications by Prof. Satish Jain & Shashi Singh, 2020, BPB Publications.
8. Fundamentals of Computers by Er. Meera Goyal & Sushil Kumar Maurya, 2021, SBPD Publishers.
9. Fundamental of Computers by Prof. Sarita Dhawale&Thankur Akash Ashok, ISBN: 978-81-932613-1-6, Thakur Publications Pvt. Ltd., Pune.
10. Advance Excel 2019 Training Guide: Tips and Tricks To Quick Start Your Excel Skills by Manish Nigam, 2019, BPB Publishers.
11. Microsoft Office 2019 for Dummies by Wallace Wang, 2018, Wiley.
12. BPB's Computer Course Windows 10 with MS Office 2016 by Prof. Satish Jain, 2018, BPB Publishers.

**TeachingLearningProcess**

The teaching-learning process may be interactive classroom sessions with the help of PowerPoint presentations, reflective assessments, and case study discussions to ensure active participation and continuous learning.

**AssessmentMethods**

Internal Examination (15 Marks): Internal Assessment may be conducted by using any one orincombinationsofClassparticipation, Presentation, ProjectWriting, Presentation, Assignment, Presentation, or Surprise Test as suitable.

ExternalExamination (35Marks): End Semester Written Examination, Duration: 2 Hours.

**Syllabus of Bachelor of Business Administration (Hospital Management)**

**BBA (Hospital Management)**

**Semester- II**

| Course Title | CourseType | (L-T-P) | Credit | Marks |
|---|---|---|---|---|
| Medical Terminology | MAJOR | 4-1-0 | 5 | 100 |
| Bio-Statistics | MINOR | 4-1-0 | 5 | 100 |
| Nutrition and Public Health | MD | 3-0-0 | 3 | 50 |
| Environment Studies | VAC | 4-0-0 | 4 | 50 |
| Diagnostic Techniques in Healthcare | SEC | 2-1-0 | 3 | 50 |
| SEMESTER TOTAL | | | 20 | 350 |

## Course Name: Medical Terminology

**Course Code: BBAHMMJ201**

| Course Type: MAJOR | Course Details: MJC-2 | | | L-T-P: 4-1-0 | |
|---|---|---|---|---|---|
| Credit: 5 | Full Marks: 100 | CA Marks | | ESE Marks | |
| | | Practical | Theoretical | Practical | Theoretical |
| | | 0 | 30 | 0 | 70 |

**Course Objective:** The course consists of all types of medical terminology, prefix, suffix, and root of terms related to anatomy, physiology, and diseases of the human body. This subject

focuses on elementary anatomy and physiology of the human body, main systems, symptomatic and diagnostic terms, operative terms, abbreviations, and common diseases.

**Learning Outcome**: After completion of the course learners can

1. Memorize medical terms, define diseases and symptoms, read and describe the prescription.

2. Learn human anatomy and physiology from the organ and system level.

3. Understand diseases, symptoms, abbreviations, and prescription terminology related to each system and specialization.

4. Evaluate hospital equipment procurements, works, and maintenance.

5. Categories different diagnostic equipment, its works, quality, and energy efficiency.

**Unit 1.** Medical Terminology- Definition, basic word structure- roots, prefix, suffix; Source of medical words; basic prefixes, suffixes, and roots; terminology related to colours, location, numbers, amount, positions; common abbreviations used in prescription.

**Unit 2**. Cell, the structure of the cell, cell division; Overview of Human Anatomy and Body Systems; Tissues, Organs, Anatomical Terminology, and directional terms; Introduction to Body Planes and Cavities.

**Unit 3**. Musculoskeletal System: Overview, Structure, and Functions of Bone & Joints, Structure and Function of Muscles; Structure & Functions of Integumentary System- Skin, hair, and nails; Cardiovascular System- Heart, Blood, and Lymphatic Systems; Nervous System- central and peripheral; Digestive System; Endocrine System; Respiratory System; Sense Organs; Excretory System; Reproductive System- male and female.

**Unit 4**. Common diseases and operative terms related to human body systems: Musculoskeletal system, Integumentary system, Cardiovascular system, Blood and Lymphatic system, Nervous system, basic terms related to Psychiatry, Digestive system, Endocrine system, Respiratory system, Sensory system, Excretory system, Reproductive system, basic terms related to Oncology.

**Unit 5**. Pharmacology- Definition, Drugs- definition, chemical, generic, and brand name; Classification of drugs with examples.

**Unit 6**. Medical Transcription overview, understanding the importance of accuracy, confidentiality, and professionalism in transcription; formatting and proofreading skills and techniques; overview of documentation standards as per HIPAA and NABH; transcription equipment and software.

*Suggested Readings*:

1. Paramedics 6-in-1 Handbook by GD Mogli, 2nd Edition, Jaypee Brothers Medical Publishers (p) Ltd.
2. Human Physiology, Volume 1 and 2 by Dr. C. C. Chatterjee
3. Medical Terminology Workbook by M. Mastenbjork and S. Meloni, Medical Creations.
4. Textbook of Physiology by P. Sathya and Viji Devanand, by CBS Publishers & Distributors Pvt. Ltd.
5. Handbook of General Anatomy by BD Chaurasia, 5th Edition, CBS Publishers &Distributord Pvt. Ltd.
6. Textbook of Anatomy and Physiology for Nurses by PR Ashalatha and G. Deepa, 5th Edition, JAYPEE.
7. Medical Terminology Simplified by Barbara A. Gylys and Regina M. Masters, E.A. Davis Company, Philadelphia.
8. Medical Terminology Express by Barbara A. Gylys, Regina M. Masters, E.A. Davis Company, Philadelphia.

**Teaching-Learning Process**:

The teaching-learning process may be interactive classroom sessions with the help of PowerPoint presentations, reflective assessments, audio-visuals, and case discussions to ensure active participation and continuous learning.

**Assessment Methods**:

Internal Examinations (30 marks): Internal assessment may be conducted by using any one or in combinations of Class participation, Presentation, Project writing, Assignments, and Surprise tests as suitable.
External Examination (70 Marks): End Semester Written Examination, duration 4 hours.

# Course Name: Bio-Statistics

## Course Code: BBAHMMN201

| Course Type: Minor | Course Details: MNC-2 | | | L-T-P: 4-1-0 | |
|---|---|---|---|---|---|
| Credit: 5 | Full Marks: 100 | CA Marks | | ESE Marks | |
| | | Practical | Theoretical | Practical | Theoretical |
| | | 0 | **30** | 0 | **70** |

**Course Objective:** The objective of the "Bio-Statistics" course is to equip students with the foundational knowledge and analytical skills needed to effectively apply statistical methods to biological and medical data. The course aims to provide students with a solid understanding of statistical concepts, techniques, and their relevance in designing experiments, analyzing data, and drawing meaningful conclusions in the fields of biology, medicine, and related disciplines.

**Learning Outcome**: By the end of this course, students should be able to:

1. Understand Statistical Concepts: Demonstrate a clear understanding of fundamental statistical concepts, including variables, data types, measures of central tendency, and variability.

2. Select Appropriate Statistical Methods: Identify and select appropriate statistical methods for analyzing different types of biological and medical data, considering factors such as data distribution and research objectives.

3. Design Experiments: Design experiments and studies with appropriate sampling techniques, sample size determination, and randomization to ensure valid and reliable results.

4. Interpret Results: Interpret statistical results in the context of biological and medical research questions, drawing valid conclusions and avoiding misinterpretations.

5. Handle Missing Data and Outliers: Address issues related to missing data and outliers, selecting appropriate techniques for imputation and outlier detection.

6. Communicate Results: Communicate statistical findings effectively through written reports, graphical representations, and presentations, targeting both technical and non-technical audiences.

7. Collaborate in Research Teams: Collaborate effectively within research teams, contributing statistical expertise to interdisciplinary projects and promoting effective data-driven decision-making.

**Unit 1.** Definition of Statistics and Bio-Statistics, importance and scope of statistics, limitations of Statistics; Types of data, important sources of secondary data; Collection and presentation of Data: different methods of collecting primary data: Tabular and graphical methods of data presentation; Frequency distribution; Diagrammatic presentation of frequency data: Line chart, Bar chart, Pie diagram, Histogram, Frequency polygon, Ogive.

**Unit 2**. Measures of Central Tendency**:** Simple and Weighted Arithmetic Mean – Properties, Merits, and Demerits; Geometric Mean and Harmonic Mean, Relationship among A.M., G.M., and H.M; Median and Mode – Measures, Properties, Merits, and Demerits.

**Unit 3**. Measures of Dispersion: Range, Standard Deviation, Mean Absolute Deviation, Quartile Deviation – their Properties, Merits, and Demerits; Relative Measures.
Concepts of Skewness and Kurtosis, Different Measures of Skewness and Kurtosis.

**Unit 4**. Concept of Correlation and Regression; Scatter Diagram; Pearson's Correlation Coefficient and its Properties; Spearman's Rank Correlation ( in case of without tie); Simple Regression and its properties.
Vital Statistics: Measurement of Mortality, Measurement of Fertility, and Measurement of Population Growth.

**Unit 5**. Theory of Probability and Distributions: Concept and Important definition; Classical, Additive, Multiplicative and Conditional Theorem of Probability; student's t-test (including paired t-test), Goodness of fit and independence of attributes through Chi-square test.

***Suggested Readings***:


1. Statistical Methods by N.G Das (Vol I and II), McGraw Hill Education (India) Pvt. Ltd.
2. Mahajan's Methods in Biostatistics by Bratati Banerjee, 9th Edition, Jaypee Brothers.
3. Principles of Biostatistics by Marcello Pagano, Kimberlee Gauvreau, 2nd Edition, CRC Press.
4. Elements of Health Statistics by N.S.N Rao, Tara Publications.
5. A First Course in Probability by Sheldon Ross, 10th Edition, 2022, Pearson.

6. Fundamental of Statistics (vol. 1 and 2): Goon, Gupta and Dasgupta, World Press.
7. Fundamentals of Mathematical Statistics by S.C Gupta, V.K. Kapoor, 12th Edition, 2020, Sultan Chand and Sons.

**Teaching-Learning Process**:

The teaching-learning process may be interactive classroom sessions with the help of PowerPoint presentations, reflective assessments, and case study discussions to ensure active participation and continuous learning.

**Assessment Methods**:

Internal Examinations (30 marks): Internal assessment may be conducted by using any one or in combinations of Class participation, Presentation, Project writing, Case studies, Assignments, and Surprise tests as suitable.

External Examination (70 Marks): End Semester Written Examination, duration 4 hours.

## Course Name: Nutrition and Public Health

**Course Code:**

| Course Type: Multi-Dimensional | Course Details: MDC-2 | | | L-T-P: 3-0-0 | |
|---|---|---|---|---|---|
| Credit: 3 | Full Marks: 50 | CA Marks | | ESE Marks | |
| | | Practical | Theoretical | Practical | Theoretical |
| | | 0 | 15 | 0 | 35 |

## Course Name: Environment Studies

**Course Code: VAC201**

| Course Type: ValueAdded Courses | Course Details: VAC-1 | | | L-T-P: 4-0-0 | |
|---|---|---|---|---|---|
| Credit: 4 | Full Marks: 50 | CA Marks | | ESE Marks | |
| | | Practical | Theoretical | Practical | Theoretical |
| | | 0 | 15 | 0 | 35 |

## Course Name: Diagnostic Techniques in Healthcare

**Course Code: BBAHMSE201**

| Course Type: Skill Enhancement Course | Course Details: SEC-1 | | | L-T-P: 2-1-0 | |
|---|---|---|---|---|---|
| Credit: 3 | Full Marks: 50 | CA Marks | | ESE Marks | |
| | | Practical | Theoretical | Practical | Theoretical |
| | | 0 | 15 | 0 | 35 |

**Course Objective**: The Diagnosis Techniques in Healthcare course provides a comprehensive understanding of various diagnostic techniques used in healthcare settings. It covers a wide range of diagnostic methods, including physical examination, laboratory tests, imaging, and specialized diagnostic procedures. This course aims to equip students with the knowledge and skills necessary to interpret diagnostic results, understand their clinical significance, and contribute to effective patient care and treatment planning.

**Learning Outcome**:
By the end of the Diagnosis Techniques in Healthcare course, students should be able to:

1. Understand the importance of accurate diagnosis in healthcare and the role of diagnostic techniques in patient care.
2. Demonstrate knowledge of various diagnostic methods, including history taking, physical examination, laboratory tests, imaging techniques, and specialized diagnostic procedures.
3. Apply appropriate techniques for gathering patient history and conducting a comprehensive physical examination.
4. Interpret laboratory diagnostic tests, including hematological, clinical chemistry, and microbiological tests.
5. Evaluate imaging techniques for diagnostic purposes.
6. Understand the principles and applications of genetic and molecular diagnostic techniques in disease diagnosis.
7. Interpret diagnostic results in specialty areas.
8. Understand the role of biopsies, pathology, and histology in the diagnostic process.
9. Stay updated with emerging diagnostic technologies and future trends in healthcare.
10. Apply critical thinking skills to assess diagnostic information and contribute to effective patient care and treatment planning.
11. Communicate and collaborate effectively with healthcare professionals, patients, and their families regarding diagnostic procedures and results.

**Unit 1**. Introduction to diagnostic techniques- the importance of accurate diagnostic techniques in healthcare, history of diagnostic techniques and tools in brief; patient history and documentation- components of a comprehensive physical examination- communication with the patient, confidentiality.

**Unit 2**. Blood test and hematology- Hemoglobin, Complete blood count (CBC), Blood typing and cross-matching, haemostasis and coagulation test; Clinical chemistry- Liver and Kidney function tests, cardiac enzymes, markers & lipid profile test. Endocrine function tests- Thyroid, Adrenal, and Diabetes related tests; Immunoglobulin and antibody tests- autoimmune disease markers, serological test for infectious disease.

**Unit 3**. Microbial cultural and sensitivity testing, molecular diagnosis (PCR, DNA sequencing), Identification of common pathogens; Urine test- physical, chemical, microscopic; Analysis of cerebrospinal fluid, pleural fluid, and ascetic fluid; Tumor markers for common type of cancers; Pregnancy related tests.

**Unit 4**. Common equipment and diagnostic techniques: X-Ray, CT, and PET (All type) Scan, MRI, ECG, EEG, USG, Infusion and Syringe pump, Anaesthesia machine/ Boyle's apparatus, Heart-lung machine, IABP, ABG analysis machine, USG Doppler, Echocardiography, PFT, Ventilator, Diathermy, Patient Monitor, Defibrillators, Hematology analyzer/ Cell counter, Biochemistry analyzer, ESU/ Cautery machine, Suction apparatus.

**Unit 5**. Sterilizer- Autoclave, ETO, Plasma; Bone densitometer, C-Arm machine, Cath lab, Pacemaker, Endoscopy, Colonoscopy, Arthroscopy, Bronchoscopy, IVF, Lithotripsy, Lung Function test, FNAC, FNAB, Gastroscope, Operating Instrument set, Oxygen concentrator, Pulsoxymeter, Robotic surgery.

*Suggestive Readings*:


1. Paramedics 6-in-1 Handbook by GD Mogli, 2nd Edition, Jaypee Brothers Medical Publishers (p) Ltd.
2. https://cdsco.gov.in/opencms/opencms/en/Medical-Device-Diagnostics/Medical-Device-Diagnostics/
3. Biomedical Equipment Management & Maintenance Program by National Health Mission, https://nhm.gov.in/index1.php?lang=1&level=3&sublinkid=1224&lid=586
4. Laboratory Equipments: Hospital Medical Equipments made Easy by R.K.V Murugan, 1st Edition, 2022, Notion Press.
5. Introduction to Biomedical Instrumentation and Its Applications by Sudip Paul et. Al., 2022, Academic Press.
6. Sonography Principles and Instruments by Frederick W. Kremkau, 10th Edition, 2020, Saunders.
7. Pocket Essential Medical Equipment by David Zhang and Norbert Banhidy, 1st Edition, 2022, CRC Press.


**Teaching-Learning Process**:

The teaching-learning process may be interactive classroom sessions with the help of PowerPoint presentations, reflective assessments, and case study discussions to ensure active participation and continuous learning.

**Assessment Methods**:

Internal Examinations (15 marks): Internal assessment may be conducted by using any one or in combinations of Class participation, Presentation, Project writing, Case studies, Assignments, and Surprise tests as suitable.

External Examination (35 Marks): End Semester Written Examination, duration 2 hours.