



MGM INSTITUTE OF HEALTH SCIENCES

(Deemed to be University u/s 3 of UGC Act, 1956)

Grade 'A++' Accredited by NAAC

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CHOICE BASED CREDIT SYSTEM (CBCS)

(with effect from 2023-2024 Batches)

Curriculum for M.Sc. Health Informatics

Approved as per AC-46/2023, Dated 28/04/2023

Amended History

1. Approved as per AC-46/2023 Resolution No. 6.25, Dated 28/04/2023



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MGM NEW BOMBAY COLLEGE OF NURSING

5th Floor, MGM Educational Campus, Plot No. 1 & 2, Sector-1
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M.Sc. Health Informatics



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INTRODUCTION:

Information is the life of health care delivery system. The medical record, in manual or automated form, houses the medical information that describes all aspects of patient care. Physicians, nurses, and other health care providers require medical information for treating a patient. The medical record serves as a communication link among care-givers. Documentation in the medical record also serves to protect the legal interests of the patient, health care provider, and health care facility.

AIM:

The aim of the recommended curriculum is to produce Health Informatics (HIM) professionals who are knowledgeable with the:

- Definition and characteristics of 'Good' Medical Record
- Values of 'Good' Medical Record to various users
- Required Characteristics of entries in medical Records
- Responsibility for Medical Record Quality

They will be able to manage:

- Source-oriented, Problem-oriented, and Integrated Health Information Management
- Medical Record Forms and their Content
- Standard Order of Arrangement of Medical Record forms
- Analysis of Medical Record-Quantitative & Qualitative and Incomplete Record Control

All aspects of Health Information Management have been considered in the development of this curriculum together with the identification of the roles expected for different levels of Health Informatics professionals based on their qualification and experience.

Health information management is a combination of business, science, and information technology. These professionals are managers: experts in processing, analyzing and reporting information vital to the health care industry, respected staff members who interact daily with the clinical and administrative staff, all of whom depend on health information to perform their jobs.

A blend of business and computer expertise, health information management links health care clinicians with information technology and is the bridge between patients' health information and health insurers, state and central government, and other regulating agencies.



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HIM professionals do not just work in hospitals. They work for accounting firms, insurance companies, information systems vendors, government agencies, pharmaceutical research companies, and others. Wide varieties of employers actively recruit health information managers. According to the department of labor, employment opportunities for Health Information Management (HIM) professionals continue to grow much faster than the average for all occupations. They may look for career choices not only in acute-care settings, but in all types of alternative care settings, as well as in education, business, and legal settings. Services provided in these areas range from technical to administrative, with emphasis being placed on the latter. As a vital member of the health care team, the health information manager is responsible for managing health information systems. This professional plan and develops health information systems that meet standards of accrediting and regulatory agencies. They also design health information systems appropriate for various sizes and types of health care facilities. A postgraduate serve as an advocate for privacy and confidentiality of health information and plans and offers in-service educational programs for health care personnel. There are multiple job opportunities available to HIM graduates. The following is just a sample of jobs in various practice settings:

Traditional Settings	
Management, HIM (Medical Records)	Responsible for the day-to-day operations of an HIM Department, maintains a budget, oversees staff, and interacts with other hospital departments, plans for the department.
Tumor registry	Reviews, abstracts, and codes clinical cancer information in order to comply with government regulations. Maintains a database. Also
Coding	Reviews medical documentation and assigns appropriate diagnosis
Trauma registry (E.R.)	Collects, codes, and maintains data unique to trauma registry, maintains a database. Assists with research projects, performance improvement, and administrative planning.
Transcription	Responsible for providing accurate and timely reports for patient care, documentation and billing.
Quality Improvement	Collect and summarize performance data, identify opportunities for improvement, and present data to other clinicians and administrative staff.
Release of Information	Track, process, and evaluate requests for release of medical information. Requires knowledge of central and state laws & regulations.



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Patient Admissions	Responsible for patient admission, insurance verification, database maintenance. Oversees a staff, maintains a budget, and communicates with other hospital departments.
Compliance Auditor	Responsible for conducting chart audits, preparing reports, and reporting data. Also, develops policies and procedures for staff training.
Physician Accreditation	Maintains databases with physician information in order to provide data to administrative staff for physician accreditation.
Utilization Review	Works closely with clinicians to analyze patient records in order to determine admission criteria and use of resources for length of stay. Must be knowledgeable of insurance requirements.
Physician offices	Manages day-to-day operations of a physician office, including scheduling, billing, staffing, budgeting, and record keeping, and reporting.
Risk Management	Collects, evaluates, and maintains data concerning patient injuries, claims, worker's compensation, etc. Reports data to administrative staff and makes changes to policies and procedures as needed.

Non-Traditional Settings	
Consulting firms	Works with various clients to provide HIM expertise.
Government agencies	Possible job opportunities involve working with state and central government agencies.
Law firms	Provide HIM expertise to areas within health law, central and state regulations concerning health care.
Insurance companies	Work with various providers in order to negotiate contracts, assist clients with claims.
Correctional facilities	Maintain health records, perform quality reviews and assist in research studies.
Extended care facilities	Maintain health records to provide a continuum of care, comply with central and state regulations, conduct quality reviews, and maintain accreditation requirements.
Pharmaceutical Research Statistician, Clinical Trials Coordinator, Data Manager	Provides data management services in order to meet customer needs. Manages projects, staff, and timelines.
Information Technology System Analyst Project Manager Data Manager	Works with software vendors to design clinical software, provides training to end-user staff, assists with system installations, provides system support.
Medical Software Companies Software Designer Software Tester	Designs and develops databases, performs various software testing, assists clients with system installations.



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ELIGIBILITY FOR ADMISSION:

Pass in any undergraduate program of 3 years' duration or equivalent with minimum aggregate of 50% marks in any science group. A candidate also must have passed in English (CORE or selective or functional) as a subject of studies in the qualifying examination

OR

Any health science graduates with MBBS /BAMS/ BHMS/BDS/Nursing/Allied Health Sciences or equivalent with minimum aggregate of 50% marks.

DURATION OF THE COURSE: 2 (two) academic years/4 semesters

- Theory : 1035 Hours
- Field Experience: 135 Hours
- Practical: 540 Hours
- Projects : 900 Hours

MEDIUM OF INSTRUCTION:

English shall be the medium of instruction for all the subjects of study and for examination of the course.

Examination:

- A candidate shall be declared to have passed the examination if he or she obtains the following
- 50% marks in the university examination and 50% marks in internal assessment in both Theory & Practical.
- If the candidate fails in either theory or Practical paper, he or she has to reappear for both the papers (Theory & Practical).
- Candidate who fails in any subject shall be permitted to continue the studies into second Semester, However the candidate will have to pass in all subjects before appearing for third semester examination. The maximum period to complete the course successfully should not exceed 4 years.
- 80 % attendance for theory & 90 % in Practical is the eligibility for appearing for examination.



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EVALUATION & GRADING SYSTEM CRITERIA:

Evaluation & grading (**Manual Relative grading**) of students shall be based on **GPA** (Grade point average) & **CGPA** (Cumulative grade point average).

LETTER GRADING SYSTEM:

Letter Grade	Credit value (Grade Value)
A+	10
A	9
B	8
C	7
D	6
E	5
F	0

CREDIT DETAILS:

Teaching /Learning Activity	Hours	Credits
Theory		
• Lectures:	15 hours	= 1 Credit
• Experiential	45 hours	= 1 Credit
Practical	30 hours	= 1 Credit

Project: 30hours/week= 1 Credit

Credit Includes: L – Lectures, T- Tutorials, P- Practical, and PR – Project.



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Curriculum Outline

First Semester

Course Code	Course/Subject Title	Theory		Experiential		Practical		Total	
		Credits	Hrs	Credits	Hrs	Credits	Hrs	Credits	Hrs
MHIM01	Anatomy & Physiology	6	90	-	-			6	90
MHIM02	Fundamentals of Computer Applications & Data Base Management	7	105	-	-	2	60	9	165
MHIM03	Introduction to Health Information Management including Recent Advances	9	135	-	-	7	210	16	345
MHIM04	English & Communication skills *	2	30	-	-	-	-	2	30
TOTAL		24	360	-	-	9	270	33	630

Second Semester

Course Code	Course/Subject Title	Theory		Experiential		Practical		Total	
		Credits	Hrs	Credits	Hrs	Credits	Hrs	Credits	Hrs
MHIM05	Disease classification system	2	30	1	45	2	60	5	135
MHIM06	Medical Language	11	165	-	-	1	30	12	195
MHIM07	Bio Statistics & Research Methodology	6	90	1	45	1	30	8	165
MHIM08	Pharmacology*	3	45	-	-	-	-	3	45
TOTAL		22	330	2	90	4	120	28	540



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Third Semester

Course Code	Course/Subject Title	Theory		Experiential		Practical		Total	
		Credits	Hrs	Credits	Hrs	Credits	Hrs	Credits	Hrs
MHIM09	Health Care Financing	8	120	-	-	1	30	9	150
MHIM10	Health & Bioinformatics	6	90	-	-	2	60	8	150
MHIM11	Clinical Workflow & Process Redesigning	4	60	-	-	1	30	5	90
MHIM12	Hospital Administration	7	105	1	45	1	30	9	180
	TOTAL	25	375	1	45	5	150	31	570

Fourth Semester

Course Code	Course/Subject Title	Theory		Experiential		Practical		Total	
		Credits	Hrs	Credits	Hrs	Credits	Hrs	Credits	Hrs
MHIM13	Project Work	-	-	-	-	30	900	30	900
	TOTAL	-	-	-	-	30	900	30	900

Semester	Theory		Experiential		Practical		Total	
	Credits	Hrs	Credits	Hrs	Credits	Hrs	Credits	Hrs
First Semester	24	360	-	-	9	270	33	630
Second Semester	22	330	2	90	4	120	28	540
Third Semester	25	375	1	45	5	150	31	570
Fourth Semester(Internship)	-	-	-	-	30	900	30	900
Total	71	1065	3	135	48	1440	122	2640



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SCHEME OF EXAMINATION

The distribution of marks in internal assessment, End Semester College Exam, and End Semester University Exam for each course is shown below.

FIRST SEMESTER								
S. No	Course	Internal Assessment			End Semester Collegiate Exam	End Semester University Exam	Duration	Total Marks
		Continuous Assessment	Sessional Exam	Total Internal Marks				
Theory								
1	Anatomy & Physiology	30	20	50		100	3	150
2	Fundamentals of Computer Applications & Data Base Management	30	20	50		100	3	150
3	Introduction to Health Information Management including Recent Advances	30	20	50		100	3	150
4	English & Communication skills *	30	20	50	50	-	2	100
Practical								
1	Fundamentals of Computer Applications & Data Base Management	30	20	50		50	-	100
2	Introduction to Health Information Management including Recent Advances	30	20	50		50	-	100



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II SEMESTER								
S.No	Course	Internal Assessment			End Semester Collegiate Exam	End Semester University Exam	Duration	Total Marks
		Continuous Assessment	Sessional Exam	Total Internal Marks				
Theory								
1	Disease classification system	30	20	50		100	3	150
2	Medical Language	30	20	50		100	3	150
3	Bio Statistics & Research Methodology	30	20	50		100	3	150
4	Pharmacology*	30	20	50		50	-	100
Practical								
1	Disease classification system	30	20	50		50	-	100

THIRD SEMESTER								
S.No	Course	Internal Assessment			End Semester Collegiate Exam	End Semester University Exam	Duration	Total Marks
		Continuous Assessment	Sessional Exam	Total Internal Marks				
Theory								
1	Health Care Financing	30	20	50		100	3	150
2	Health & Bioinformatics	30	20	50		100	3	150
3	Clinical Workflow & Process Redesigning	30	20	50		100	3	150
4	Hospital Administration	30	20	50		100	3	150



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IV SEMESTER								
S.No	Course	Internal Assessment			End Semester Collegiate Exam	End Semester University Exam	Duration	Total Marks
		Continuous Assessment	Sessional Exam	Total Internal Marks				
4	Dissertation Viva	30	20	50		100		150



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Anatomy & Physiology

Placement: First Semester

Course/Subject Title	Theory		Practical		Total	
	Credits	Hrs	Credits	Hrs	Credits	Hrs
Anatomy	3	45	-	-	6	90
Physiology	3	45				

Learning Outcomes:

On completion of the course, the student will be able to

- Identify all anatomical structures of the Human body
- Explain the technical functions of various organs and systems of the body
- Describe various body fluids, hormones and enzymes
- Describe the basic physiological concepts of various organ systems
- Differentiate abnormal structures and functions of the organ systems

Unit	Time (Hrs)	Content	Teaching/ Learning Activities	Assessment Methods
I	5	General Anatomy: <ul style="list-style-type: none"> • Anatomical Position and Anatomical terms • Epithelium – Types and functions • Connective tissue – fibers and cells • Cartilage – type, structure and functions • Bone – types, structure and blood supply • Muscles – classification, structure and function • Neuron – types and structure, typical spinal nerve • Blood vessels – arteries, vein lymph vessels, lymph nodes, structure of lymph node • Joints – classification, examples, structure of a typical synovial joint • Classification of synovial joint 	Lecture cum Discussion Use of Models, Videos	MCQ, Short Answer
II	5	Respiratory System Nasal Cavity, Larynx, Trachea, Thoracic Cage, Diaphragm, pleura, lungs	Lecture, Use of Models	MCQ, Short Answer, Essay
III	5	Cardiovascular system Mediastinum, Pericardium, heart, blood supply and nerve supply of heart, blood vessels in thorax, thoracic duct, major arteries and veins of head and neck, Major arteries and veins of abdomen and pelvis	Lecture cum Discussion. Use of Models, Videos	MCQ, Short Answer Essay
IV	5	Gastrointestinal system Tongue, salivary glands, pharynx, esophagus, stomach, small intestine, large intestine, rectums and anal canal, Difference between jejunum and large intestine, difference between small and large intestine, liver, extra-hepatic biliary apparatus, pancreas	Lecture cum Discussion. Use of Models, Videos	MCQ, Short Answer Essay



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Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
V	4	Urinary System Kidney, Ureter, urinary bladder, urethra		
VI	4	Male Reproductive System Testes, spermatic cord, vas deferens, prostate, seminal vesicles and ejaculatory duct		
VII	4	Female Reproductive System Uterus, uterine tube, ovary		
VIII	4	Endocrine Glands Pituitary gland, thyroid gland, parathyroid gland, suprarenal gland		
IX	5	Nervous System: Central Nervous System Spinal cord, Brain, External feature of medulla oblongata, cerebellum, Attachment of cranial nerve to the brain stem, Mid-brain, Diencephalon, Corpus striatum, Cerebral hemispheres, fiber system of brain, blood supply of brain, ventricle, CSF production and circulation		
X	4	Special Senses <ul style="list-style-type: none"> • Gross anatomy of eye • Gross anatomy of external, middle and internal ear • Skin 	Lecture cum Discussion. Use of Models, Videos	MCQ, Short Answer, Essay

Physiology

Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
I	7	Basic concepts and Nerve physiology <ul style="list-style-type: none"> • Transport across cell membrane: Passive transport-diffusion, facilitated diffusion, osmosis; Active transport-primary and secondary active transport • Body fluids: Distribution of total body water, ionic composition of body fluids • Neuron: Differences in structure and function of myelinated and unmyelinated nerve fibers • Resting membrane potential and Action potential 	Lecture cum Discussion. Use of Videos	MCQ, Short Answer, Essay
II	7	Muscle physiology <ul style="list-style-type: none"> • Muscle: Classification, characteristic features of skeletal, cardiac and smooth muscles 		



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Unit	Time (Hrs)	Content	Teaching Learning Activities	Assessment Methods
		<ul style="list-style-type: none"> Skeletal muscle: Structure, types of muscle fibers, neuromuscular transmission, excitation contraction coupling, rigor mortis Smooth muscle: Types 	Lecture cum Discussion. Use of Videos	MCQ, Short Answer, Essay
III	7	Blood <ul style="list-style-type: none"> Composition and functions of blood Plasma proteins and their functions Red Blood Cells: Erythropoiesis- Stages and regulation Hemoglobin: Normal values, variations and functions White Blood Cells: Types, normal values and functions Platelets: Normal range, functions, purpura <ul style="list-style-type: none"> Coagulation or clotting of blood: Clotting factors, Intrinsic and extrinsic mechanisms, hemophilia Anticoagulants: Classification and examples Blood groups: ABO and Rh systems, importance of blood grouping, hazards of blood transfusion, erythroblastosis fetalis Functions of lymph 	Lecture cum Discussion. Use of Videos	MCQ, Short Answer, Essay
IV	7	Cardiovascular system <ul style="list-style-type: none"> Structure and innervation of heart and blood vessels Cardiac muscle: Properties, Cardiac cycle Heart sounds: Differences between first and second heart sounds Electrocardiogram (ECG): waves, intervals and uses Heart rate: Normal value, variations, regulation Cardiac output: Definition, normal value, variations and regulation: role of heart rate, stroke volume and myocardial contractility, muscular exercise and cardiac output Blood pressure: Definition, normal value, factors influencing BP, short-term regulation 	Lecture cum Discussion. Use of Videos	MCQ, Short Answer, Essay
V	7	Respiratory system <ul style="list-style-type: none"> Organization: air passages, lungs, respiratory membrane Mechanism of breathing: Inspiration, expiration, pulmonary ventilation, alveolar ventilation Graphical representation of pressure changes 	Lecture cum Discussion. Use of Videos	MCQ, Short Answer, Essay



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Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
		<ul style="list-style-type: none"> during respiration Spirogram Oxygen transport: Forms, oxygen dissociation curve Carbon dioxide transport: Forms of transport, mechanism Regulation of respiration: neural and chemical regulation Cyanosis, hypoxia-types, types of hypoxia in which cyanosis occurs Definitions of apnea, dyspnea, asphyxia 	Lecture cum Discussion. Use of Videos	MCQ, Short Answer, Essay
VI	5	Special senses <ul style="list-style-type: none"> Vision: Cross-section of eye Functions of aqueous humor Visual pathway, visual field defects Accommodation to near vision, light reflex, refractory errors of the eye Visual acuity Hearing: Structure and functions of external, middle and inner ear Mechanism of hearing Vestibular apparatus: Parts and functions Receptors for taste and smell sensation 	Lecture cum Discussion. Use of Videos	MCQ, Short Answer, Essay
VII		Gastro Intestinal System <ul style="list-style-type: none"> Functions of organs of Digestive tract Functions of Liver, gall bladder & Pancreas Composition & Functions – Saliva, gastric Juice, gastric secretions, bile, pancreatic Juice, secretions of small & Large Intestine Digestion & absorption of food 	Lecture cum Discussion. Use of Videos	MCQ, Short Answer, Essay
VIII		Renal System <ul style="list-style-type: none"> Functions of organs of Urinary system Regulation of Renal function' 	Lecture cum Discussion. Use of Videos	MCQ, Short Answer, Essay
IX		Reproductive System <ul style="list-style-type: none"> Female Reproductive system – Menstrual Cycle, functions of female Reproductive organs, Fertilization, Functions of Breast Male Reproductive System –Spermatogenesis 	Lecture cum Discussion. Use of Videos	MCQ, Short Answer, Essay
X		Endocrine system <ul style="list-style-type: none"> Functions of the Hormones of endocrine glands- Pituitary gland, Thyroid, Parathyroid, Thymus, Pancreas and Adrenal gland 	Lecture cum Discussion. Videos	MCQ, Short Answer, Essay



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Internal Assessment: Anatomy & Physiology (50 marks)

Item	Marks allotted	Weightage	Marks
Assignment			
Written Assignment- 1	20	20%	10
Presentation 1	20	40%	20
Internal Examination			
Sessional Exam I	30 marks	40%	20
Sessional Exam II	30 marks		
Total	100 marks	100%	50

University Examination: Anatomy & Physiology

S.No	Assessment	Marks
1.	Section A : Anatomy	50 marks
2.	Section B : Physiology	50 marks
Grand Total		100 marks

Final Assessment: Anatomy & Physiology

S.No	Assessment	Marks
1.	Internal Assessment	50 Marks
2.	University Exam - Duration 3 hours	100 Marks
Grand Total		150 Marks



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Fundamentals of Computer Applications & Data Base Management

Placement: First Semester

Course/Subject Title	Theory		Experiential		Practical		Total	
	Credits	Hrs	Credits	Hrs	Credits	Hrs	Credits	Hrs
Fundamentals of computer Applications & Data Base Management	7	105	-	-	2	60	9	165

Learning Outcomes:

- Describe the Computer operating systems and languages
- Demonstrate skills in using Microsoft Word, Power point, Excel
- Apply the knowledge of computer networks.
- Explain the database processing
- Design, develop and evaluate data base systems

Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
I	T-3	Introduction to computer: Introduction, Characteristics of computer, block diagram of computer, Generations of computer, computer languages. Operating systems –concepts & types	Lecture & Discussion	MCQ, Short Answer Questions
II	T-3	Introduction to computers Hardware, Software <ul style="list-style-type: none"> • Input output devices: Input devices (keyboard, point and draw devices, data scanning devices, digitizer, electronic card reader, voice recognition devices, vision-input devices), output devices (monitors, pointers, plotters, screen image projector, voice response systems). • Processor and memory: The Central Processing Unit (CPU), main memory. • Storage Devices: Sequential and direct access devices, magnetic tape, magnetic disk, optical disk, mass storage devices. 	Lecture & Discussion To install different software	MCQ, Short Answer Questions
III	T-4 P-5	Introduction of windows: History, Features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows (opening, closing, moving, resizing,	Lecture & Discussion Practical Session	MCQ, Short Answer Questions



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Unit	Time (Hrs)	Content	Teaching/ Learning Activities	Assessment Methods
		minimizing and maximizing, etc.). Windows, Windows Accessories, Control Panel, Multi – Tasking Features of Windows,		
IV	T-10 P-5	Microsoft Word (Basics, Formatting, Tables, Page design, Mail merges and creating documents), Introduction to MS-Word: introduction, components of a word window, creating, opening and inserting files, editing a document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge.	Lecture & Discussion Practical Session	MCQ, Short Answer Questions
V	T-15 P-10	Introduction to power-point: introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs. MS-PowerPoint (Toolbars, Drawing Palette, Working with slides),	Lecture & Discussion Practical Session	MCQ, Short Answer Questions
VI	T-15 P-10	MS-Excel (Introduction Cell formatting, Charts and graphic objects, , Database, Pivot table, Data validation, , Dynamic data range and Controls, File protection, what if analysis and templates),	Lecture & Discussion Practical Session	MCQ, Short Answer Questions
VII	T-10 P-5	Computer networks & and HTML: Introduction, types of networks (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree, hybrid), components of network. <ul style="list-style-type: none"> • Internet and its Applications: definition, brief history, basic services (E-Mail, File Transfer Protocol, telnet, the World Wide Web (WWW)), www browsers, use of the internet. • FTP TCP / IP • Electronic mail • HTML Application of Computers in clinical settings.	Lecture & Discussion Practical Session	MCQ, Short Answer Questions, Essay questions
VIII	T-10 P-5	Database <ul style="list-style-type: none"> • Define database • Explain terms used in database systems 	Lecture & Discussion Practical Session	MCQ, Short Answer Questions, Essay questions



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Unit	Time (Hrs)	Content	Teaching/ Learning Activities	Assessment Methods
		<ul style="list-style-type: none"> • Describe common functions of database systems • Use database to create, input, edit, and display fields and records • Analyze structure of database file • Perform calculations with a data base file • Alter structure of database file • Sort records based on multiple fields • Identify advanced database technology • Use appropriate reference materials • Utilize relational database • Enter elements into database • Proofread database • Explain database • Design report formats • Transfer data to and from remote database • Print reports using data from multiple databases • Use database files with other application software • Verify accuracy of output (e.g., edit reports) 		
IX	T-5	Operating Systems <ul style="list-style-type: none"> • Identify operating systems and their attributes (i.e., DOS, Unix, Macintosh, Windows) • Identify the advantages and disadvantages of the computer to individuals and business. • Identify the roles and equipment used for input, processing, and output in an informationsystem. • Identify correct safety procedures 	Lecture & Discussion Practical Session	MCQ, Short Answer Questions, Essay Questions
X	T-5 P-5	Basic Data Processing <ul style="list-style-type: none"> • Input, update and store data into records in an existing database • Open stored spreadsheet, input and update data into spreadsheet, store revised spreadsheetand print revised spreadsheet Information Processing Cycle <ul style="list-style-type: none"> • Describe difference between data files and program files 	Lecture & Discussion Practical Session	MCQ, Short Answer Questions, Essay Questions



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Unit	Time (Hrs)	Content	Teaching/ Learning Activities	Assessment Methods
XI	T-5 P-5	Database and Spreadsheet Operations Plan and create database, input and update data into records, store database and print quickreports from database <ul style="list-style-type: none">• Create spreadsheet, input data into spreadsheet, update data in spreadsheet and storespreadsheet. Introduction to Spread sheet packages	Lecture & Discussion Practical Session	MCQ, Short Answer Questions, Essay Questions
XII	T-10 P-5	MS-Access <ul style="list-style-type: none">• Data Modeling• Introduction to MS-Access• Forms, Filters and Queries, Charts and Reports Command Buttons, Macros and Database Maintenance	Lecture & Discussion Practical Session	MCQ, Short Answer Questions
XIII	T-5	Visual Basics <ul style="list-style-type: none">• Introduction to VB• Programming fundamentals	Lecture & Discussion	MCQ, Short Answer Questions
XIV	T-5 P-5	Hospital Information System (HIS) with Electronic Medical Records (EMR) or ElectronicHealth Information Management System (HMIS)	Lecture & Discussion Practical Session	MCQ, Short Answer Questions

Practical on fundamentals of computers -

1. Learning to use MS office: MS word, MS PowerPoint, MS Excel.
2. To install different software.
3. Data entry efficiency
4. Miscellaneous: Scanning of documents (of various sizes) and in different conditions (for e.g., mutilated), file naming, saving, uploading, etc. Copying of original medical document, back up of old data/ records.

Assignment/Revision,

To design and develop various standardized formats of patient health records.



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**Internal Assessment: Fundamentals of Computer Applications & Data Base Management
(Theory -50 M a r k s)**

Item	Marks allotted	Weightage	Marks
Assignment			
Assignment	20	20%	10
Project	20	40%	10
Internal Examination			
Sessional Exam I	30 marks	40%	40
Sessional Exam II	30 marks		
Total	100 marks	100%	50

University Examination-Theory:

S.No	Assessment	Marks
1.	Fundamentals of computer	100 marks
Grand Total		100 marks

**Final Assessment: Fundamentals of Computer Applications & Data Base Management -
Theory**

S.No	Assessment	Marks
1.	Internal Assessment	50 Marks
2.	University Examination	100 Marks
Grand Total		150 Marks

**Internal Assessment: Fundamentals of Computer Applications & Data Base Management
(Practical -50 M a r k s)**

Item	Marks allotted	Weightage	Marks
Assignment			
Assignment	20	20%	10
Project	20	40%	10
Internal Examination			
Sessional Exam I	30 marks	40%	40
Sessional Exam II	30 marks		
Total	100 marks	100%	50



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University Examination- Practical:

S.No	Assessment	Marks
1.	Fundamentals of computer	50 marks
Grand Total		50 marks

**Final Assessment: Fundamentals of Computer Applications & Data Base Management
-Practical**

S.No	Assessment	Marks
1.	Internal Assessment	50 Marks
2.	University Examination	50 Marks
Grand Total		100 Marks



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Introduction to The Health Information Management

Placement: First Semester

Course/Subject Title	Theory		Experiential		Practical		Total	
	Credits	Hrs	Credits	Hrs	Credits	Hrs	Credits	Hrs
Introduction To The Health Information Management Profession	9	135	-	-	7	210	16	345

Learning Outcomes:

- Describe the Characteristics & types of Medical Records
- Explain the characteristics of Health information management
- Demonstrate Filing & storing methods of Medical Records
- Demonstrate Quality control in Medical Record Department
- Demonstrate skills in numbering and filing of Medical records
- Demonstrates skills in indexing, color coding of files and registering the Medical records
- Explain the Medical Record Department Management
- Demonstrate skill in maintaining Computerized Medical records

Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
I	T-10 P-5	Introduction to Health Information Management: <ul style="list-style-type: none"> • Important event in history of medicine and medical documentation, personalities and their contribution to medicine and Health Information Management. • Definition, Goals & Objective, Characteristics, Purpose, Values of Health Information Management to the various users • Definition, Characteristics of 'Good' Medical Record • Values of 'Good' Medical Record to various users • Required Characteristics of entries in medical Records • Recent Advances in Health Information Management 	Lecture & Discussion	MCQ, Short Answer Questions
II	T-5 P-5	Medical Records for different patient encounters with health care facility <ul style="list-style-type: none"> • Ambulatory Care Records {Emergency & Outpatient Records} • Clinical Records in Long Term Care and Rehabilitation Facilities, Mental Health Records 	Lecture Handling of Medical Records	MCQ, Short Answer Questions



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Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
III	T-10 P-10	Numbering System of Health Information Management: Definition, merits and demerits of Unit, Serial, Units Serial numbering system.	Lecture Abstracting, chart tracking	MCQ, Short Answer Questions
IV	T-10 P-20	Filing Methods, Storage, and Retention <ul style="list-style-type: none"> • Numbering and Filing Systems • Filing • Storage- Microfilming and Disk Storage • Retention • Registers & Indexes • Record movement control & Tracking system • Definition, merits and demerits of Straight, Middle and Terminal Digit filing system. 	Lecture Abstracting, chart tracking	MCQ, Short Answer Questions
V	T-10 P-20	Indexes and Registers: Definition, Format and Uses of: Master Patient Index Card, Disease Index Card, Physician Index Card, Operation Index Card, Various Registers used for the maintenance of patient information.	Lecture Abstracting, chart tracking	MCQ, Short Answer Questions
VI	T-10 P-20	Organizational Aspects of Health Information Management Department/Services <ul style="list-style-type: none"> • Policies • Functions • Location, Space and Layout • Equipment • Forms Designing and Control • Medical Records Flow and Processing 	Lecture cum Discussion	MCQ, Short Answer Questions, Essay questions
VII	T-10 P-10	Organizational Aspects of the Centralized Admitting Services <ul style="list-style-type: none"> • Principles of Identification of a Patient • Methods of Collection of Identification Data • Types of Central Admitting Services • Admitting Policies • Procedure Outlines for Admissions • Flow of Records following Admissions • Advantages of good Admitting Policies and Procedures • Pre-requisites for smooth & efficient functioning of the Centralized Admitting Services 	Lecture cum Discussion	MCQ, Short Answer Questions Essay questions



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Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
VIII	T-15 P-20	Medical Record Department Management <ul style="list-style-type: none"> • Planning, Organizing, Directing and Controlling • Personnel • Principal Responsibilities and Duties of the Medical Record Administrator/Director • Tools of Management in the Hands of the Medical Record Administrator/Director • Developing Intradepartmental Relationship, Interdepartmental Relationships with various Departments of the Hospital 	Lecture, Patient registration, Transcription and functions of MRD	MCQ, Short Answer Questions Essay questions
IX	T-10 P-10	Contents of Health Information Management & form designing: Definition, Purpose and Contents of various forms used to document the patient health information. Various rules involve in form designing <ul style="list-style-type: none"> • Standard Order of Arrangement of Medical Record forms 	Lecture cum Discussion	MCQ, Short Answer Questions Essay questions
X	T-10 P-15	Format of Health Information Management: Definition, Format, Advantages & Disadvantages of Source Oriented Health Information Management, Integrated Health Information Management, Problem oriented Health Information Management	Lecture cum Discussion	MCQ, Short Answer Questions Essay questions
XI	T-10 P-5	Management and Quality Control of Health Information Management: <ul style="list-style-type: none"> • Movement and Control of various medical records in hospital and Health Information Management department, • various physical facilities required for the maintenance of Health Information Management. • Basic rules for the handling of Health Information Management in health care facilities. • Incomplete Record Control 	Lecture cum Discussion	MCQ, Short Answer Questions Essay questions
XII	T-10 P-20	Health Care Statistics, Data Collection & Presentation <ul style="list-style-type: none"> • Inpatient census and rates computed from it. • Ambulatory care statistics, Long term Care Statistics 	Lecture cum Discussion	MCQ, Short Answer Questions Essay



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Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
		<ul style="list-style-type: none"> Processing and reporting of Reproductive Health Statistics Reporting of Notifiable Diseases to Public Health Authorities, <p>Methods involved in quantitative and qualitative Analysis</p>	Deficiency analysis	questions
XIII	T-5 P-20	Computerization of Health Information System: <ul style="list-style-type: none"> Needs of computerization, Process involved in computerization, Advantages and Disadvantages 	Lecture cum Discussion	MCQ, Short Answer Questions Essay questions
XIV	T-10 P-20	Microfilming of medical records: Microfilming Process, Equipment required for microfilming, Merits and Demerits of Microfilming Color Coding of Medical Records: Definition, Reason, Types, Advantages, Storage medium	Lecture cum Discussion Document imaging	MCQ, Short Answer Questions Essay questions

HIM Practicum

Area Of Posting	Hours
OPD	50
Ward	40
ICU	40
Medical Record Department	80

Internal Assessment: Health Information Management –Theory (50 marks)

Item	Marks allotted	Weightage	Marks
Assignment			
Written Assignment- 1	20 marks	20%	10
Presentation - 2	20 marks	40%	10
Internal Examination			
Sessional Exam I	30 marks	40%	20
Sessional Exam II	30 marks		
Total	100 marks	100%	50



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University Examination: Theory

S.No	Assessment	Marks
1.	Health Information Management	100 marks
Grand Total		100 marks

Final Assessment: Health Information Management-Theory

S.No	Assessment	Marks
1.	Internal Assessment	50 Marks
2.	University Examination	100 Marks
Grand Total		150 Marks

Internal Assessment: Health Information Management (Practical -50 M a r k s)

Item	Marks allotted	Weightage	Marks
Assignment			
Assignment	20	20%	10
Project	20	40%	10
Internal Examination			
Sessional Exam I	30 marks	40%	40
Sessional Exam II	30 marks		
Total	100 marks	100%	50

University Examination- Practical:

S.No	Assessment	Marks
1.	Health Information Management	50 marks
Grand Total		50 marks

Final Assessment: Health Information Management -Practical

S.No	Assessment	Marks
1.	Internal Assessment	50 Marks
2.	University Examination	50 Marks
Grand Total		100 Marks



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English for Health Professionals and Communication Skills

Placement: First Semester

Course/Subject Title	Theory		Experiential		Practical		Total	
	Credits	Hrs	Credits	Hrs	Credits	Hrs	Credits	Hrs
English For Health Professionals And Communication Skills	2	30	-	-			2	30

Learning Outcomes:

- Describe the communication process
- Read, Listen, Interpret, Speak and Write in different situations
- Apply effective communication Skills in Hospitals

Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
I	6	Basics of Communication: <ul style="list-style-type: none"> • Process and models of communications • Types of communications: <ul style="list-style-type: none"> ○ Oral communication (Verbal, telephonic, face-to-face) ○ Written Communication ○ Non-verbal communication & Body language • Barriers to communications • How to improve communication and spoken skills? • Barriers of communication & how to overcome 	Lecture cum Discussion	MCQ & Short Answer Questions
II	6	Reading Skills: <ul style="list-style-type: none"> • Sources of Information • Types of readings: Skimming, Scanning, intensive / loud / silent reading, oral, extensive, map reading • Understanding what to read- Part played by propositions • Techniques of reading 3Q3R 	Lecture Cum Discussion Sample passages for reading with comprehension exercises	MCQ & Short Answer Questions Worksheet & Exercises
III	6	Listening skills <ul style="list-style-type: none"> • Definition of listening • Types of Listening • Purposes of listening • Obstacles for listening 	Lecture Cum Discussion Audio & Videos	MCQ & Short Answer Questions Listening to Audio ,Video



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Unit	Time (Hrs)	Content	Teaching/ Learning Activities	Assessment Methods
		<ul style="list-style-type: none"> Contexts of listening To be a good listener Listening to a Lecture Factors helping listening: Semantic markers, focused listening Facilitating understanding Static & process description- gambits		
IV	6	Speaking Skills <ul style="list-style-type: none"> Formal & Informal Conversation: Agreeing, Emphasizing, thinking ahead, correcting oneself, interrupting, politely expressing reservations, opinions, disagreeing, accepting invitations declining invitations etc. Telephone Conversation Interviews Visual Presentation 	Lecture Cum Discussion on Exercise on Grammar and Usage. Business Communication Skills.	MCQ & Short Answer Questions Assessment of With focus on speaking - Conversations, discussions, dialogues, short presentations pronunciation
V	6	Writing Skills <ul style="list-style-type: none"> Objectives- Difference between spoken and written form How words are formed into phrases and clauses Tenses, Abbreviations, Punctuations Writing Sentences Writing Paragraphs: The Development of a Paragraph Cohesion, Coherence Summary, essay writing, précis writing Formal Letters – personal, applications, bio-data, Official correspondence: Outgoing correspondence, replying incoming correspondence, writing circulars, notices, charge memos Writing Reports Informal letters Tables, Charts and Graphs Medical Transcription 	Teaching the different methods of writing like letters, E-mails, report, case study, collecting the patient data etc. Basic compositions, journals, with a focus on paragraph form and organization	Assessment with worksheets



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Unit	Time (Hrs)	Content	Teaching/ Learning Activities	Assessment Methods
VI	6	<p>Effective communication in Hospitals:</p> <ul style="list-style-type: none"> • Communicating to match the mission and vision of the institution • The strategy of keep informed • The nature of communications in a hospital • Upward and Downward Communications • Reporting of feedbacks • Intra and interdepartmental communications • Communications with Medical Staff, Paramedical staff and Support Services Staff • The care provider – customer relationship • Patient as VIP and his rights; Patient's locus standing, his agony, pains and tensions • Directing patients to right destinations • Giving hope to the hopeless • Communications with the sick and injured • Communications with teens and youngsters, middle aged and the aged • Keeping up good impressions and manners before patients and their attendants • Body language – How can you say it better than words? • Communicating practically and technically feasible solutions • How to say “no” graciously? • Effective Intra and interdepartmental communications • Common problems arising out of bad quality communications and troubleshooting techniques 	Lecture cum Discussion & Role play	MCQ & Short Answer Questions, Essay Questions



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Internal Assessment: English For Health Professionals And Communication Skills (50 marks)

Item	Marks allotted	Weightage	Marks
Assignment			
Written Assignment- 1		20%	10
Presentation - 2		40%	20
Internal Examination			
Sessional Exam I	30 marks	40%	20
Sessional Exam II	30 marks		
Total	100 marks	100%	50

Collegiate Examination:

S.No	Assessment	Marks
1.	English For Health Professionals And Communication Skills	50 marks
Grand Total		50 marks

Final Assessment: English For Health Professionals And Communication Skills

S.No	Assessment	Marks
1.	Internal Assessment	50 Marks
2.	Collegiate Examination	50 Marks
Grand Total		100 Marks



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Second Semester



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Disease Classification Systems

Placement: Second Semester

Course/Subject Title	Theory		Experiential		Practical		Total	
	Credits	Hrs	Credits	Hrs	Credits	Hrs	Credits	Hrs
Disease Classification Systems	2	30	1	45	2	60	5	135

Learning Outcomes

- Identify standard clinical terminologies
- Identify appropriate clinical classification system
- Apply the disease classification system in Health information system

Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
I	T-5 E-5	International Classification of Diseases (ICD-10) and Surgical Procedures (ICD-9CM) and SNOMED-CT	Lecture & Use of videos	MCQ, Short Answer Questions
II	T-15 E-15 P-30	Nomenclatures and Classification Systems: <ul style="list-style-type: none"> • Standard Nomenclatures of diseases (SNDO) • Current Medical Information Terminology • Systematized Nomenclature of Pathology (SNOP) • Systematized Nomenclature of Medicine (SNOMED) • Common Procedures Coding System (HCPCS) • Current Procedural Terminology • International Classification of Functioning, Disability and Health (ICF) • Case-Mix Classifications • Diagnosis Related Groups • ICD – 9 (CM) • ICD – 11 • ICD- Oncology (ICD - O) 	Lecture & Use of Videos Demonstration Practice Sessions	MCQ, Short Answer Questions, Essay, Assessment of Skill



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Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
III	T-10 E-25 P-30	<ul style="list-style-type: none"> • Coding of final diagnosis and secondary diagnosis. • Disease and operation nomenclatures, International Classification of Disease 10, International Classification of Disease – 9CM indexing of patient care data. <ul style="list-style-type: none"> • Introduction and usage of International Classification of Disease in practical's • International Classification of Diseases <ul style="list-style-type: none"> • ICD-11, ICD-9 CM (Surgical Procedures) • CPT – Current Procedural Terminology (Introduction) <ul style="list-style-type: none"> • HCPCS – Healthcare Common Procedure Coding System (Introduction) • ICD-11 - Alpha-numeric coding <ul style="list-style-type: none"> • Volume 1 – Tabular list • Volume 2 – Instruction manual • Volume 3 – Alphabetical Index • Classification of Diseases according to Clinical Pertinence • ICD-9CM (Procedure) coding – International Classification of Diseases – Clinical modification <ul style="list-style-type: none"> • CPT – Introduction of CPT and HCPCS – 3 levels of codes • SNOMED-CT 	<p>Lecture & Use of videos</p> <p>Demonstration</p> <p>Practice Sessions</p>	<p>MCQ, Short Answer Questions, Essay, Assessment of Skill</p>



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Internal Assessment: Disease Classification Systems-Theory (50 marks)

Item	Marks allotted	Weightage	Marks
Assignment			
Assignment	20	20%	10
Project	20	40%	10
Internal Examination			
Sessional Exam I	30 marks	40%	20
Sessional Exam II	30 marks		
Total	100 marks	100%	50

University Examination:

S.No	Assessment	Marks
1.	Disease Classification Systems	100 marks
Grand Total		100 marks

Final Assessment: Disease Classification Systems

S.No	Assessment	Marks
1.	Internal Assessment	50 Marks
2.	University Examination	100 Marks
Grand Total		150 Marks

Internal Assessment : Disease Classification Systems (Practical -50 M a r k s)

Item	Marks allotted	Weightage	Marks
Assignment			
Assignment	20	20%	10
Project	20	40%	10
Internal Examination			
Sessional Exam I	30 marks	40%	40
Sessional Exam II	30 marks		
Total	100 marks	100%	50



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University Examination- Practical: Disease Classification Systems

S.No	Assessment	Marks
1.	Disease Classification Systems	50 marks
Grand Total		50 marks

Final Assessment: Disease Classification Systems -Practical

S.No	Assessment	Marks
1.	Internal Assessment	50 Marks
2.	University Examination	50 Marks
Grand Total		100 Marks



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Medical Language

Placement: Second Semester

Course/Subject Title	Theory		Experiential		Practical		Total	
	Credits	Hrs	Credits	Hrs	Credits	Hrs	Credits	Hrs
Medical Language	11	165	-	-	1	30	12	195

Learning Outcomes:

- Describe the Medical Terminologies
- Identify the Stem Words/Root
- Explain the Prefix and Suffixes
- Enumerate the surgical procedures, diseases, disorders and dysfunctions.
- Explain the concepts of body systems
- Identify the terminologies of body systems, diseases, diagnostic, therapeutic tests and procedures
- Develop competency in writing medical terms correctly
- Identify the standard medical abbreviations

Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
I	T-10 P-10	<p>Introduction</p> <ul style="list-style-type: none"> • Origin of medical terms historical perspective • Various uses and application of medical terms • Purpose of learning medical terminology <p>Components of Medical Terms</p> <ul style="list-style-type: none"> • Prefixes • Suffixes <p>Roots and Combining forms</p> <p>External Anatomy and Internal Anatomy</p> <p>Additional Lists and their combining forms grouped as:</p> <ul style="list-style-type: none"> • Verbs • Adjectives • Body Fluids • Body Substances • Chemicals • Colors • Phobias 	<p>Lecture Cum Discussion</p> <p>Practice session</p>	<p>MCQ.</p> <p>Short Answer</p>
II	T-10 P-10	<p>Stem Words/Root</p> <ul style="list-style-type: none"> • Musculo-skeletal system • Respiratory system • Cardiovascular system 	<p>Lecture Cum Discussion</p> <p>Practice session</p>	<p>MCQ.</p> <p>Short Answer</p>



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Unit	Time (Hrs)	Content	Teaching/ Learning Activities	Assessment Methods
		<ul style="list-style-type: none"> • Digestive system • Endocrine system • CNS system • Urinary system • Reproductive system • Organs of special sense • Integumentary system 		
III	T-10 P-10	Prefixes <ul style="list-style-type: none"> • Definition, Various Prefixes, meaning and example terms • Pseudo Prefixes – meaning & Example terms Suffixes <ul style="list-style-type: none"> • Definition & Types of suffixes • Various Suffixes, meaning and example terms 	Lecture Cum Discussion Practice session	MCQ. Short Answer
IV	T-10	Terms Relating to the Body as a Whole <ul style="list-style-type: none"> • Study of the Body • Basic Structures • Cells • Tissues • Organs • Systems • Directions • Anatomic Planes and Position 	Lecture Cum Discussion Practice session	MCQ. Short Answer
V	T-10	The Skeletal System <ul style="list-style-type: none"> • Pathologic conditions (Inflammations and Infections) • Hereditary, Congenital and Developmental Disorders • Fractures • Metabolic and Deficiency Diseases • Symptomatic Terms • Diagnostic Terms • Oncology Terms • Operative Terms • Laboratory Tests and Procedures • Standard Abbreviations 	Lecture Cum Discussion Practice session	MCQ. Short Answer
VI	T-10	The Muscular System <ul style="list-style-type: none"> • Pathologic Conditions • Degenerative and Innervative Disorders • Hereditary, Congenital and Developmental Disorders • Symptomatic Terms 	Lecture Cum Discussion Practice session	MCQ. Short Answer



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Unit	Time (Hrs)	Content	Teaching/ Learning Activities	Assessment Methods
		<ul style="list-style-type: none"> • Diagnostic Terms • Oncology Terms • Operative Terms • Laboratory Tests and Procedures. • Standard Abbreviations 		
VII	T-10	Integumentary System <ul style="list-style-type: none"> • Pathologic Conditions • Fungal, Viral and Parasitic Infections • Hereditary, Congenital and Developmental Disorders • Symptomatic Terms • Diagnostic Terms • Oncology Terms • Operative Terms • Laboratory Tests and Procedures 	Lecture Cum Discussion Practice session	MCQ. Short Answer
VIII	T-10	The Cardiovascular system <ul style="list-style-type: none"> • Pathological Conditions • Hemorrhages and related Conditions • Hereditary, Congenital and Developmental Disorders • Symptomatic Terms • Diagnostic terms • Oncology Terms • Operative Terms • Laboratory Tests and Procedures • Standard Abbreviations 	Lecture Cum Discussion Practice session	MCQ. Short Answer
IX	T-10	The Respiratory System <ul style="list-style-type: none"> • Pathologic Conditions • Symptomatic Terms • Diagnostic Terms • Oncology Terms • Operative Terms • Laboratory Tests and Procedures • Standard Abbreviations 	Lecture Cum Discussion Practice session	MCQ. Short Answer
X	T-10	The Gastro-Intestinal System <ul style="list-style-type: none"> • Pathologic Conditions • Hereditary, Congenital and Developmental Disorders • Symptomatic Terms • Diagnostic Terms 	Lecture Cum Discussion Practice session	MCQ. Short Answer



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Unit	Time (Hrs)	Content	Teaching/ Learning Activities	Assessment Methods
		<ul style="list-style-type: none"> • Oncology Terms • Surgical Procedures • Laboratory Tests and Procedures <p align="center">Standard Abbreviations</p>		
XI	T-10	<p>The Genito-Urinary System</p> <p>(A) Urinary Tract</p> <ul style="list-style-type: none"> • Pathologic Conditions • Hereditary, Congenital and Developmental Disorders • Symptomatic Terms • Diagnostic Terms • Oncology • Surgical Procedures • Laboratory Tests and Procedures • Standard Abbreviations <p>(B) Male Reproductive Organs</p> <ul style="list-style-type: none"> ▪ Hereditary, Congenital and Developmental Disorders ▪ Sexually Transmitted Disorders (STD) ▪ Symptomatic Terms ▪ Diagnostic Terms ▪ Operative Procedures <p>(C) Female Reproductive Organs</p> <ul style="list-style-type: none"> • Hereditary, Congenital and Developmental Disorders • Sexually Transmitted Disorders (STD) • Symptomatic Terms • Diagnostic Terms • Operative Procedures • Laboratory tests and Procedures 	Lecture Cum Discussion Practice session	MCQ. Short Answer
XII	T-10	<p>The Endocrine System (Pituitary-Anterior & Posterior: Hypothalamus; Thyroid; Parathyroid; Adrenal-Cortex and Medulla; Pineal body; Pancreas; Gonads-Ovaries & Testes & Thymus)</p> <ul style="list-style-type: none"> • Pathologic Conditions • Hereditary, Congenital and Developmental Disorders • Symptomatic Terms 	Lecture Cum Discussion Practice session	MCQ. Short Answer



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Unit	Time (Hrs)	Content	Teaching/ Learning Activities	Assessment Methods
		<ul style="list-style-type: none"> Diagnostic Terms Oncology Surgical Procedures Laboratory Tests and Procedures Standard Abbreviations 		
XIII	T-10	The Nervous System (A) Neurological Disorders <ul style="list-style-type: none"> Pathologic conditions Hereditary Congenital and Developmental Disorders Circulatory Disturbances Other Organic Abnormalities Oncology Diagnostic Terms Surgical and other Procedures Laboratory Tests and Procedures 	Lecture Cum Discussion Practice session	MCQ. Short Answer
XIV	T-10	(B) Psychiatric Disorders <ul style="list-style-type: none"> Psychiatric Disorders Other Descriptive and Diagnostic Terms Various Tests Treatment Methods for Psychiatric Conditions 	Lecture Cum Discussion Practice session	MCQ. Short Answer
XV	T-5	The Sensory Organs (B) Sense of Vision <ul style="list-style-type: none"> Pathologic conditions Hereditary, Congenital and Developmental Disorders Diagnostic Terms Operative terms Oncology Vision Tests and Procedures 	Lecture Cum Discussion Practice session	MCQ. Short Answer
XVI	T-5	(C) Sense of Hearing <ul style="list-style-type: none"> Pathologic condition Hereditary, Congenital and Developmental Disorders Oncology Surgical Procedures Hearing Tests 	Lecture Cum Discussion Practice session	MCQ. Short Answer
XVII	T-5	(D) Sense of Smell <ul style="list-style-type: none"> Pathologic and Other terms Laboratory Tests 	Lecture Cum Discussion Practice session	MCQ. Short Answer
XVIII	T-5	(E) Sense of Smell <ul style="list-style-type: none"> Pathologic and Other terms Laboratory Tests 	Lecture Cum Discussion Practice session	MCQ. Short Answer
XIX	T-5	Multiple-System Diseases <ul style="list-style-type: none"> Inflammations and Infections Symptomatic Terms Diagnostic Terms Laboratory Tests and Procedures 	Lecture Cum Discussion Practice session	MCQ. Short Answer



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Internal Assessment: Medical Language-Theory (50 marks)

Item	Marks allotted	Weightage	Marks
Assignment			
Written Assignment- 1	20	20%	10
Presentation - 2	20	40%	20
Internal Examination			
Sessional Exam I	30 marks	40%	20
Sessional Exam II	30 marks		
Total	100 marks	100%	50

University Examination: Theory

S. No	Assessment	Marks
1.	Medical Language	100 marks
Grand Total		100 marks

Final Assessment: Medical Language Theory

S. No	Assessment	Marks
1.	Internal Assessment	50 Marks
2.	University Examination	100 Marks
Grand Total		150 Marks
1.	Internal Assessment	50 Marks
2.	University Examination	50 Marks
Grand Total		100 Marks



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Biostatistics & Research Methodology

Placement: Second Semester

Course/Subject Title	Theory		Experiential		Practical		Total	
	Credits	Hrs	Credits	Hrs	Credits	Hrs	Credits	Hrs
Biostatistics & Research Methodology	6	90	1	45	1	30	8	165

Learning Outcomes:

- Identify research areas
- Develop research protocol and data collection instrument
- Conduct research project
- Analyze the findings of the research

Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
I	T-10 E-10	Introduction to Research Methodology <ul style="list-style-type: none"> • Identifying research Problem • Review of Literature • Research Process • Research designs 	Lecture Cum Discussion Exercise	MCQ-short Answer, Essay
II	T-10 E-15	Study Designs <ul style="list-style-type: none"> • Descriptive Epidemiological Methods- Case series analysis and prevalence studies • Analytical epidemiological methods- Case-Control & Cohort studies • Clinical trials/ Interventional studies • Odds ratio & Relative risk Stratified Analysis 	Lecture Cum Discussion Exercise	MCQ-short Answer, Essay
III	T-10 E-5	Sampling <ul style="list-style-type: none"> • Random & non- random sampling, • Various methods of sampling, Simple random sampling, Stratified, Systematic, Cluster, Multistage, Sampling & Non sampling errors, • Methods of minimizing errors 	Lecture Cum Discussion Exercise	MCQ-short Answer, Essay
IV	T-10 E-5	Sample size determination <ul style="list-style-type: none"> • General concepts • - Sample size for estimating the means & proportion • Testing the difference in means and proportion of two groups 	Lecture Cum Discussion Exercise	MCQ-short Answer, Essay



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Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
V	T-10 E-5	Research Tools and Data Collection Methods <ul style="list-style-type: none"> Data collection methods & Instruments Research Ethics Validity & Reliability Pilot study Data collection Procedure 	Lecture Cum Discussion Exercise	MCQ-short Answer, Essay
VI	T-5 T-5	Introduction <ul style="list-style-type: none"> Introduction to Biostatistics Types of variables & scales of measurements, Measures of central tendency and dispersion, Rate, Ratio, Proportion, Incidence & Prevalence 	Lecture Cum Discussion Exercise	MCQ-short Answer, Essay
VII	T-10 T-5	Basic probability distribution & Sampling distributions <ul style="list-style-type: none"> Concept of probability distribution- Normal, Poisson & Binomial distribution Parameters & Applications- Concepts of sampling distribution -Standard Error & Confidence Interval Skewness & Kurtosis 	Lecture Cum Discussion Exercise	MCQ-short Answer, Essay
VIII	T-10 T-5	Tests of Significance <ul style="list-style-type: none"> Basics of Testing of Hypothesis- Null & Alternate Hypothesis Level of significance (Parametric) & power of test-p Value Tests of significance- test (Paired & Unpaired), Chi- Square test, Test of Proportion- One-way analysis of variance- Repeated measures of analysis of variance Test of significance (non-parametric), Mann-Whitney U test, Wilcoxon test, Kruskal- Wallis analysis of variance, Friedmann's analysis of variance 	Lecture Cum Discussion Exercise	MCQ-short Answer, Essay
IX	T-5 P-5	Correlation & Regression <ul style="list-style-type: none"> Simple correlation- Pearson's & Spearman's Testing the significance of correlation coefficient linear & multiple regression 	Lecture Cum Discussion Exercise	MCQ-short Answer, Essay



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X	T-5	Multivariate Analysis Concept of multivariate analysis - Introduction to logistic regression & survival analysis	Lecture Cum Discussion Exercise	MCQ-short Answer, Essay
	P-5			
	T-2 E-5	Reliability & Validity evaluation of diagnostic tests	Lecture Cum Discussion Exercise	MCQ-short Answer, Essay
XI	T-3	Format of Scientific document <ul style="list-style-type: none"> • Structure of research protocol • Structure of thesis/ research report- • Formats of reporting in scientific journals • Systematic review - Meta-analysis 	Lecture Cum Discussion Exercise	MCQ-short Answer, Essay
	P-5			

Internal Assessment: Biostatistics & Research Methodology (50 marks)

Item	Marks allotted	Weightage	Marks
Assignment			
Data collection tool Preparation	20 marks	20%	10
Proposal Presentation	20 marks	40%	20
Internal Examination			
Sessional Exam I	30 marks	40%	20
Sessional Exam II	30 marks		
Total	100 marks	100%	50

University Examination:

S.No	Assessment	Marks
1.	Biostatistics & Research Methodology	100 marks
Grand Total		100 marks

Final Assessment: Biostatistics & Research Methodology

S.No	Assessment	Marks
1.	Internal Assessment	50 Marks
2.	University Examination	100 Marks
Grand Total		150 Marks



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PHARMACOLOGY

Placement: First Semester

Course/Subject Title	Theory		Experiential		Practical		Total	
	Credits	Hrs	Credits	Hrs	Credits	Hrs	Credits	Hrs
Pharmacology	3	45	-	-	-	-	3	45

Learning Outcomes:

- Describe Pharmacodynamics and Pharmacokinetics
- Explain the pharmacology of drugs acting system wise
- Describe the symbols and drug nomenclature

Unit	Time (Hrs)	Content	Teaching Learning Activities	Assessment Methods
I	5	General Pharmacology <ul style="list-style-type: none">• Introduction• Route of Drug Administration• Pharmacokinetics• Pharmacodynamics• Drug Toxicity and Safety	Lecture Cum Discussion	MCQ, Short Answer, Essay
II	5	Autonomic nervous system, including skeletal muscle relaxants <ul style="list-style-type: none">• Introduction to ANS• Cholinergic drugs• Anticholinergic drugs• Neuromuscular blocking drugs• Adrenergic drugs• Adrenergic Receptor Antagonist	Lecture Cum Discussion	MCQ, Short Answer, Essay
III	5	Central Nervous System <ul style="list-style-type: none">• Sedatives and Hypnotics• Antiepileptic drugs• Local anesthetics• General anesthetics• Opioids• NSAIDs• Psychopharmacology	Lecture Cum Discussion	MCQ, Short Answer, Essay
IV	5	Cardiovascular System <ul style="list-style-type: none">• Antihypertensive• Antianginal drugs• Congestive cardiac failure• Digitalis & related cardiac glycosides	Lecture Cum Discussion	MCQ, Short Answer, Essay
V	5	Respiratory System <ul style="list-style-type: none">• Pharmacotherapy of cough• Pharmacotherapy of Bronchial asthma	Lecture Cum Discussion	MCQ, Short Answer, Essay



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Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
VI	5	GIT <ul style="list-style-type: none">• Peptic ulcer• Antiemetics• Laxatives and antidiarrheal• Hypolipidemics	Lecture Cum Discussion	MCQ, Short Answer, Essay
VII	5	Chemotherapy <ul style="list-style-type: none">• General aspects• Beta lactam antibiotics• Cotrimoxazole• Aminoglycosides• Tetracyclines• Macrolides• Quinolones• Antifungal agents• Antiviral drugs• Antitubercular drugs• Antileprotic drugs• Antimalarial drugs• Antiamoebic drugs• Anthelmintics• Anticancer drugs	Lecture Cum Discussion	MCQ, Short Answer, Essay
VIII	5	Hormones <ul style="list-style-type: none">• Corticosteroids• Antidiabetic drugs• Thyroid and antithyroid drugs	Lecture Cum Discussion	MCQ, Short Answer, Essay
IX	5	Special Topics <ul style="list-style-type: none">• Standard abbreviations and symbols used in prescription• Sources of drug information – Pharmacopeias, non-official references, MIMS, medical journals, FDA – product information• Drug nomenclature – Chemical, generic, official and trade name• Prescription writing	Lecture Cum Discussion	MCQ, Short Answer, Essay



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Internal Assessment: Pharmacology (50 marks)

Item	Marks allotted	Weightage	Marks
Assignment			
Written Assignment- 1		20%	10
Presentation - 2		40%	20
Internal Examination			
Sessional Exam I	30 marks	40%	20
Sessional Exam II	30 marks		
Total	100 marks	100%	50

Collegiate Examination:

S.No	Assessment	Marks
1.	Pharmacology	50 marks
Grand Total		50 marks

Final Assessment: Pharmacology

S.No	Assessment	Marks
1.	Internal Assessment	50 Marks
2.	University Exam - Duration 3 hours	50 Marks
Grand Total		100 Marks



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Third
Semester



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Health Care financing

Placement: Third Semester

Course/Subject Title	Theory		Experiential		Practical		Total	
	Credits	Hrs	Credits	Hrs	Credits	Hrs	Credits	Hrs
Quality Management In Health Services	8	120	-	-	1	30	9	150

Learning Outcomes

- To explain the basic concepts of accounts, finance and financial management
- To describe financial accounting and financial management principles
- To describe the hospital management accounting and health insurance

Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
I	T-10	<u>The Nature and purpose of Accounting.</u> <u>Accounting Concepts & Accounting records:</u> <ul style="list-style-type: none"> • What is accounting information? Who needs it? What they need or expect? What do accountants do? • Single Entry Book – keeping • Double Entry Book - keeping • What is an Account? Making entries. • Five types of Accounts (Income, Expense, Asset, Liability, Capital) Book – keeping rules • Accounting books/ledgers (Nominal, Purchase, Sales, Journal etc) • Dealing with cash, imprest system 	Lecture Cum Discussion Exercise	MCQ. Short Answer, Essay
II	T-10 P-5	<u>Preparation of various Financial Statements:</u> <ul style="list-style-type: none"> • Trial Balance • Receipts and Payments • Income and Expenditure Account • Balance Sheet 	Lecture Cum Discussion Exercise	MCQ. Short Answer, Essay
III	T-10	<u>Fixed assets and Depreciation:</u> <ul style="list-style-type: none"> • What are fixed assets and why are they different? • What is depreciation and why do we need it? • How do we calculate depreciation? (pros and cons of different methods) • Accounting entries for depreciation 	Lecture Cum Discussion Exercise	MCQ. Short Answer, Essay



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Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
IV	T-10 P-5	<u>Costing and Pricing:</u> <ul style="list-style-type: none"> Financial accounting Vs. Cost accounting Key terms: Direct/indirect, fixed/variable/semi-variable Analysing results: Standard/budgeted/actual Costing hospital services Taken action: controllable /uncontrollable Making decisions: Marginal/book/out –of pocket costs Reporting costs: Cost Centres, allocation and apportionment of costs Pricing methods and decisions. 	Lecture Cum Discussion Exercise	MCQ. Short Answer, Essay
V	T-10	<u>Inventory Accounting:</u> <ul style="list-style-type: none"> Inventory / stocks Valuation (FIFO, LIFO, WAC etc) Optimum balance and reorder levels 	Lecture Cum Discussion Exercise	MCQ. Short Answer, Essay
VI	T-10 P-5	<u>Analysis of Financial Statements:</u> <ul style="list-style-type: none"> Ratio analysis – meaning and purposes Ratios applicable to Non-profit making organizations 	Lecture Cum Discussion Exercise	MCQ. Short Answer, Essay
VII	T-10	<u>Financial Planning and Control:</u> <ul style="list-style-type: none"> Budgets and budgetary control 	Lecture Exercise	MCQ. Essay
VIII	T-10 P-5	<u>Use of Computers in Accounting:</u> <ul style="list-style-type: none"> Computerized ledger systems Spreadsheets & Excel based accounting 	Lecture Exercise	MCQ. Short Answer,
IX	T-10	<u>Accounting and Audit Procedures in Health Care Sector:</u> <ul style="list-style-type: none"> Accounting System in hospital Purpose of an audit and auditing principles What the auditor does? The audit report – “True and Fair View” Legal requirements: layout, audit and filing of accounts 	Lecture Cum Discussion Exercise	MCQ. Short Answer, Essay
X	T-10	<u>Health Insurance and Third Party Payers</u> <ul style="list-style-type: none"> Definition and history of Health Insurance Concepts in Health Insurance Issues in Health Insurance Effective Health Insurance Good & Bad in Health Insurance 	Lecture Cum Discussion Exercise	MCQ. Short Answer, Essay



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Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
		<ul style="list-style-type: none"> • Reasons for lack of coverage • Denial of claims • Contracts or Memorandums of Understanding 		
XI	T-10 P-10	<u>Health Insurance</u> <u>Functions of a health financing system</u> <ul style="list-style-type: none"> • What is health insurance? • History of health insurance <u>Values in health insurance</u> <ul style="list-style-type: none"> • Solidarity • Risk pooling / sharing • Equity Participation / empowerment <u>The health insurance framework</u> <ul style="list-style-type: none"> •Community •Providers •Organizer •Insurer • Health Insurance & Third Party Administrators • Insurance Regulatory Development Authority & its rol Billing & Health Insurance Billing <u>Premium</u> <ul style="list-style-type: none"> • Benefit package • Payments • Administration • Risk management • Monitoring the programme <u>Advantages of health insurance</u> <u>Problems with health insurance</u> <ul style="list-style-type: none"> • Adverse selection • Moral hazard • Cost escalation • Administrative costs • Fraud 	Lecture Cum Discussion Exercise	MCQ. Short Answer, Essay
XII	T-10	<u>Types of health insurance</u> <ul style="list-style-type: none"> • Social health insurance • Private health insurance • Community health insurance (CHI) 	Lecture Cum Discussion Exercise	MCQ. Short Answer, Essay



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	<ul style="list-style-type: none"> • Government-initiated health insurance schemes (GHI) • Differences in the four categories <u>Health Insurance in India</u> • Social Health insurance • Voluntary (commercial) health insurance • Daily hospitalization expenses – Royal Sundaram's Hospital Cash • Critical illness cover – ICICI Prudential's Crisis cover • Community health insurance (CHI) • Government-initiated health insurance schemes 		
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Internal Assessment: Health Care Financing (50 marks)

Item	Marks allotted	Weightage	Marks
Assignment			
Written Assignment- 1	20 marks	20%	10
Presentation - 2	20 marks	40%	20
Internal Examination			
Sessional Exam I	30 marks	40%	20
Sessional Exam II	30 marks		
Total	100 marks	100%	50

University Examination:

S.No	Assessment	Marks
1.	Health Care Financing	100 marks
Grand Total		100 marks

Final Assessment: Health care Financing

S.No	Assessment	Marks
1.	Internal Assessment	50 Marks
2.	University Examination	100 Marks
Grand Total		150 Marks



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Health & Bio informatics

Placement: Third Semester

Course/Subject Title	Theory		Experiential		Practical		Total	
	Credits	Hrs	Credits	Hrs	Credits	Hrs	Credits	Hrs
Health & Bio informatics	6	90	-	-	2	60	6	150

Learning Outcomes

- Identify and analyze the role of health care informatics in improving patient care and outcomes.
- Evaluate various health information systems and technologies used in health care settings.
- Apply health care informatics principles to optimize data collection, storage, retrieval, and analysis.
- Assess the legal, ethical, and security issues related to health care informatics.
- Utilize health care informatics tools and technologies to support clinical decision-making
- Understand the principles and applications of bioinformatics in biological research.
- Perform sequence alignment and analysis using bioinformatics tools.
- Analyze and interpret genomic and proteomic data using basic statistical techniques
- Retrieve and manage biological data from database & Visualize and present biological data effectively

Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
I	5	Introduction to Health Care Informatics <ul style="list-style-type: none"> • Overview of health care informatics • History and evolution of health care informatics • Health informatics workforce development • Future trends and directions in health care informatics 	Lecture cum discussion	MCQ Short answer, Essay
II	T-10 P-10	Health Information Systems Electronic Health Records (EHR) <ul style="list-style-type: none"> • EHR implementation and adoption • EHR functionalities and benefits • EHR data management and security <ul style="list-style-type: none"> • Benefits and challenges of EHR Health Information Exchange (HIE) <ul style="list-style-type: none"> • Interoperability and data sharing in healthcare • Standards and protocols for HIE • Health information exchange concepts and principles • HIE implementation challenges and solutions • Impact of HIE on healthcare coordination and 	Lecture cum discussion Practical assignment	MCQ Short answer, Essay



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Unit	Time (Hrs)	Content	Teaching/ Learning Activities	Assessment Methods
		continuity Clinical Decision Support Systems (CDSS) <ul style="list-style-type: none"> Clinical Decision Support Systems (CDSS) Applications of CDSS in healthcare <ul style="list-style-type: none"> Evaluating CDSS effectiveness 		
III	T-10 P-5	Health Data Management <ul style="list-style-type: none"> Data collection, storage, and retrieval Data standards and interoperability Health Data Standards and Interoperability SNOMED CT, LOINC, and other terminologies Health Level Seven International (HL7) standards Health Analytics and Data Visualization Introduction to data analytics in healthcare Techniques for data visualization 	Lecture cum discussion	MCQ Short answer, Essay
IV	T-5 P-5	Health Analytics & Business Intelligence <ul style="list-style-type: none"> Data analysis and visualization Predictive analytics in health care Population health management Data sources and data collection in healthcare Data mining and visualization techniques Quality improvement using data analytics 	Lecture cum discussion Practical assignment	MCQ Short answer, Essay
V	5	Teleconsultation <ul style="list-style-type: none"> Remote patient monitoring Mobile health technologies Telemedicine Telehealth technologies and applications Challenges and opportunities in telemedicine <ul style="list-style-type: none"> Legal and regulatory considerations in telemedicine 	Lecture cum discussion	MCQ Short answer, Essay
VI	T-8 P-5	Health Informatics in Clinical Practice <ul style="list-style-type: none"> Workflow analysis and process improvement Health informatics in nursing and pharmacy Health informatics in radiology and imaging Public Health Informatics <ul style="list-style-type: none"> Role of informatics in public health surveillance Disease outbreak management and informatics Consumer Health Informatics <ul style="list-style-type: none"> Health apps and wearables 	Lecture cum discussion Practical assignment	MCQ Short answer, Essay



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Unit	Time (Hrs)	Content	Teaching/ Learning Activities	Assessment Methods
		<ul style="list-style-type: none"> Personal health records (PHRs) and patient portals Health Informatics Implementation Challenges <ul style="list-style-type: none"> Change management and stakeholder engagement Evaluation and continuous improvement Health Informatics and Patient Engagement <ul style="list-style-type: none"> Patient portals and health applications Personal health records Patient engagement strategies		
VII	5	Legal, Ethical, and Regulatory Issues <ul style="list-style-type: none"> Health information privacy, confidentiality and security HIPAA and other regulations and compliance Security measures and risk management Ethical considerations in health care informatics Legal and Ethical Considerations in Health Informatics Informed consent and data governance Ethical issues in data analytics and research Cybersecurity in health care informatics 	Lecture cum discussion	MCQ Short answer, Essay
VIII	5	Emerging Trends in Health Care Informatics <ul style="list-style-type: none"> Artificial Intelligence (AI) and machine learning in health care Block chain technology in health care Precision medicine and genomics Internet of Things (IoT) and its impact on healthcare 	Lecture cum discussion	MCQ Short answer, Essay
IX	T-4	Introduction to Bioinformatics <ul style="list-style-type: none"> Definition and scope of bioinformatics Importance of bioinformatics in biological research Overview of bioinformatics databases and resources Bioinformatics tools and software	Lecture Cum discussion	MCQ Short answer, Essay
X	T-8 T-10	Sequence Analysis <ul style="list-style-type: none"> Introduction to sequence alignment Pairwise sequence alignment algorithms (e.g., Needleman-Wunsch, Smith-Waterman) Multiple sequence alignment Sequence motif analysis and identification DNA and protein sequence databases Sequence similarity and homology search tools Introduction to next-generation sequencing data analysis 	Lecture cum discussion Practical assignment	MCQ Short answer, Essay



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Unit	Time (Hrs)	Content	Teaching/ Learning Activities	Assessment Methods
XI	T-8 T-10	Genomics and Proteomics <ul style="list-style-type: none"> • Introduction to genomics and proteomics, gene expression data, Genome assembly • Comparative genomics and evolutionary analysis • Protein structure prediction and modeling • Pre-processing & normalization of gene expression data • Differential gene expression analysis • Gene set enrichment analysis (GSEA) Genome Annotation (7 hours) Basics of genome annotation Gene prediction algorithms Functional annotation of genes and proteins Genome browser tools and visualization	Lecture cum discussion Practical assignment	MCQ Short answer, Essay
XII	T-6 P-5	Statistical Analysis in Bioinformatics <ul style="list-style-type: none"> • Introduction to statistical analysis in bioinformatics • Hypothesis testing and p-values • Statistical methods for differential gene expression analysis • Introduction to machine learning in bioinformatics 	Lecture cum discussion Practical assignment	MCQ Short answer, Essay
XIII	T-6 P-5	Biological Databases and Data Retrieval <ul style="list-style-type: none"> • Introduction to biological databases (e.g., GenBank, UniProt) • Database search and retrieval techniques • Database management and data organization 	Lecture cum discussion Practical assignment	MCQ Short answer, Essay
XIV	T-10 P-5	Data Visualization in Bioinformatics <ul style="list-style-type: none"> • Principles of data visualization • Visualization techniques for biological data • Interactive visualization tools for bioinformatics 	Lecture cum discussion Practical assignment	MCQ Short answer, Essay



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Internal Assessment: Health & Bio informatics (50 marks)

Item	Marks allotted	Weightage	Marks
Assignment			
Written Assignment- 1	20 marks	20%	10
Presentation - 2	20 marks	40%	20
Internal Examination			
Sessional Exam I	30 marks	40%	20
Sessional Exam II	30 marks		
Total	100 marks	100%	50

University Examination:

S.No	Assessment	Marks
1.	Health & Bio informatics	100 marks
Grand Total		100 marks

Final Assessment: Health & Bio informatics

S.No	Assessment	Marks
1.	Internal Assessment	50 Marks
2.	University Examination	100 Marks
Grand Total		150 Marks



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Internal Assessment: Health & Bio Informatics (Practical -50 Marks)

Item	Marks allotted	Weightage	Marks
Assignment			
Assignment	20	20%	10
Project	20	40%	10
Internal Examination			
Sessional Exam I	30 marks	40%	40
Sessional Exam II	30 marks		
Total	100 marks	100%	50

University Examination- Practical: Health & Bio Informatics

S.No	Assessment	Marks
1.	Disease Classification Systems	50 marks
Grand Total		50 marks

Final Assessment Health & Bio Informatics -Practical

S.No	Assessment	Marks
1.	Internal Assessment	50 Marks
2.	University Examination	50 Marks
Grand Total		100 Marks



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Clinical workflow and Process redesigning

Placement: Third Semester

Course/Subject Title	Theory		Experiential		Practical		Total	
	Credits	Hrs	Credits	Hrs	Credits	Hrs	Credits	Hrs
Clinical workflow and Process redesigning	4	60	-	-	1	30	5	90

Learning Outcomes

- Understand the concepts and importance of clinical workflow and process redesign.
- Apply workflow analysis techniques to evaluate clinical processes.
- Create process maps to visualize and document clinical workflows.
- Identify bottlenecks, inefficiencies, and areas for improvement in clinical processes.
- Implement change management strategies to facilitate workflow redesign.
- Evaluate the role of technology in enhancing clinical workflow.
- Develop and implement a plan for clinical process redesign.

Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
I	T-6	Introduction to Clinical Workflow and Process Redesign <ul style="list-style-type: none"> • Overview of clinical workflow and its impact on healthcare delivery • Principles of process improvement and redesign • Ethical considerations in workflow redesign 	Lecture Cum Discussion Exercise	MCQ. Short Answer, Essay
II	T-5	Workflow Analysis Techniques <ul style="list-style-type: none"> • Workflow analysis methods and tools • Process mapping and value stream mapping • Time-motion studies and observation techniques • Data collection and analysis for workflow assessment 	Lecture Cum Discussion Exercise	MCQ. Short Answer, Essay
III	T-8	Identifying Inefficiencies and Bottlenecks <ul style="list-style-type: none"> • Identifying common bottlenecks and inefficiencies in clinical workflows • Analyzing root causes of workflow problems • Human factors and ergonomics in workflow redesign 	Lecture Cum Discussion Exercise	MCQ. Short Answer, Essay



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Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
IV	T-5	Change Management in Workflow Redesign <ul style="list-style-type: none"> Principles of change management in healthcare settings Stakeholder analysis and engagement Strategies for overcoming resistance to change Communication and training in workflow redesign 	Lecture Cum Discussion Exercise	MCQ. Short Answer, Essay
	T-5	Technology and Workflow Optimization <ul style="list-style-type: none"> Role of technology in clinical workflow optimization Electronic health records (EHR) and clinical decision support systems Mobile health technologies and their impact on workflow Integration of technology with clinical processes 	Lecture Cum Discussion Exercise	MCQ. Short Answer, Essay
	T-6 P-15	Implementation of Workflow Redesign <ul style="list-style-type: none"> Developing an action plan for clinical process redesign Pilot testing and evaluation of redesigned workflows Monitoring and sustaining workflow improvements Measuring outcomes and evaluating the impact of redesign efforts 	Lecture Cum Discussion Exercise	MCQ. Short Answer, Essay
	T-10 P-15	Lean and Six Sigma Methodologies <ul style="list-style-type: none"> Introduction to Lean and Six Sigma principles DMAIC (Define, Measure, Analyze, Improve, Control) framework Applying Lean and Six Sigma tools for process improvement 	Lecture Exercise	MCQ. Essay
	T-10	Change Management in Workflow Redesign <ul style="list-style-type: none"> Understanding change management principles and frameworks Strategies for engaging stakeholders and managing resistance to change Communication and training in workflow redesign initiatives 	Lecture Exercise	MCQ. Short Answer,
	T-5	Technology Integration in Workflow Redesign <ul style="list-style-type: none"> Role of technology in clinical workflow optimization Electronic health records (EHRs) and clinical decision support systems Impact of technology on patient safety and quality of care 	Lecture Cum Discussion Exercise	MCQ. Short Answer, Essay



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Internal Assessment: Clinical Workflow & Process Redesigning (50 marks)

Item	Marks allotted	Weightage	Marks
Assignment			
Written Assignment- 1	20 marks	20%	10
Presentation - 2	20 marks	40%	20
Internal Examination			
Sessional Exam I	30 marks	40%	20
Sessional Exam II	30 marks		
Total	100 marks	100%	50

University Examination:

S.No	Assessment	Marks
1.	Clinical Workflow & Process Redesigning	100 marks
Grand Total		100 marks

Final Assessment: Clinical Workflow & Process Redesigning

S.No	Assessment	Marks
1.	Internal Assessment	50 Marks
2.	University Examination	100 Marks
Grand Total		150 Marks



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Hospital Administration

Placement: Third Semester

Course/Subject Title	Theory		Experiential		Practical		Total	
	Credits	Hrs	Credits	Hrs	Credits	Hrs	Credits	Hrs
Hospital Administration	7	105	1	45	2	60	9	210

Learning Outcomes:

- Describe principles of management
- Explain organizational behavior
- Describe hospital administration and other services
- Maintain quality in health care
- Adapt Medical ethics

Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
I	T-5	Introduction to Management <ul style="list-style-type: none"> • Importance of Management • Definition of Management -Characteristic features of Management • Roles of Management-Role of a Manager • Levels of Management and their functions- • Process of Management • Managerial skills Management and Administration	Lecture Cum Discussion	MCQ, Short Answer, Essay
II	T-10	Principles of Organizational Management <ul style="list-style-type: none"> • Culture, Values and Mission • Organizational Structure • Management theories • Planning, coordination, Decision making and controlling, organization, • Hospital Organizational Structures – Government, Private and Not for Profit. 	Lecture Cum Discussion	MCQ, Short Answer, Essay
III	T-10	Organizational Behavior <ul style="list-style-type: none"> • Personal Growth and Development • Definition, characteristics, determinants, causes, Theories (Type, Trait, Intrapsychic, Social learning) Perception: Definition- Factors- Perceptual grouping and selectivity - Stimuli selection- Barriers - Honing perceptual skills Attitudes and values: Definition, Characteristics, Functions and Formation of Attitudes-Definition, types, formation of values- Values and behavior- Values and ethics- Values and attitudes	Lecture Cum Discussion	MCQ, Short Answer, Essay



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Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
		Learning: Definition:- Components –Determinants-Theories (classical, operant, cognitive, social learning)- Principles of reinforcement- Punishment-Learning curves- Learning and behavior		
IV	T-10 P-10	Managing People (Human Resources) <ul style="list-style-type: none"> • Overview – scope and functions of HR dept., HR planning • Recruitment and Appointment • Training and Development • Goal setting, rewards systems and motivation • Performance Appraisal • Promotion, internal transfers • Problems and Legal issues • Leadership Working in teams	Lecture Cum Discussion	MCQ, Short Answer, Essay
V	T-5 E-10	Hospital Administration <ul style="list-style-type: none"> •Key administrators and their functions, overview of medical and para-medical specialties, main service departments: •Overview of health services – government services: private & not for profit: primary, secondary & tertiary health care: types of hospital: community, super-specialty etc 	Lecture Cum Discussion	MCQ, Short Answer, Essay
VI	T-3	Clinical Services <ul style="list-style-type: none"> • Overview of clinical departments and services – OPD, In-patients, ICU, Surgical, • Emergency, Community/family Health, Paramedical & Rehabilitation • Types of doctors, their training, roles and responsibilities • The role & responsibilities of the HOD • Medical Audit • Medical Negligence & Litigation 	Lecture Cum Discussion	MCQ, Short Answer, Essay
VII	T-2	Nursing Services and Wards <ul style="list-style-type: none"> ○ Objectives of the nursing service ○ Nursing service organization, types of nurses, their training, qualifications and functions, other ward staff, personnel issues. • Ward management 	Lecture Cum Discussion	MCQ, Short Answer, Essay
VIII	T-5 E-5	Product-based services <ul style="list-style-type: none"> • Pharmacy purchasing and stores • Pharmacy dispensing • Prosthetics & Orthotics 	Lecture Cum Discussion	MCQ, Short Answer, Essay



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Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
		<p>Diagnostic Services (Radiology, Laboratories, Blood Bank etc.)</p> <ul style="list-style-type: none"> • Overview – main services and their functions, In-house services <p>Patient Services (non-medical)</p> <ul style="list-style-type: none"> • Reception, Welcome/Help Desk • Patient facilities, wheelchairs, Ambulances • Public Relations – objectives, functions, policies, different media, methodologies, networking • Managing Support Services • Overview of functions of all support services including Laundry, Catering, Cleaning, CSSD, Transport, Security, Materials (Purchase and Stores) etc. • Functions of GS Office 	Lecture Cum Discussion	MCQ, Short Answer, Essay
IX	T-5 E-10	<p>Hospital Infrastructure (Buildings and Plant)</p> <ul style="list-style-type: none"> • Civil Engineering – Planning and maintaining buildings, water & sewage • Electrical Engineering • Mechanical Engineering, Equipment Maintenance, Medical Gases, etc. • Biomedical Engineering • Corporate Governance & legal matters • Relationships with other institutions and organizations 	Lecture Cum Discussion	MCQ, Short Answer, Essay
x	T-5 E-10	<p>Healthcare Policies & Standards</p> <ul style="list-style-type: none"> • health law, regulations, accreditations standards, and certification requirements. • Compliance to organisational policy • Auditing methods and techniques • ICT systems in compliance with applicable laws, regulations, standards and requirements 	Lecture Cum Discussion	MCQ, Short Answer, Essay
XI	T-5 P-10	<p>Quality assurance program in the health system.</p> <ul style="list-style-type: none"> • Concepts of Quality of Care • Quality Improvement Approaches • Standards and Norms • Quality Improvement Tools 	Lecture Cum Discussion	MCQ, Short Answer, Essay
XII	T-10 P-10	<p>Quality Assessment and Quality Improvement</p> <ul style="list-style-type: none"> • Quality Assurance & Medical Care Evaluation 	Lecture Cum Discussion	MCQ, Short Answer, Essay



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Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
		<ul style="list-style-type: none"> • Utilization management • Peer Review • Utilization review processing & outcomes of Utilization management Risk management program [Organization & Operation International Standards Organization [ISO], Quality Council of India, & National Accreditation Board of Hospitals [NABH]		
XIII	T-15 P-10 E-10	<p>Fundamentals of medical ethics: Law & Ethics – Definition, Goal, Scope, Basic Principles</p> <p>Code of Conduct: History and Development - Various code of ethics in medical and Health Information Management practice: Atreya Anushasana, Charaka Samhita, Sushruta Samhita, Hippocratic Oath, International Code of Medical Ethics, Code of Ethics for Biomedical Research, and Code of Conduct for Health Information Professionals</p> <p>Ethical Issues in professional conduct of healthcare and health information professional: Malpractice & negligence, Irrational Use of drug, Autonomy of patient Vs Paternalism, Informed Consent, Confidentiality, Sophisticated drug and Technology, Research, Clinical trial, Human Experimentation, Organ Transplantation</p> <p>Ethical issues at the beginning and end of life: Genetics, Right to life, Sex Pre-selection, Female feticide & Infanticide, Care of terminally ill patient, Euthanasia, Quality of life</p> <p>Ethical Issues in social justice and equity in health: Right to health, Health policy, Distributive justice in health care</p> <p>Medico-legal aspects in healthcare practice: Medico-legal case - Definition, Types, handling Medico-legal case in hospital. Regulatory framework in Indian Context: Indian Penal Code, Consumer Protection Act.</p>	Lecture Cum Discussion	MCQ, Short Answer, Essay



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Unit	Time (Hrs)	Content	Teaching /Learning Activities	Assessment Methods
XIV	T-5 P-10	Disaster preparedness and management- <ul style="list-style-type: none"> • Fundamentals of emergency management, • Psychological impact management, • Resource management, • Preparedness and risk reduction, Key response functions (including public health, logistics and governance, recovery, rehabilitation and reconstruction), information management, incident command and institutional mechanisms	Lecture Cum Discussion	MCQ, Short Answer, Essay
XV	T-5 P-5	Hospital Statistics <ul style="list-style-type: none"> • Definition of hospital statistics and important Hospital Terms • Sources of Hospital Statistics –Registers, Medical Records and Daily Ward Census • Analysis of Hospital Services and Discharges □ Important Rates, Ratio and Percentages with Formula • Important Rates, Ratio and Percentages with Formula • Uses and Limitations of Hospital Statistics • Hospital Statistics Reporting 	Lecture Cum Discussion	MCQ, Short Answer, Essay
XVI	T-5 P-5	Vital Statistics <ul style="list-style-type: none"> • Definition and Uses of Vital statistics • Methods of Collection of Vital Statistics • Formulae for processing Vital Statistics: <ul style="list-style-type: none"> o Crude Rates o Specific Rate o Prevalence, Incidence, Morbidity, fertility rates o Mortality Rates – Crude Death Rate, Specific Death Rates with respect to age, sex etc. Cause-of-death Rates; Infant Mortality Rates; Neonatal Mortality Rates o Post-Neonatal Mortality Rate or Late Infant Mortality Rate 	Lecture Cum Discussion	MCQ, Short Answer, Essay



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Internal Assessment: Hospital Administration (50 marks)

Item	Marks allotted	Weightage	Marks
Assignment			
Written Assignment- 1	20	20%	10
Presentation - 2	20	40%	20
Internal Examination			
Sessional Exam I	30 marks	40%	20
Sessional Exam II	30 marks		
Total	100 marks	100%	50

University Examination:

S.No	Assessment	Marks
1.	Hospital Administration	100 marks
Grand Total		100 marks

Final Assessment: Hospital Administration

S.No	Assessment	Marks
1.	Internal Assessment	50 Marks
2.	University Examination	100 Marks
Grand Total		150 Marks



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M.Sc. Health Informatics
University Question Paper format

Marks : 100 Marks
Time : 3 hours

SECTION A

Marks 55

Q.1) Write Short Answers on any 4 out of 5

4 X 5 = 20 marks

- a.
- b.
- c.
- d.
- e.

Q2. Write Explanatory Notes on any 5 out of 6

5 X 7 = 35 marks

- a.
- b.
- c.
- d.
- e.
- f.

SECTION B

Marks 45

Q.3) Essay Questions Any 3 out of 4

3 X15 = 45 marks

- | | | |
|----|------|---------|
| a. | i. | 2 marks |
| | ii. | 5 marks |
| | iii. | 8 marks |
| b. | i. | 2 marks |
| | ii. | 5 marks |
| | iii. | 8 marks |
| c. | i. | 2 marks |
| | ii. | 5 marks |
| | iii. | 8 marks |
| d. | i. | 2 marks |
| | ii. | 5 marks |
| | iii. | 8 marks |



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