16BM307 MEDICAL INFORMATICS

Hours Per Week :

L	T	P	C
3	-	-	4

Total Hours :

L	T	P	WA/RA	SSH/HSH	CS	SA	S	BS
45	-	-	20	46	6	12	3	2

Course Description and Objectives:

This course provides an introduction of the issues related to the implementation of electronic health records and other medical and healthcare databases in patient care settings, and their effective use in managing and improving personal and public health. The objective course is to enable the student to understand the recent trends in bioinformation systems, Medical standards and storage of medical data.

Course Outcomes:

The student will be able to:

- describe how the healthcare information infrastructure is used to collect, process, maintain, exchange, and disseminate data.

- demonstrate familiarity with information systems that employ communication and computer technology to collect, maintain, access, evaluate, and interpret healthcare/ public health data.

- demonstrate understanding of the use of informatics methods and resources as strategic tools to improve healthcare delivery and public health.

- articulate the importance of collaboration among medical, public health, communication, and informatics specialists in the process of design, implementation, and evaluation of healthcare/public health programs.

- articulate legal and ethical principles fundamental to the use of information technology and resources in healthcare/public health settings.

SKILLS:

- ✓ *Develop data organizing techniques and tools.*
- ✓ *Organize and plan according to client requirement.*
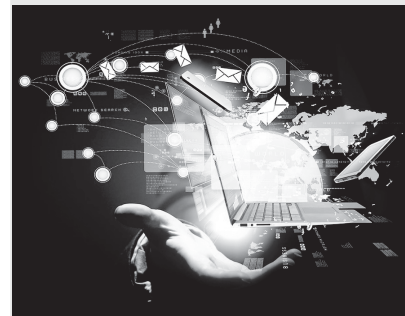
UNIT - 1   **L-9**

MEDICAL INFORMATICS: Introduction – Medical Informatics, Bioinformatics, Health Informatics, Structure of Medical Informatics, Functional capabilities of Hospital Information System, On-line services and Off line services, Dialogue with the computer.

UNIT - 2   **L-9**

MEDICAL STANDARDS: Evolution of Medical Standards, IEEE 11073, HL7, DICOM, IRMA, LOINC, HIPPA, Electronics Patient Records, Healthcare Standard Organizations, JCAHO (Joint Commission on Accreditation of Healthcare Organization), JCIA (Joint Commission International Accreditation), Evidence Based Medicine, Bioethics.

UNIT - 3   **L-9**

MEDICAL DATA STORAGE AND AUTOMATION: Representation of Data, Data modeling Techniques, Relational Hierarchical and network Approach, Normalization techniques for Data handling - Plug-in Data Acquisition and Control Boards, Data Acquisition using Serial Interface, Medical Data formats, Signal, Image and Video Formats, Medical Databases, Automation in clinical laboratories, Intelligent Laboratory Information System, PACS.

UNIT - 4   **L-9**

HEALTH INFORMATICS: Bioinformatics Databases, Bio-information technologies, Semantic web and Bioinformatics, Genome projects, Clinical informatics, Nursing informatics, Public health informatics, Education and Training.

UNIT - 5   **L-9**

RECENT TRENDS IN MEDICAL INFORMATICS: Medical Expert Systems, Virtual reality applications in medicine, Virtual Environment, Surgical simulation, Radiation therapy and planning, Telemedicine, virtual Hospitals, Smart Medical Homes, Personalized e-health services, Biometrics, GRID and Cloud Computing in Medicine.

TEXT BOOKS:

1.   R.D.Lele, "Computers in medicine progress in medical informatics", Tata McGraw Hill Publishing Ltd, 2005.

2.   Mohan Bansal, "Medical informatics", Tata McGraw Hill Publishing Ltd, 2003.

REFERENCE BOOKS:

1.   Orpita Bosu and Simminder Kaur Thukral, "Bioinformatics Databases, Tools and Algorithms", Oxford University press, 2007.

2.   Yi Ping Phoebe Chen, "Bioinformatics Technologies", Springer International Edition, New Delhi.