

BMPC2006 MEDICAL INFORMATICS (3-0-0)

Course Objectives:

The course in Medical Informatics aims to provide students with a comprehensive understanding of the intersection between healthcare and information technology. It seeks to develop critical knowledge of hospital management systems, telecommunication technologies, expert systems, and digital patient record management. The course will equip students with insights into the evolving landscape of medical informatics, exploring its historical context, current applications, and future potential. By integrating theoretical foundations with practical technological applications, the objective is to prepare students to understand and leverage advanced information systems in healthcare settings.

Module I (09 Hours)

Introduction: History, what is medical informatics, bioinformatics, contents of medical informatics, applications of medical informatics, progress & future of medical informatics, need for medical informatics education/training, medical informatics education courses/modules.

Module II (09 Hours)

Hospital Management & Information System (HMIS): Introduction, what is HMIS, Need for HMIS, Benefits of HMIS, Capabilities of HMIS, Development of HMIS, Steps in the development of HMIS, Functional area, Modules forming HMIS, Prerequisites for HMIS, Why HMIS Fails, Factors affecting maintenance & development of HMIS, Advantages of HMIS.

Module III (09 Hours)

Telecommunication Based Systems: Tele-Medicine, Need, Advantages, Technology-Materials and Methods, Internet Tele-Medicine, Applications. Tele-Surgery: Tele-surgery, Robotic surgery, Need for Tele-Surgery, Advantages, Applications.

Module IV (09 Hours)

Knowledge Based Expert Systems (ES): Introduction, Artificial Intelligence (AI), what is an Expert System (ES), Need for Expert System (ES), Knowledge Representation, Data Base Comparisons, Statistical Pattern Classification, Decision Analysis, Cognitive Models, Developmental Tools , Knowledge Engineering System (KES), Neural Networks and Advantages of Expert System (ES).

Module V (09 Hours)

Computer based Patient Records (CPR): Introduction, What is CPR, Need for CPR, Strength & Weakness of Hand Written Records, CPR & Clinical decisions, Ideal features of CPR, Components and Functionality of CPR, Development Tools, CPR in Radiology

Course Outcomes:

- CO1: Analyze the historical development and future potential of medical informatics, demonstrating comprehensive understanding of its core components, applications, and significance in modern healthcare.
- CO2: Evaluate Hospital Management and Information Systems (HMIS), critically assessing their development, functional modules, prerequisites, and potential challenges in implementation.

- CO3: Explore telecommunication-based healthcare technologies, including telemedicine and telesurgery, analyzing their technological foundations, advantages, and practical applications.
- CO4: Apply knowledge-based expert systems and artificial intelligence principles to medical decision-making, understanding knowledge representation, statistical pattern classification, and cognitive modeling techniques.
- CO5: Design and critically assess computer-based patient record systems, examining their components, functionality, strengths, and limitations in clinical decision-making and healthcare management.

Book:

- Medical Informatics- A Primer – Mohan Bansal – Tata McGraw Hill -200