COURSES FOR ADVANCED DIPLOMA IN HEALTHCARE INFORMATICS AND MANAGEMENT

Course code	Course name	L	T	P	CH	CR
HI 101	Introduction to Personal Computer	2	0	2	6	4
HI 102	Essentials of Information and Communication Technology	2	0	2	6	4
HI 103	Introduction to Database Design	2	0	2	6	4
HI 104	Introduction to Computer Networks	2	0	2	6	4
HI 201	Introduction to Healthcare Informatics	2	0	2	6	4
HI 202	Hospitals and Clinical Information Systems	2	0	2	6	4
HI 203	Legal, Ethical and Social Issues in Medical Informatics	3	0	0	3	3
HI 204	Accounting and Financial Management In Healthcare	2	1	0	3	3
HI 205	Medical and Electronic Health Records	2	0	2	6	4
HI 206	Clinical Decision Support Systems and Knowledge management	2	0	2	6	4
HI 301	Health Care Information System: Design, Implementation and Management	2	0	2	6	4
HI 302	Risk and Disaster Management in Healthcare	3	0	0	3	3
HI 303	Healthcare Technology: Assessment, Planning and Acquisition	2	1	0	3	3
HI 371	Major Project/ Internship	0	0	12	24	12

Detailed Syllabi:

HI 101 Introduction to Personal Computer (2 0 2 4 6)

Introduction to PC, Basics of Operating systems, PC Anatomy and Models, PC Mother Boards, Expansion Buses and CPU's, PC Maintenance and General Disassembly, Introduction to and Installing a Hard Disk, PC Memory, Video Adapters and Displays, PC Power Supplies and Protection, Key Board, Mouse, Printers, Configuring Circuit Boards, Modems and Serial Interfaces,

CD-ROM, SCSI Boards and Devices, Note Book / Laptop Computers, PC Component Market Survey, Upgrading an Old Computer, PC Assembling. Programming basics, Introduction to programming languages.

Text Books:

1. Fundamentals of Information Technology, Alexis Leon and Mathews Leon, Leon Techworld Pub, 1999
2. Fundamentals of Computers, Rajaraman, V., Prentice Hall India, 1999
3. Basic Computer programming, V.K. Jain, Pustak Mahal, 2004

HI 102 Essentials of Information and Communication Technology (2 0 2 4 6)

Basic Information Technology concept, Impact of ICT on society and healthcare, Computer systems (software and hardware), Introduction to Information systems; Concept of analog and digital signals, Channel capacity, Transmission impairments(attenuation, dispersion etc), Concept of signal-to-noise ratio, Encoding/ Decoding techniques, Transmission media- twisted pair, microwave, coaxial cable, optical fibre and satellite), A/D and D/A conversion, Concept of modulation and demodulation, Communication techniques- circuit switching, packet switching and message switching and their advantages and disadvantages.

Text Books:

1. Computer Organization and Architecture, William Stallings, Pearson, 2010
2. Electrical Communication Systems, George Kennedy, Tata McGraw Hill, 2011
3. Data Communication and Networking, Forouzan, Tata McGraw Hill, 2006

HI 103 Introduction to Database design (2 0 2 4 6)

Introduction, fundamentals of database management and organization, design and implementation of database application, management of large bodies of data, data organization in the abstract data structure, relational languages and how they are used to provide the interface for DBMS, Introduction to data mining algorithms, data mining applications i.e. data warehousing.

Text Books:

1. Seven Databases in Seven Weeks: A Guide to Modern Databases and the NoSQL Movement, Eric Redmond and Jim R. Wilson, Pragmatic Bookshelf, 2012
2. Database Management Systems, Raghu Ramakrishnan and Johannes Gehrke, McGraw Hill Education Asia, 2007, 3/e

HI 104 Introduction to Computer Networks (2 0 2 4 6)

Introduction to Networking, Basic Network Media, Structured cabling, Understanding Network Architecture, Network Operating Systems, Network Standards - OSI Reference Model, Network Standards - IEEE 802.x Project Model, Network Protocols, Elements of Network Connectivity, Designing and Installing a Network, Network Security, Printing on a Network, Administering Change in Network, Troubleshooting a Network.

Text Books:

1. Computer Networks, Andrew S. Tanenbaum, Pearson Education, 2002
2. Computer Networks and Internets, Douglas E. Comer, 2008, (5/e)

HI 201 Introduction to Healthcare Informatics (2 0 2 4 6)

Overview of Information Systems, Introduction, Nolan's Growth Model, Stages of Human Activity in Health Care, Information Processing, Computer Applications, Information Systems Models, Cascade Model, Business Model, Modeling Clinical Practice, PHS (Public Health Surveillance), Reference Models, IRD (Information Requirement Determination).Creation of documents, Diagnostics, Patient questionnaires, Treatment and Rehabilitation, Pharmaceuticals and Telemedicine.

Text Books:

1. Health Care Informatics: An Interdisciplinary Approach, S. P. Englebardt and R.Nelson, Mosby, 2002.

2. Medical Informatics: Computer Applications in Health Care and Biomedicine, Edward H. Shortliffe, 2000, (2/e).

HI 202 Hospitals and Clinical Information Systems (2 0 2 4 6)

Introduction and orientation, History of health information systems, specialization, departments, businesses, and silos. 21st Century national policy and framework; emergence of interoperable EHRs, Contemporary national policy: latest national strategic plan through 2015 and beyond (Macro, micro, personal), The Future: Goals, Visions, Possibilities, Consequences, Conclusions, integration, interpretation, synthesis, & hypothesis

Text Books:

1. Hospital Administration, Francis CM & Mario C de Souza, Jaypee Brothers, N. Delhi, 2004, (3/e)

2. Management of Hospital (4 Vols), S.L Goel & R. Kumar, Deep & Deep Publications Pvt. Ltd., 2004

HI 203 Legal, Ethical and Social issues in Medical informatics (3 0 0 3 3)

Introduction to the internet and healthcare; online medical consultations: legal, ethical and social perspectives, applied ethics and ICT system in healthcare, trust and clinical information systems, values of an electronic social record, responsibility in healthcare information system, clinical safety and quality management in healthcare information system, privacy and data protection issues regarding electronic health information system, prospect of thought communication.

Text Books:

1. The Book of Standard Legal Business Agreements, Contracts and Forms for Computer Software Programming, IT, and Web Site Design & Development, Platinum Millennium Publishing, 2010

2. Hospital Administration, Francis CM & Mario Ode Sonza, Jaypee Bros, New Delhi, 2004

3. Ethical, Legal and Social Issues in Medical Informatics, Penny Duquenoy, Carlisle George and Kai Kimppa, Medical Information Science Reference (an imprint of IGI global), 2008

HI 204 Accounting and Financial Management in Healthcare (2 1 0 3 3)

Financial Management – an overview, nature, scope, functions, goals, sources of finance-an overview. Fundamentals of valuation concepts- i) Time value of money and ii) Risk & Return-trade off. Working Capital Management including Cash Management, Receivables management and inventory Management Investment decisions-- Capital Budgeting- NPV, IRR, PI, ARR. Cost of Capital-overall vs. specific cost of capital Risk Analysis –nature of risk, conventional techniques of risk analysis. Dividend decisions**,** dividend theory, dividend policy. Long-term financing- issue of shares, debentures, other modes of financing. Financial Accounting- Nature & scope, Accounting principles, Journal, Ledger & Trial Balance, Preparation of Final Accounts & Balance Sheet, Receipts & Payments Account, Income & Expenditure Account. Cost Accounting- Nature & scope, Cost classification & their concepts, Cost control & Cost reduction. Management Accounting-- Nature & scope, Cost-Volume-Profit (CVP) Analysis, Cash Flow Analysis, Fund Flow Analysis, Ratio Analysis, Budgeting & Budgetary control.

Text Books:

1. Financial Management of Health Care Organizations: An Introduction to Fundamental Tools, Concepts, and Applications, William N. Zelman, Michael J. McCue, Alan R. Millikan, Blackwell Publishers, 1998
2. Fundamentals of financial management, Bruce R.M.W. John, PHI, 1995
3. Principles of Management Accounting, N. K. Agarwal, Asian Books, 2010

HI 205 Medical and Electronic Health Records Management (2 0 2 4 6)

Records Management: Registers, Forms, Meaning and importance –Principles of record keeping – Merits and limitation – Latest trends in record maintenance – Electronic forms of records maintenance, Hospital Records: Meaning – Functions – Importance of medical records to patients, Doctors, Hospitals, Public health, Press, LIC, Police – Court of Law, Educations and Research. Hospital Records: Types – Out – Patient record, Causality Emergency, Surgery, Obstetrics and gynecology, pediatrics, investigation and diagnosis – Hospital Statistics – Evaluation of Medical Care (Medical, Nursing, Pharmacy etc Audits). Records organization and Management : Classification of records – Bases for classification – indexing and filling of records – Problems associated with medical records – International classification of Disease (ICD) and DRG – (Principles and Uses) (Diagnostic Related Groups). Medical Registers: Meaning – Types – Purpose - Advantages – Principles of designing records – Registers in various departments - Common issues. Medical forms and Reports: Meaning – Types and significance – Principles of designing – Statutory registers and reports to be maintained – specimens.

Text Books:

1. Medical Records: Organization & Management, Mogli J D., Jay Kay Books, N.Delhi, 2006
2. Managing Health Service: Concepts & Practices, Maclennan and Petty, Harris M G & Assoc, 2003
3. Encyclopaedia of Quality Management in Hospitals & Health Care Administration, VolKelly D. L., Pentagon Press: Chicago, 2006

HI 206 Clinical Decision Support Systems and Knowledge Management (2 0 2 4 6)

Introduction, Description of current uses of medical decision making and decision support systems in healthcare, understand the benefits and limitations of medical decision making techniques, use of various decision making and analytic models to solve both structured and unstructured problems,

understand the basic features, benefits and limitations of machine learning and intelligent decision support methods in healthcare environment, understand the role of performance measurement in guiding decision support systems (DSS) deployment, develop a model for a DSS prototype to address a healthcare problem.

Text Books:

1. Clinical Decision Support Systems: Theory and Practice, Eta S Berner, Springer, 1998
2. Clinical Decision Support System: An Effective Pathway to Reduce Medical Errors and Improve Patient Safety, Chiang S. Jao and Daniel B. Hier, InTech, 2010

HI 301 Healthcare Information System: Design, Implementation and Management (3 0 1 4 5)

Introduction, understand the academic discipline of healthcare informatics, role of healthcare informatics in clinical healthcare applications, understand how medical data including clinical, administrative and financial data is used in healthcare information, understand the nature of medical knowledge and decision making and the role of decision support systems and knowledge-based systems, understand how current and emerging information delivery methods including web-based data bases and decision support systems, enterprise information systems and regional health information organizations can be used to enhance patient outcomes, sensitiveness to issues like privacy, ethics and compliance in the collection, distribution and use of medical information especially patient records, evaluation of current informatics software and systems used for clinical and professional support, understanding of integration of research, clinical data and theory in improving patient outcomes.

Text Books:

1. Managing Health Care Information Systems, Karen Wager, Frances Lee and John Glaser, Jossy-bass, 2005
2. Health Informatics: A Socio-Technical Perspective, S. Wheton, Oxford Univ. Press, 2005
3. Analysis, Design and Implementation of Information System, Locus, McGraw-Hill, 1985

HI 302 Risk and Disaster Management in Healthcare (2 1 0 4 5)

Basics of disaster management and Mass casualties, Components of disaster plan: pre-hospital and hospital, Disaster alertness in Hospital, Disaster management planning and implementation, Severity of illness amongst disaster victims and risk assessment. Policies & procedures for general safety, fire safety procedure for evacuation, disaster plan and crisis management.

Text Books:

1. Managing a modern hospital, Srinivasan A V, Response Books, New Delhi, 2002
2. A handbook on Hospital Administration, Sharma K. R, Sharma Yashpal, Durga Printers, Jammu, 2003

HI 303 Health Care Technology: Assessment, Planning and Acquisition (2 0 2 4 6)

Survey of electronic devices used in hospitals, healthcare technology overview, medical devices and systems, convergence of medical devices and information technology, Imaging types, physics and safety of Ultrasound, EEG/ECG/EMG, Xray/CT/Flouroscope, MRI/NMR, PET. Radiation Therapy (Gamma knife, Linear accelerator), Information Systems (eg PACS), Laser scalpels, Anesthesiology, Dialysis, Heart-lung machines, Electromagnetic interference.

Technology planning and policy, technology replacement planning, Net Present Value Analysis, Technology Acquisition and Deployment, Compliance with Regulations and Standards, Compliance with Regulations and Standards, Patient safety, Training, Maintenance, Clinical engineering, Computerized Medical Equipment Mgt Systems, Global Health Technology.

Text Books:

1. Healthcare Information Management Systems: Cases, Strategies, and Solutions, Marion Ball, Charlotte Weaver and Joan Keiel, Springer, 2010
2. Healthcare Services in Hospitals, Chandra Ballabh, Alfa Publications, 2007

HI 371 Project/Internship (0 0 12 12 24)

Students those who successfully complete semester V will undergo ‘on the job training’ at reputed healthcare organizations. They will be required to prepare a project report/dissertation during their internship/on the job training and submit the same to the department and on the basis of the report, viva voce will be conducted in the department. The supervisor(s) at the place of training will award marks out of 60% of the total marks and a panel of departmental experts will award marks out of the remaining 40% on the basis of viva voce. Those who successfully complete their viva voce will be awarded the diploma provided they complete all other requirements.