

**In the Name of God**



**Tehran University of Medical Sciences**

**School of Nursing and Midwifery**

**Medical Surgical Nursing and Basic Sciences Department**

**General specifications, plans and headlines of MS program in**

**Nursing Informatics (MSc Degree)**

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**Final revision for Deputy of chancellor**

**2020**

## **Section I:**

### **Title: Nursing Informatics**

#### **Degree: MSc**

**Introduction** (not more than 100 words including general comments on the field and its developments, advancements and history)

Nursing is already a discipline and informatics a specialty within the discipline. The rapid adoption of information technology systems in health care organizations has created a tremendous opportunity for informatics nurse specialists in a wide range of roles. Nursing informatics brings about learning opportunities for an effective use of information technology in nursing duties to improve clinical nursing care. NI<sup>1</sup> curriculum (1987) and the first NI Master Specialty were offered in 1988; followed by identifying competencies (1998), the first NI summer institute was founded at Maryland University in 1999. There were 500 Nursing Informatics graduates with master degrees at Maryland University from 1998-2010. NI is offered in many universities (mostly in USA) now.

**Definition** (the main subject of study and services provided by the graduates)

Nursing Informatics is the integration of nursing science, computer science, and information science. Nursing Informatics supports nurses, patients, service recipients, communities, stakeholders, and treatment teams in decision-making to facilitate the achievement of desired outcomes through the use of information structures and processes and information technology. The graduates will be able to carry out evidence-based practice through computer-based health care information systems to improve clinical nursing care. Also graduates will be involved with consumer health informatics, design of educational materials or apps for wellness and disease tracking.

**The Aim of the Course** (including its vision and mission)

The main objective of the program is to acquire new perspectives on the use of knowledge and information in nursing practice. The students will attain informatics knowledge together with skills in performing the roles of informatics nurse specialists. In future, they will become a contributing member of the nursing informatics community at local, national and international levels.

**Vision:** The School of Nursing and Midwifery, Tehran University of Medical Sciences (TUMS), will offer one of the leading academic programs in nursing informatics and will conduct education and research focused on providing informatics solutions to optimize nursing care

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<sup>1</sup> -Nursing Informatics

outcomes. TUMS will be recognized for leadership and excellence in education, health information technology policy, and nursing informatics applications at national and international levels.

**Mission:** The mission of the course is enhancing nurses' computer skills, Informatics Knowledge and Informatics skills as well as nursing informatics competencies promoting nursing care quality with the integration of information technology tools in all aspects of nursing profession.

**General Competencies** (including communicative, interviewing, educational, writing, reporting, critical thinking, problem solving, managerial ones as well as professionalism)

- Development of Communication
- Professional commitment
- Informatics capacity use
- Partnership and teamwork
- Remote Services
- Social justice
- Improved decision-making process
- Interdisciplinary perspective
- Evidence-based nursing
- Project Management
- Creativity and Innovation
- Reporting, evaluation and reform
- Application of theory to practice
- Educational improvement
- Community Research and problem solving strategies
- Information management (collection, organization and retrieval)
- Effective Leadership
- The security, privacy and the rights of patients
- Maintaining human contact with the patient while using technology
- Induction of new paradigm in nursing environment

### **Specific Competencies and Skills (Special Qualifications)**

In this program, students are guided to provide effective services in the field of education, management, research and clinical practice implementing information technology by learning NI competencies as follows:

#### **1. Computer skills:** Familiarity with and ability to use computer in the following areas

- Informatics tools for the design of nursing care plan and essential applications in nursing diagnosis, interventions and outcomes
- Telecommunications, and the Internet
- Securing nursing computer systems
- Databases and resources related to nursing care
- The application of nursing information management tools for patient education
- Benefiting from remote patient care and monitoring systems
- Using networks for communication, portable electronic systems

- Searching and retrieving patient demographic information
- Entering patient structured data

**2- Informatics Knowledge:** Acquiring knowledge and shaping the attitudes of nursing informatics in the following areas

- Diagnosis of data importance in the nursing care
- Recognition of the limitations of computer design and capacity
- Recognition of the growing acceptance of the use of computers in nursing care
- Recognition of the impossibility of doing some human activities by computers
- Searching for new resources for ethical consideration in nursing decision-making
- Identification of the client's rights in computer information management
- Appreciation of nurses' involvement in the design of nursing care systems  
Selection, implementation and evaluation systems
- Implementation of Information Technology for higher care quality and patient-nurse communication.
- Description of the present manual systems and applications
- Interaction with electronic communication networks
- Convincing nurses that use of computers in nursing requires no programming skills mastery
- Identification of human-computer interaction to enhance care quality
- Retrieving information and literatures for EBN and ethical use

**3. Informatics skills:** Developing the use of informatics tools in the following areas

- Evaluation tools for the quality of health information on the web
- Making use of informatics tools and database obtained through knowledge-based decisions to support patients
- Encouraging the other nurses in contributing to the use of information technology tools in work
- Participating in the selection, design, implementation and nursing systems evaluation process
- Supporting system users, including the clients, nurses and treatment groups
- Correcting some flaws in the nursing care systems
- Recommendation new and useful nursing clinical systems

### **The Terms and Conditions of Admission to the Course**

- Prospective Students with a BSc in Nursing or any other Health Related Programs with some Nursing background can apply for a direct entry into this MSc program.
- Prospective Students with a MSc in different fields of Nursing or any other Health Related Programs with some Nursing background can also apply for an entry into this MSc program.
- Applicants must be mentally and physically healthy

### **Educational Strategies, Methods and Techniques**

- Educational Strategies: Task-based learning; blended-learning; teacher-centered and student-centered learning; attendance virtual learning; problem-based learning; professional-competency-based learning, and evidence-based learning.
- Methods and Techniques: lecture, question & answer, video clip; journal club; Case presentation; Discussion in small groups, Student seminars and conferences, visits information technology websites; clinical practice in health care fields and nursing.

**Student Assessment**

- Written assessment [multiple choice questions (MCQ), essay (restricted & extended answer)]; oral assessment (unstructured and structured oral exams); interactive computer test; Practical assessment (projects, Portfolios, scenarios and Logbooks).

**Number and Type of Credits and Tables of the Courses (including Core, Management and Informatics Courses)**

Total courses: 32

- Core courses (5 credits)
- Management courses (4 credits)
- Informatics courses (23 credits)

Up to 9 credits may be waived if the students have previously taken courses the faculty deems to be equivalent. Work experience in an informatics position also may be included, based on the faculty decision.

Core courses (may be taken in any order)

Lesson code	Lesson name	credits	hours			Pre or co-requisite
			Theory	Practice	sum	
01	Medical Information Systems	1	9	17	26	
02	Research Methodology for Evidence Based Practice	2	34		34	
03	Biostatistics for Evidence Based Practice	2	34		34	
Total Core courses credits: 5						

Management courses may be taken in any sequence:

Lesson code	Lesson name	credits	hours			Pre or co-requisite
			Theory	Practice	sum	
04	Entrepreneurship Management in Nursing	2	34		34	

05	Nursing management and leadership	2	34		34	
Total Management courses credits: 4						

Informatics courses

Lesson code	Lesson name	credits	hours			Pre or co-requisite
			Theory	Practice	sum	
06	Fundamentals of Nursing Informatics	1	17		17	
07	Nursing Informatics Foundational Concepts	1	17		17	
08	Technology Solutions for Generating Knowledge in Nursing Care	2	34		34	06
09	Information Management Systems in nursing	1	17		17	
010	Advanced Nursing Informatics systems	2	17	34	51	06, 09
011	Quality Improvement and Patient Safety	2	34		34	
012	Nursing Database Systems: Analysis, Design and management	2	17	34	51	010, 011
013	Project Management for Healthcare Information Technology	2	34		34	
014	Ethical and Legal Aspects of Health Information Technology	1	17		17	
015	Electronic Education and eLearning	2	34		34	
016	Practicum in Nursing Informatics	3		102	102	012, 013
	Thesis*	4				

**\*MSc Thesis proposal:**

The thesis proposal explores the rationale for the proposed research and outlines its basic components. The proposal is submitted to the department’s research committee members (consisting of a dissertation advisor, department’s head, and department education and research representatives) for final evaluation and approval.

**Thesis Defense:**

The student and the thesis committee are required to comply with the School of Nursing and Midwifery guidelines with regard to preparation of the thesis and meeting deadlines for graduation. During the viva, the jury committee will thoroughly examine the student’s knowledge in the content area of the research.

**Flexible learning from anywhere:**

- This Nursing Informatics program can be completed entirely online.
- Your advisor will develop an individualized plan of study that fits your schedule.
- Advisors can connect with you via email, telephone, skype, or in person.
- For the required practicum, you and your practicum instructor will arrange a mutually agreeable site in a location convenient to you and confirm the selected site with your advisor and school of nursing and midwifery, TUMS.

**Ethical issues**

The graduates should,

- Observe the Patient's Bill of Rights\* when working with the patients.
- Strictly observe Biosafety and Patient Safety Rules\* concerning the patients, personnel and workplace.
- Observe the Rulebook for Dress Code\*.
- Carefully preserve resources and equipment.
- Truly respect faculty members, the staff, classmates and other students and work for creating an intimate and respectful atmosphere.
- Observe social and professional ethical considerations\* in criticism.

\* Will be set out by the Educational Departments and will be available to the students.

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## Section II

**Title of the Course:** Medical Information systems

**Code of the course:** 01

**Number of Credits:** 1

**Type of the course:** Core courses

**Prerequisite:** -

**Principal objective(s) of the course:** The aim of this course is to improve students' knowledge and insight to identify the components of the Internet and Healthcare Information Dissemination and systems.

**Course description:** This course provides up-to-date knowledge and offers broader information about diseases and nursing care. The integration of medical sciences, information and technology, and communication development skills can enhance access to the latest research findings across the world, and contribute to improve the quality of health care. In this course, students review the concepts of Healthcare Information Dissemination and infrastructures, challenges, and general software applications. Moreover, information retrieving skills such as search in e-resources, digital libraries, nursing and medical databases, and search engines along with informative websites are explored.

**Main topics: 26 hours**

### **Theory 0.5 units (9 hours)**

- The basics and concepts of Healthcare Information Systems
- Infrastructures, applications and challenges
- Internet and facilities
- The key points of general search on the Web
- The information retrieving models

### **Practice 1 unit (17 hours)**

- Working with search engines, Google, operators and services
- Using and managing communication tools over the Internet
- An Introduction to medical & nursing databases
- Digital library, Journals, books
- Pubmed search
- Medical Subject Headings (MeSH)
- An Introduction to useful websites

**Principal reference(s):**



1. Hebda T, Czar P. Handbook of informatics for nurses and health care professionals: Pearson Higher latest edition.
2. Self-learning websites ICDL; and Information Retrieving Skills articles and books

**Student assessment practices:** 50% is assigned to practical class assignments - 50% is assigned to final exam

**Title of the Course:** Research Methodology for Evidence Based Practice

**Code of the course:** 02

**Number of Credits:** 2

**Type of the course:** Core courses

**Prerequisite:** -

**Principal objective(s) of the course:** This course focuses on the essentials of the research process to facilitate students' ability to knowledgeably and effectively find, appraise, and apply scientific findings to nursing practice.

**Course description:** Students will be familiar with principles, concepts and methods of research in the nursing sciences, and accessing credible sources using a systematic approach, evaluating the quality of research findings, discussing methods of translation, integrating nursing knowledge into nursing practice, and evaluating outcomes.

1. Accessing research findings relevant to clinical practice through advanced search methods.
2. Appraising the quality of research evidence specific to the treatment and management of health care and nursing care.
3. Analyzing evidence summaries regarded as foundation for clinical practice guidelines.
4. Describing methods of translating and integrating scientific evidence into health care settings.
5. Examining the endpoints derived from integration of scientific findings into practice.

**Main topics: 34 hours**

**Theory 2 units (34 hours)**

- An overview of Research Methodology
- Introduction to research (history, definitions, types of quantitative research, subject selection)
- The assumption of theoretical framework, and a review of the studies and resources
- Objectives, questions, assumptions, and limitations of the study
- Methods and materials involved (population, sample and sampling methods, the study of variables and measures, data collection, tool validation and reliability, findings, data sources, statistical methods and information analysis, ethics in research)
- Conclusions and recommendations making use of findings and future research
- Learning how to prepare a research proposal
- Essentials of research critiques
- Making use of information technology in nursing informatics research
- Inferring, interpreting, and drawing conclusion out of the analyzed data

**Principal reference(s):**

1. Schneider Z, Whitehead D, LoBiondo-Wood G, Faan PR, Haber J, Faan PR. Nursing and midwifery research: Methods and appraisal for evidence based practice: Elsevier; 2016.
2. Grove SK, Mohnkern SM, Burns NA. Study guide for the practice of nursing research: Appraisal, synthesis, and generation of evidence: Saunders Elsevier; 2009.

3. Polit DF, Beck CT. Essentials of nursing research: Appraising evidence for nursing practice: Lippincott Williams & Wilkins; 2009.
4. Khoubati K, Dwivedi YK, Srivastava A, Lal B. Handbook of research on advances in health informatics and electronic healthcare applications: global adoption and impact of information communication technologies, IGI Global; 2009.
5. Lazakidou AA, Siassiakos KM. Handbook of research on distributed medical informatics and e-health: IGI Global; 2008.

**Student assessment practices:**

- Assessing the activities of students in class
- Assignments, seminars, individual and group activities

**Title of the Course:** Biostatistics for Evidence Based Practice

**Code of the course:** 03

**Number of Credits:** 2

**Type of the course:** Core courses

**Prerequisite:** -

**Principal objective(s) of the course:** The focus of this course is to introduce biostatistics in order to be applied to nursing and evidence-based practice. Emphasis is placed on the interpretation and appraisal of data analyses for selecting and using the best evidence to make practical conclusions about empirical data.

**Course description:** This course enables students to

1. Demonstrate how concepts of biostatistics are used in the literature, nursing research and evidence-based practice.
2. Select appropriate statistical methods in different situations of evidence-based practice.
3. Interpret results of data analysis and statistical tables in a variety of contexts.
4. Appraise the accuracy of data analyses in relation to the findings in selected research and quality improvement science articles.
5. Distinguish between statistical and clinical significance.

**Main topics: 34 hours**

**Theory 2 units (34 hours)**

- An overview of measurement scales
- Scale distribution of descriptive statistics
- Indicating the sample size
- An introduction to Type I and II errors and P Value
- Definitions and basic concepts: variable and dispersion, index of central tendency, measures of dispersion, measures of distribution, and accuracy
- An introduction to statistical analysis through SPSS Application
- Estimating and evaluating the hypothesis
- Overall comparison of the average, variance, and sample
- Estimating the proportions and evaluating the hypothesis
- Linear regression, analyzing one-way and two-way variances
- Graphs: histograms line and scatter charts

**Principal reference(s):**

- 1-Munro B . Statistical Method for Health Care Research, 7th: Lippincott Williams & Wilkins.2013.
- 2-Polit DF, Beck CT. Essentials of nursing research: appraising evidence for nursing practice. 7th ed. Philadelphia: Wolters Kluwer Lippincott Williams & Wilkins; 2010.Last Ed.

**Student assessment practices:**

- Class quiz given in the middle and end of the term
- Assessing the activities of students in the class
- Assignments, seminars, individual and group activities

## **Title of the Course: Entrepreneurship Management in Nursing**

**Code of the course:** 04

**Number of Credits:** 2

**Type of the course:** Management courses

**Prerequisite:** -

**Principal objective(s) of the course:** This course defines healthcare entrepreneurship from the perspective of nursing informatics, digital health, health care providers, and managers of health services. It will help you understand why digital technologies are at the forefront of entrepreneurship and give you familiarity with key characteristics of informatics and digital entrepreneurship in nursing profession care delivery.

**Course description:** Course modules cover the changing nature of careers, how to look for and create new products and innovation using the informatics tools and digital technologies. How the internet affects entrepreneurial competition including network effects and platform technologies, using the internet to find resources and team members to build a business, plus the role of growth and scaling. You will learn through a mix of useful assessment, strategy and theory, designed to help you become a digital entrepreneur manager in different aspects of nursing job utilizing rapidly changing technology.

**Main topics: 34 hours**

**Theory 2 units (34 hours)**

- The definition and concepts of health entrepreneurship
- The process of innovation and industry disruption
- Determining the elements of online innovation Articulate the nature of digital value creation and R&D
- Designing a business plan
- Categorizing different online business models
- Describing alternative online growth strategies
- Choosing strategies for maintaining team relationships that facilitate flexibility, collaboration and quick decision making
- Value chain definition
- Teamwork and communication skills
- Customer relationship management

**Principal reference(s):**

1. Marino L, Accad A, Barr TL. Leadership Through Entrepreneurship. Advanced Practice Nursing Leadership: A Global Perspective: Springer; 2020. p. 295-311.
2. Sanders E, Kingma M. Handbook on Entrepreneurial Practice. International Council of Nurses, Geneva. 2003.
3. Related articles and books

**Student assessment practices:**

- A summary of the concepts in the lesson cards
- Final examination
- Assessing the activities, students' attendance in class and their assignments

**Title of the Course:** Nursing Management and leadership

**Code of the course:** 05

**Number of Credits:** 2

**Type of the course:** Management courses

**Prerequisite:** -

**Principal objective(s) of the course:** The course focuses on administration development of the knowledge, skills, and abilities needed for leadership in nursing informatics. It provides an interdisciplinary and holistic approach to develop skills and knowledge in decision making, problem solving, and leadership.

**Course description:** Students will review the leadership role for improving practice and outcomes in client systems and care delivery. In addition, they will get familiar with translation of theory, knowledge, and evidence for the advancement of nursing informatics practice management.

**Main topics: 34 hours**

**Theory 2units (34 hours)**

- An introduction to the Principles of Management
- Nursing management, models and theories
- Evolutional leadership
- The process of decision-making and problem solving
- Communication and Human Relations and Motivation
- Philosophy and goals of nursing informatics management
- Determining system Requirements, Evaluation, Monitoring, and Planning
- Human resource planning
- Policy making
- Knowledge management
- Change Management
- Application of IT in nursing management and leadership
- Integration of theory, knowledge, and scientific evidence into leadership processes
- Intergroup relationship, communication and collaboration
- Strategic planning
- Critical thinking skills and effective communication skills in implementing the leadership role
- Leader behaviors and organizational elements, such as design, culture and effectiveness

**Principal reference(s):**

1. Hübner U, Shaw T, Thye J, Egbert N, de Fatima Marin H, Chang P, et al. Technology informatics guiding education reform–TIGER: an international recommendation framework of core competencies in health informatics for nurses. *Methods of information in medicine*. 2018;57(Suppl 1):e30.
2. Marquis BL, Huston CJ. *Leadership roles and management functions in nursing: Theory and application*: Lippincott Williams & Wilkins; 2009.
3. Rigolosi ELM. *Management and leadership in nursing and health care: An experiential approach*: Springer Publishing Company; 2012.

**Student evaluation methods:**

30% is offered for class assignment, such as: traditional nursing administration model analysis and factors of IT-based model identification - 70% is offered for final exam

**Title of the Course:** Fundamentals of Nursing Informatics

**Code of the course:** 06

**Number of Credits:** 1

**Type of the course:** Informatics courses

**Prerequisite:** -

**Principal objective(s) of the course:** The aim of this course is introducing the basic concepts of Nursing Informatics services in all aspects of Nursing Science; and to review the history of nursing informatics specialization and the required competencies, applications, opportunities, and challenges.

**Course description:** This course introduces the historical and theoretical foundations of the nursing informatics specialty in Nursing Profession, and the NI roles in the inter-professional team.in the widespread implementation and adoption of health information technologies for improving safety and quality of patient care.

**Main topics: 17 hours**

**Theory 1 units (17 hours)**

- Nursing informatics principles
- Definition of Nursing Informatics (NI)
- Historical Context of Nursing Informatics
- Competencies of nursing informatics specialists
- Nursing informatics standardized terminologies
- Introduction of Nursing Diagnosis Classification, NANDA
- Introduction of Nursing Outcome Classification System (NOC)
- Introduction of Nursing Intervention Classification System(NIC)
- Infrastructures, applications, opportunities and challenges of NI
- Preparing for the future of NI and future perspectives
- Trend of NI publications and development of NI in different countries
- Nursing Informatics Paradigm Shifting

**Principal reference(s):**

1. McCormick K, Saba V. Essentials of nursing informatics: McGraw-Hill Education; 2015.
2. Hebda T, Czar P. Handbook of informatics for nurses and health care professionals: Pearson Higher Ed; 2013. (recent ed)
3. Saba V. Clinical care classification (CCC) system version 2.5: user's guide: Springer Publishing Company; 2012.
4. Cashin A, Cook R. Evidence-Based Practice in Nursing Informatics: Concepts and Applications: Concepts and Applications: IGI Global; 2010.
5. Rodrigues JJ. Digital advances in medicine, e-health, and communication technologies: IGI Global; 2013.
6. Honey M, Collins E, Britnell S. Education Into Policy: Embedding Health Informatics to Prepare Future Nurses—New Zealand Case Study. JMIR Nursing. 2020;3(1):e16186.
- 7.

**Student assessment practices:** 30% is assigned to of studies reports - 70% is assigned to final exam



**Title of the Course:** Nursing Informatics Foundational Concepts

**Code of the course:** 07

**Credits:** 1

**Type of the course:** Informatics courses

**Prerequisite:** -

**Principal objective(s) of the course:** This course provides students with an overview and basic understanding of how informatics and information technology can be used to improve the delivery of quality patient care.

**Course description:** This course reviews the concepts of data, information, knowledge and communication. Information Technological Communications and informatics applications in the field of prevention, diagnosis, treatment and rehabilitation, and nursing care.

**Main topics: 17 hours**

**Theory 1 units (17hours)**

- Definition and description of nursing informatics, information science
- The need for nursing informatics in patient care
- The importance of the information and data elements
- Nursing data management
- The relationship between data, information and knowledge and Knowledge Circle
- NI classification systems
- Indicators of NI competencies: Computer Literacy, Information Literacy, Clinical Information Management
- Digital health and remote care
- Evidence-based nursing and data classification systems
- Informatics tools for nurses and how they apply
- Computer-based documentation and patient records
- Effective care plan
- Ethical principles to nursing informatics
- NI Scope and standards
- NI Project Management
- NI organizations

**Principal reference(s):**

- 1- Hebda T, Czar P. Handbook of informatics for nurses and health care professionals: Pearson Higher.
- 2- McCormick K, Saba V. Essentials of nursing informatics: McGraw-Hill Education.
- 3- Ball MJ, et al. Nursing informatics: where technology and caring meet. 4th ed. London ; New York: Springer.
- 4- Hübner U, Shaw T, Thye J, Egbert N, de Fatima Marin H, Chang P, et al. Technology informatics guiding education reform–TIGER: an international recommendation framework of core competencies in health informatics for nurses. Methods of information in medicine. 2018;57(Suppl 1):e30.
- 5- Darvish Asieh, Nursing Informatics: Evolution in health care, Anateb, Tehran, Iran. (Persian), 2017. Book.

**Student assessment practices:** 30% is assigned to studies reports - 70% is assigned to final exam

**Title of the Course:** Technology Solutions for Generating Knowledge in Nursing Care

**Code of the course:** 08

**Credits:** 2

**Type of the course:** Informatics courses

**Pre or co-requisite:** 06

**Principal objective(s) of the course:** The aim of this course is to familiarize students with concepts of information technology application in different areas of nursing, fields of education, research, management, clinical fields, and health care professionals' interaction.

**Course description:** The course will discuss techniques, concepts, technologies, and applications dealing with knowledge organizations. It provides in-depth knowledge in theoretical and practical applications of computing. The flexible program of study includes areas such as digital media, Web-based technologies and new technologies. The interdisciplinary approach allows students to integrate courses from several specialized areas to put forward technological solutions. Graduates are prepared for a variety of entries, midlevel technical and managerial positions within the Web technology, and computing industries for generating knowledge in nursing care.

**Main topics: 34 hours**

**Theory 2 units (34 hours)**

- Technology revolution
- An overview of computer information systems
- Internet Technologies
- Human-Computer Interaction
- An Introduction to Digital Communication Systems, networks and communication
- Telenursing, connections and issues
- Easy softwares in remote nursing care
- Mobile Data Management
- Technology application in education, research, management and clinical fields of Nursing Informatics
- Electronic Government
- Cybersecurity, System Security fundamentals
- Knowledge Management Systems
- Information Resources Management and related technologies

**Principal reference(s):**

- 1- Ball MJ, et al. Nursing informatics : where technology and caring meet. 4th ed. London ; New York: Springer; 2011.
- 2- Ball, et al, Nursing informatics: A health informatics , Interprofessional and global perspective, 5<sup>th</sup> ed. 2022
- 3- Fong B, Fong A, Li CK. Telemedicine Technologies: Information Technologies in Medicine and Digital Health: John Wiley & Sons; 2011.

**Student assessment practices:** 30% is assigned to studies reports - 70% is assigned to final exam

**Title of the Course:** Information Management Systems in Nursing

**Code of the course:** 09

**Credits:** 1

**Type of the course:** Informatics courses

**Prerequisite:** -

**Principal objective(s) of the course:** The aim of this course is to familiarize applicants with the information systems, infrastructures, advantages and challenges in nursing care. Likewise, the assessment and factors affecting the success of implementing IS will be studied.

**Course description:** In this course, students will review concepts of information systems and types of clinical management systems, and will be familiarize with the importance of nurses' involvement in the process of designing and managing health/nursing information systems.

**Main topics:** 17hours

**Theory 1 units (17 hours)**

- Concept of Information Management System
- Software Development Life Cycle (SDLC): planning, analysis, implementation and evaluation
- The role of Nurses in the design and development of Information Systems
- Artificial Intelligence, Nursing Leadership Considerations
- Issues that must be considered when planning to integrate artificial intelligence in practice
- Informatics Essential Competencies for all Nurses
- The impact of the competency gap on clinical care and critical decision making
- Domain of Informatics Competencies, the Scope and Standards of Nursing Informatics Practice
- Clinical information systems in nursing
- Data issues related to the outcomes of data analysis
- Data management, meaningful use, Information dashboards
- Data Security, levels of safety and access to health information
- Managing time, cost, human resources, communications and risks
- The success and failure factors

**Principal reference(s):**

- 1- Staudinger B, Ostermann H. Nursing and Clinical Informatics: Socio-Technical Approaches: Socio-Technical Approaches: IGI Global; 2009.
- 2- McWay DC. Today's health information management: An integrated approach: Cengage Learning; 2013.
- 3- Tan J. Developments in Healthcare Information Systems and Technologies: Models and Methods: Models and Methods: IGI Global; 2010.
- 4- Ball MJ, et al. Nursing informatics : where technology and caring meet. 4th ed. London; New York: Springer; 2011.
- 5- Akinsola JE, Ogunbanwo AS, Okesola OJ, Odun-Ayo IJ, Ayegbusi FD, Adebisi AA, editors. Comparative Analysis of Software Development Life Cycle Models (SDLC). Computer Science On-line Conference; 2020: Springer.

**Student assessment practices:** 50% is assigned to practical class assignments - 50% is assigned to final exam

**Title of the Course:** Advanced nursing informatics systems

**Code of the course:** 010

**Credits:** 2

**Type of the course:** Informatics courses

**Pre or co-requisite:** 06, 09

**Principal objective(s) of the course:** The aim of this course is to familiarize applicants with the emerging systems in nursing care such as decision support and artificial intelligent systems, as well as, success factors.

**Course description:** In this course, students will review the evolution of information systems and IS types, management of Decision Support Systems in Nursing, interdisciplinary communication and Intelligent systems.

**Main topics: 34 hours**

**Theory 2 units (34 hours)**

- The evolution of information systems
- The pyramid of systems
- Decision support systems (DSS) and expert systems in nursing care
- Types of Decision Support Systems in Nursing
- Point-of-care documentation
- Intelligent systems to support decisions
- Artificial Intelligent and healthcare systems
- Quality of nursing information systems
- The legal issues and privacy in health information systems
- Network, interagency and interdisciplinary communication
- Electronic health record (EHR)
- Hospital Information System (HIS) and nursing components
- Nursing Information Systems (NIS)
- Management Information Systems (MIS)
- Understanding and Management of Decision Support and nursing Information Systems
- The application and challenges of information systems in health/nursing care
- Individual and organizational factors
- Emerging systems in nursing care

**Principal reference(s):**

- 1- Warren JJ, Clancy TR, Delaney CW, Weaver CA. Big-Data Enabled Nursing: Future Possibilities. *Big Data-Enabled Nursing*: Springer; 2017. p. 441-63.
- 2- Orovigoicoechea C, Elliott B, Watson R. Evaluating information systems in nursing. *Journal of Clinical Nursing*. 2008;17(5):567-75.
- 3- Lee S. Features of computerized clinical decision support systems supportive of nursing practice: a literature review. *CIN: Computers, Informatics, Nursing*. 2013;31(10):477-95.
- 4- McMurtrey M. A case study of the application of the systems development life cycle (sdlc) in 21st century health care: Something old, something new? *Journal of the Southern Association for Information Systems*. 2013;1(1).
- 5- Hunt EC, Sproat SB, Kitzmiller RR, Kitzmiller RR. *The nursing informatics implementation guide*: Springer Science & Business Media; 2004.

- 6- Tan J. Developments in Healthcare Information Systems and Technologies: Models and Methods: Models and Methods: IGI Global; 2010.
- 7- Informatics and Nursing 6th Edition by Jeanne Sewell (Author), 2018.
- 8- Dee McGonigle, Nursing Informatics and the Foundation of Knowledge 5th Edition, Jones & Bartlett Learning; 5th edition, 2021

**Student assessment practices:** 40% is for giving presentation or seminar and students' assignments - 60% is for final exam

**Title of the Course:** Quality Improvement and Patient Safety

**Code of the course:** 011

**Number of Credits:** 2

**Type of the course:** Informatics courses

**Prerequisite:** -

**Principal objective(s) of the course:** The aim of this course is to familiarize students with the potential of incorporating current standards of quality and safety within the context of value-based healthcare system.

**Course description:** In this course, students will get familiar with Quality Outcomes and patient safety in a Culture of Value-Based Nursing Care regarding IT tools. Measuring health outcomes against the cost of delivering the outcomes are then extended to patients, providers, payers, suppliers, and society as a whole. This course introduces new healthcare delivery models, which stress a team-oriented approach to patient care and sharing of patient data so that care is coordinated, and outcomes can be measured easily. Emphasis is placed on performance and quality improvement methods that underlie value-based nursing care. The nurse in advanced practice today must exemplify the standards of quality and safety and be prepared to lead the delivery of value-based patient-centered care.

**Main topics: 34 hours**

**Theory 2 units (34 hours)**

1. Understanding the fundamental principles and lessons of the patient safety movement
2. Establishing measurable metrics and processes to evaluate the effectiveness of value-based care strategies and initiatives and medical errors and patient safety.
3. Assuming a leadership role in the design and implementation of a quality monitoring system for use in quality improvement.
4. Developing a systematic process that incorporates quality measures and benchmarks to assess quality outcomes and safety and satisfaction
5. Analyzing the culture of continuous quality improvement and the provision of value-based care to optimize patient outcomes.
6. Integrating performance and process improvement methodologies to develop solutions for identified quality and safety gaps in the practice setting
- 7- Optimizing implementation Informatics tools and information technology to improve nursing care quality outcome

**Principal reference(s):**

- 1- Oldland E, Botti M, Hutchinson AM, Redley B. A framework of nurses' responsibilities for quality healthcare—Exploration of content validity. *Collegian*. 2020;27(2):150-63.
- 2- Hughes R. Patient safety and quality: An evidence-based handbook for nurses. Rockville, MD: Agency for Healthcare Research and Quality 2008.
- 3- Darvish A, Bahramnezhad F, Keyhanian S, Navidhamidi M. The role of nursing informatics on promoting quality of health care and the need for appropriate education. *Global journal of health science*. 2014;6(6):11.

**Student assessment practices:** 40% is for giving presentation or seminar and students' assignments - 60% is for final exam

**Title of the Course:** Nursing Database Systems: Analysis, Design and Management

**Code of the course:** 012

**Credits:** 2

**Type of the course:** Informatics courses

**Pre or co-requisite:** 010, 011

**Principal objective(s) of the course:** The aim of this course is to familiarize students with the general methods of analysis, design, development and management of information databases and critical components and applications.

**Course description:** This course challenges participants to critically explore modern database design and application in contemporary society. After delivering the fundamental principles and techniques required for modern database management, the unit challenges participants to develop innovative database solutions to practical problems, through novel application of data modelling techniques, and commercial and open-source database tools. The opportunities, challenges, and implications of big data, social media, data analytics, and unstructured data on conventional database systems are explored in parallel.

**Main topics: 51 hours**

**Theory two units (17hours)**

- Critically evaluation of data and database definitions and concepts.
- Developing novel solutions to practical data management challenges using modern database tools and data modelling techniques.
- Critically exploring the organizational, societal, and technical impact of big data, unstructured data, and modern data analytics tools on database system design and management.

**Practice one unit (34 hours)**

- Systems Analysis and Design
- Database systems and models
- The evaluation of database management systems (DBMS)
- Web Application Development
- An overview of a nursing database

**Principal reference(s):**

1. Shanker U, Misra M, Sarje AK. Distributed real time database systems: background and literature review. Distributed and parallel databases. 2008;23(2):127-49.
2. Letkowski J. Doing database design with MySQL. Journal of Technology Research. 2015;6:1.
3. Warren JJ, Clancy TR, Delaney CW, Weaver CA. Big-Data Enabled Nursing: Future Possibilities. Big Data-Enabled Nursing: Springer; 2017. p. 441-63.
4. McMurtrey M. A case study of the application of the systems development life cycle (sdlc) in 21st century health care: Something old, something new? Journal of the Southern Association for Information Systems. 2013;1(1).
5. Hunt EC, Sproat SB, Kitzmiller RR, Kitzmiller RR. The nursing informatics implementation guide: Springer Science & Business Media; 2004.
6. Database Systems: Design, Implementation, & Management 13th ed, 2018 by Carlos Coronel (Author), Steven Morris

**Student assessment practices:** 40% is assigned to class assignments and projects with the approval of the lecturer - 60% is assigned to final exam

**Title of the Course:** Project Management and Healthcare Information Technology

**Code of the course:** 013

**Credits:** 2

**Type of the course:** Informatics courses

**Prerequisite:**

**Principal objective(s) of the course:** The aim of this course is presenting an effective methodology that encompasses standards and best practices from project management, information technology management, and change management for a streamlined transition to health and nursing care

**Main topics: 34 hours**

**Theory two units (34hours)**

- Integrating project, information technology, and change management methodologies
- Initiating, planning, executing, controlling, and closing
- Project management knowledge areas--integration, scope, time, cost, quality, human resource, communication, risk, and procurement management
- IT management knowledge areas--user requirements, infrastructure, workflow, security, interface, testing, and support management
- Change management knowledge areas--realization, sponsorship, transformation, training, and optimization management
- Successful project implementations.

**Principal reference(s):**

1. Sipes C. Project management for the advanced practice nurse: Springer Publishing Company; 2019.
2. Marouni H. Project Management for Healthcare Information Technology. Quality Progress. 2012;45(3):59.
3. Project Management for Healthcare Information Technology, By Scott Coplan, David Masuda

**Student assessment practices:** Student must give seminars and take final exams



**Title of the Course:** Ethical and Legal Aspects of Health Information Technology

**Code of the course:** 014

**Credits:** 1

**Type of the course:** Informatics courses

**Prerequisite:** -

**Principal objective(s) of the course:** This course covers concepts and principles of law found in the healthcare field. The course focuses on legal issues regarding health information in nursing care.

**Course description:** This course includes topics confidentiality, release of health information, consent forms, liability of healthcare providers, concepts of risk management in the healthcare field, and other current medical/legal issues.

**Main topics: 17 hours**

**Theoretical one units (17hours)**

- Definition of privacy, security, confidentiality, legal policies and procedures, and ethical issues;
- Legal principles impacting Health Information Technology
- Identify the role of the health information professional in legal healthcare compliance
- Patient consent
- legal reporting requirements
- Patient safety

**Principal reference(s):**

1. Sharmil SH. Awareness of community health nurses on Legal Aspects of Health care. International Journal of Public Health Research. 2011(Special issue):199-212.
2. Berner ES, editor Ethical and legal issues in the use of health information technology to improve patient safety. HEC forum; 2008: Springer Science & Business Media.

**Student assessment practices:** Student must give seminars and take final exams

**Title of the Course:** Electronic Education and Learning

**Code of the course:** 015

**Number of Credits:** 2

**Type of the course:** Elective courses

**Prerequisite:** -

**Principal objective(s) of the course:** The aim of this course is to familiarize students with the potential of internet communication and new technologies in learning and teaching. Students will be able to analyze electronic education infrastructure, and synchronous and asynchronous e-learning outcomes.

**Course description:** In this course, students will get familiar with e-learning infrastructure and its advantages and weaknesses, implementation of methods and models, principles of content development, and foundations of pedagogy and andragogy. They review the criteria for evaluating the success of e-Learning business and related rules.

**Main topics: 34 hours**

**Theory 2 units (34 hours)**

1. Types of Distance Education
2. Evolution and development of e-learning
3. Infrastructure and virtual University
4. The integrated e-learning and its application in nursing education
5. Patient education and e-learning
6. Introduction to Learning Management Systems (LMS) and its components
7. Teaching-learning approaches in e-learning: principles of effective learning
8. The development of educational content of e-learning
9. Factors affecting success of e-learning
10. E-learning training and regulations
11. Evaluation in e-learning system

**Principal reference(s):**

1. O'Neil CA, Fisher CA, Rietschel MJ. Developing online learning environments in nursing education: Springer Publishing Company; 2013.
2. Harerimana A, Mtshali NG. Conceptualisation of e-learning in nursing education in the context of Rwanda. Journal of Nursing Education and Practice. 2020;10(6).
3. Arshavskiy, Marina, Instructional Design for ELearning: Essential guide to creating successful eLearning courses.

**Student assessment practices:** 40% is for giving presentation or seminar, students' assignments - 60% is for final exam

**Title of the Course:** Practicum in Nursing Informatics

**Code of the course:** 016

**Credits:** 3

**Type of the course:** Informatics courses

**Pre or co-requisite:** 012, 013

**Principal objective(s) of the course:** The aim of this course is to provide opportunities for practical experience in implementing the knowledge and skills of nursing informatics by reviewing, and developing a real system, gap analyzing, designing, implementing, evaluating and report the application of IT.

**Course description:** The practicum course will focus on the project management process skills and expertise. Students do an actual project, real-time, at a facility with the supervision of a mentor to meet educational goals and professional plan.

The practicum provides students with the opportunity to view the organization as an experienced informatics leader and with practice skills learned from previous courses.

**Main topics: 102 hours**

**Practical three units (102hours)**

- Examine the role, functions and scope and standards of practice of the informatics nurse.
- Explore, analyze, apply and evaluate diverse aspects of nursing-informatics practice as a specialization.
- Identify factors related to information technology that can improve care processes
- Develop an awareness of the role of informatics nurses
- Conceptualize the current situation, and proposes models of improvement regarding integration of IT.
- Integrate principles of evidence-based practice and appropriate theoretical frameworks into the informatics nurse role as the foundation for the assessment of nursing care problem
- Conducting an analysis of a nursing care problem and the purpose of improving care systems and health outcomes
- Interpret the results of problem analysis to ascertain the primary determinants that contribute to the achievement of optimal outcomes.
- Modeling the assessment of health and nursing care problems
- Analyzing the process of assessment in utilizing principles of evidence-based practice and appropriate theoretical frameworks
- Engaging in critical reflection regarding the components of the professional role of the informatics nurse
- Training by certified teachers in selected area providing the required guidance
- Preparation for the nursing process flowchart through informatics view
- Inspections of computer and medical records
- The inspections of systems employed such as evaluation and management information systems, HIS, DSS, EHR
- Consulting and developing teamwork
- Identifying areas for improvement
- Project Development

**Principal reference(s):**

- 1- Sipes C. Project management for the advanced practice nurse: Springer Publishing Company; 2019.
- 2- Ball MJ, et al. Nursing informatics: where technology and caring meet. 4th ed. London ; New York: Springer; 2011.
- 3- Rew L, Cauvin S, Cengiz A, Pretorius K, Johnson K. Application of project management tools and techniques to support nursing intervention research. *Nursing outlook*. 2020;68(4):396-405.
- 4- Sipes C. Project Management: Essential Skill of Nurse Informaticists. In *Nursing Informatics 2016*.
- 5- Murphy LS, Wilson ML, Newhouse RP. Data analytics: making the most of input with strategic output. *JONA: The Journal of Nursing Administration*. 2013 Jul 1;43(7/8):367-70.
- 6- Akinsola JE, Ogunbanwo AS, Okesola OJ, Odun-Ayo IJ, Ayegbusi FD, Adebisi AA. Comparative Analysis of Software Development Life Cycle Models (SDLC). In *Computer Science On-line Conference 2020 Jul 15* (pp. 310-322). Springer, Cham.
- 7- Hunt EC, Sproat SB, Kitzmiller RR, Kitzmiller RR. *The nursing informatics implementation guide*. Springer Science & Business Media; 2004 Apr 2.

**Student assessment practices:**

- The report of the NI assessment: 30%
- Setting up the project: 40%
- Presentations and training projects, 30%