

**In the Name of God**



**Tehran University of Medical Sciences**

**School of Nursing and Midwifery**

**Medical Surgical Nursing (Basic Science) Department**

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

**Nursing Informatics (MSc Degree)**

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**Final revision and editing for Deputy of chancellor**

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## **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)

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 disciplines. 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 graduate with master degree at Maryland University from 1998-2010. It is offered in many universities (mostly in USA) now.

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

Nursing Informatics Specialty is the integration of nursing science, computer science, and information science. The graduates will be able to carry out evidence-based practice through computer-based health care information systems; they are required to analyze, model, collect, and organize information, and make decisions based on factual information and knowledge to improve clinical nursing care.

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

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

**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 outcomes. TUMS will be recognized for leadership and excellence in education, health

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<sup>1</sup> -Nursing Informatics

information technology policy, and nursing informatics applications at national and international levels.

**Mission:** The mission of the course is enhance 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
- 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, e-mail 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 monitoring systems
- Networks for communication, portable electronic systems
- Searching and retrieving patient demographic information
- Software platforms such as Windows, slides, multimedia
- Entering patient structured data

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

- Diagnosis of data important 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 system
- Electronic communication network
- Convincing nurses that use of computers in nursing requires no programming skills mastery
- Identification of the major components of a computer
- Identification of human-computer interaction to enhance care quality

**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 help patients
- Encouraging the other nurses in contributing to the use of computer 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

**The Terms and Conditions of Admission to the Course** (specific conditions including exams, interviews, CVs, Recommendations, etc.)

- Prospective Students with a BSc in Nursing can apply for a direct entry into this MSc program.
- Prospective Students with a BSc in Nursing and a master degree in a different field may also can apply for an entry into this MS 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 and DLN or 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 to information technology websites; clinical practice in health care fields.

### 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 and optional courses)

- Core courses (7 credits)
- Management courses (4 credits)
- Informatics courses (17credits)
- Dissertation (6 credits)
- Up to 9 credits may be waived if the students have previously taken courses the faculty deems to be equivalent.

Core courses (may be taken in any order)

Lesson code	Lesson name	credits	hours			Pre requisite
			Theory	Practice	sum	
01	Medical Information Systems :Information Retrieving Skills	1	9	17	26	
02	Electronic Education and Learning	2	34		34	
03	Research Methodology for Evidence Based Practice	2	34		34	
04	Biostatistics for Evidence Based Practice	2	34		34	

Management courses may be taken in any sequence:

Lesson code	Lesson name	credits	hours			Pre requisite
			Theory	Practice	sum	
05	Economics and Nursing Management	2	34		34	
06	Nursing management and leadership	2	34		34	

### Informatics courses

Lesson code	Lesson name	credits	hours			Pre requisite
			Theory	Practice	sum	
07	Technology Solutions for Generating Knowledge in Nursing Care	3	17	34	51	
08	Nursing Care Database Systems: Analysis and Design	3	34	34	68	
09	Information Management Systems in nursing	3	34	34	68	
010	Nursing Informatics Concepts and Practice in Systems Adoption	3	51		51	012
011	Practicum in Nursing Informatics	3		102	102	010
012	Nursing Informatics fundamentals	2	34		34	
013	Thesis*	6				
Total credits		34				

#### **\*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.

#### **Ethical issues**

The graduates should,

- Observe the Patient's Bill of Rights<sup>1</sup> when working with the patients.

- Strictly observe Biosafety and Patient Safety Rules\* concerning the patients, personnel and workplace.
- Observe the Rulebook for Dress Code<sup>2</sup>.
- Strictly observe the Regulations of Working with the Laboratory Animals<sup>3</sup>.
- 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.

1, 2 and 3 are contained in the Enclosures.

\* Biosafety and Patient Safety Rules will be set out by the Educational Departments and will be available to the students.

## Section II

**Title of the Course:** Medical Information Systems: Information Retrieving Skills

**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 medical information 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 medical information systems and their functions, infrastructure and challenges, and general computer and software applications. Moreover, information retrieving skills such as doing searches 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 medical information systems
- Infrastructure, applications and challenges
- History of the Internet
- The main points of general search on the Web
- The information retrieving models

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

- Highlights of the common software such as Word application
- Working with search engines, Google, operators and services
- Communication over the Internet and Email Management
- An Introduction to nursing databases
- Searching the digital library
- Learning to Search on Pubmed
- The Medical Subject Headings (MeSH)
- An Introduction to related websites

**Principal reference(s):**

1. Hebda T, Czar P. Handbook of informatics for nurses & healthcare professionals. 5th ed. Upper Sanddle River: Pearson; 2013.

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:** Electronic Education and Learning

**Code of the course:** 02

**Number of Credits:** 2

**Type of the course:** Core 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. Internet-based learning
4. E-Learning infrastructure
5. Virtual University
7. The combined e-learning and its application in nursing education
8. The need for e-learning
9. E-learning models
10. Introduction to Learning Management Systems (LMS) and its components
11. Teaching-learning approaches in e-learning: principles of effective learning
12. The development of educational content of e-learning
13. Basics of e-learning pedagogy and andragogy
14. Factors affecting success of e-learning
15. E-learning training and regulations
17. The methods of evaluation in e-learning system

**Principal reference(s):**

1. Glen S, Moule P. E-learning in nursing. Basingstoke England; New York: Palgrave Macmillan; 2006.

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

**Title of the Course:** Research Methodology 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:** 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 findings 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
- An 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. LoBiondo-Wood G., Haber J. Nursing Research: Methods and Critical Appraisal for Evidence-Based Practice, 8th Ed. Elsevier, 2013.
2. Burns N, Study Guide for The Practice of Nursing Research: Appraisal, Synthesis, and Generation of Evidence sixth Ed., Saunders, 2009.

3. Polit DF, Beck CT. Essentials of nursing research: appraising evidence for nursing practice. 7th ed. Philadelphia: Wolters Kluwer Lippincott Williams & Wilkins; Last Ed. 2010.
4. Khoumbati K. Handbook of research on advances in health informatics and electronic healthcare applications : global adoption and impact of information communication technologies. Hershey, PA: Medical Information Science Reference; 2010.
5. Lazakidou AA, Siassiakos KM. Handbook of research on distributed medical informatics and e-health. Hershey: Medical Information Science Reference; 2009.

**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:** 04

**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: Economics and Nursing Management**

**Code of the course:** 05

**Number of Credits:** 2

**Type of the course:** Management courses

**Prerequisite:** -

**Principal objective(s) of the course:** This course explores healthcare finance and economics from the perspective of nursing informatics, health care providers, and non-financial managers of health services. Financial management principles, the healthcare reimbursement system, reimbursement process, and factors influencing the financial environment are discussed with emphasis on strategies to promote and sustain the financial viability of healthcare.

1. Investigating the impact of the health care reimbursement system, reimbursement processes, and models of health care practices on the fiscal viability of health and nursing care services.
2. Employing basic accounting and finance concepts and practices in the development and management of a budget.
3. Analyzing strategies for predicting costs, facilitating productivity, and achieving quality outcomes within health care settings.
4. Applying cost benefit and variance analysis in planning and monitoring a budget.
5. Applying strategies for optimizing reimbursement through compliant billing and coding

### **Course description:**

**Main topics: 34 hours**

#### **Theory 2 units (34 hours)**

- The definition and concepts of health economics
- Supply and demand in the health system
- Models of nursing care practices and informatics applications
- Prioritizing the health and nursing care needs of the community
- The efficiency and effectiveness of nursing care, public health and health economics
- Entrepreneurship and e-business in nursing informatics
- Methods of payment and financing of the electronic health system
- Insurance, supplying out of public funds
- Methods and models of allocation of resources
- Issues of the nursing care system and economy
- Challenges of the health economy
- Health economy in developed countries
- Analysis of cost - effectiveness
- Analysis of cost – benefit
- Nursing care and telenursing employees' income
- Evaluating methods and models of resource allocation in nursing informatics

**Principal reference(s):**

1-McPake, B.; Normand, C. Health Economics in International perspective. Taylor Francis. 2013.

2-Folland, S. Goodman, A.C. and Stano M. Economics of Health and Health Care. Pearson Prentice-Hall, New Jersey. 2012.

**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:** 06

**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**

**Theoretical 2units (34 hours)**

- An introduction to the Principles of Management
- Nursing management, models and theories
- 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
- Application of IT in nursing management and leadership
- Integration of theory, knowledge, and scientific evidence into leadership processes
- Intergroup relationships in nursing informatics systems
- Strategies for applying mentoring models to enhance role implementation of nursing professionals
- 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-Marquis, BL., and Huston, CJ. Leadership Roles and Management Functions in Nursing; theory and application. 8th Ed. Philadelphia: Wolters Kluwer/ Lippincott. 2014.

2-Rigolosi ELM. Management and leadership in nursing and health care : an experiential approach. 3rd ed. New York: Springer; 2013.

**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:** Technology Solutions for Generating Knowledge in Nursing Care

**Code of the course:** 07

**Credits:** 3

**Type of the course:** Informatics courses

**Prerequisite:** -

**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: 51 hours**

**Theory one unit (17 hours)**

- Technology revolution
- An overview of computer information systems
- Internet Technologies
- Human-Computer Interaction
- An Introduction to Digital Communication Systems
- Telenursing
- Mobile Data Management
- Systems and Information Integration
- Technology application in education, research, management and clinical fields of Nursing Informatics
- Electronic Government
- Cybersecurity, System Security fundamentals

**Practice two units (34 hours)**

- Data Communications and Networks
- Decision making and Information Technologies
- Knowledge Management Systems
- Remote connections and Issues
- Easy Software in telenursing
- Knowledge Translation



- Information Resources Management and related technologies
- Technologies, Marketing and E-commerce
- Customer Service Management Systems

**Principal reference(s):**

- 1- Ball MJ, Hannah KJ. Nursing informatics : where technology and caring meet. 4th ed. London ; New York: Springer; 2011.
- 2- Fong B, Fong ACM, Li CK. Telemedicine technologies : information technologies in medicine and telehealth. Chichester, West Sussex, U.K.: John Wiley & Sons; 2011.

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

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

**Code of the course:** 08

**Credits:** 3

**Type of the course:** Informatics courses

**Prerequisite:** -

**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 their critical components and applications.

**Course description:** In this lesson, students review the fundamentals and concepts, and importance of collecting and organizing information together with an overview of various types of medical and nursing databases. Students are taught the basics of Structured Query Language, and learn about issues in database analysis, design, implementation and management. Meanwhile, issues of e-health and related databases will be reviewed. Due to changes in hardware and bandwidth, systems are changing. Since multiple processors, gigabit network speeds, and the Internet as a platform for distributed data are on constant development, systems are changing the way computing gets done. This course will review database systems from conceptual and practical standpoints.

**Main topics: 68 hours**

**Theory two units (34hours)**

- An Introduction of data processing systems, file systems, databases
- Data models: hierarchical databases, relational databases, object-oriented databases
- Selection and acquisition of database management systems
- Relational Database Concepts and Applications
- Enterprise Database Administration
- Web Database Development
- Ethics and Information in Technology

**Practice one unit (34 hours)**

- Data Warehouses
- Web Application Development
- Systems Analysis and Design
- Database systems and models
- The evaluation of database management systems (DBMS)
- Integration Servers
- Integration Patterns
- An Overview of a nursing database

**Principal reference(s):**

1. P. J. Fortier, "Database Systems Handbook", MC Graw-Hill, 1997.
2. C. g. Date, "An Introduction To Database Systems", 8th Edition, Addison-Wesley, 2003.
3. Robin. Bloor, Howard. Philip, "Databases: An Evaluation and Comparison", Buttler Bloor Ltd, 1992.

4. Fleming, Barbara. Halle, "Handbook of Relational Database Design", Addison- Wesley, 1989.
5. Kathy. Hading, "Microsoft SQL Server 2000 (Databases Design and Implementation)" , New York, Microsoft, 2003.

**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:** Information Management Systems in nursing

**Code of the course:** 09

**Credits:** 3

**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 their challenges in nursing care. Likewise, the assessment and factors affecting the success of IS will be studied.

**Course description:** In this lesson, students will review concepts of information systems, and they are required to learn how to manage and implement health and nursing information systems before designing information systems. They will be introduced the clinical management systems, standards and ethical issues. This course also reviews interoperation of systems. Students will keep in touch with the latest technologies and data research methods, and information integration to gain experience of integrating information systems.

**Main topics: 68 hours**

**Theory two units (34hours)**

- The evolution of information systems
- The information requirements and system components
- The application and challenges of information systems in health care and nursing science
- The system life cycle: planning, analysis, implementation and evaluation
- Levels of the information system
- Integrated management systems
- Clinical Information Systems
- Installing intelligent systems to support management decisions
- The success and failure factors
- Review of standards in e-health
- Data Recovery and security, levels of safety and access to health information
- Managing time, cost, human resources, communications and project risks
- Quality of nursing information systems
- The legal issues and privacy in health information systems

**Practice one unit (34 hours)**

- Modeling Data
- Metadata
- Context-Awareness
- Network and information systems
- Electronic health record (HER)
- Introducing the HIS system components, such as LIS, FIS, DIS, RIS, and CPOE etc.
- Nursing Information Systems(NIS)
- Management Information Systems(MIS) in different levels

**Principal reference(s):**

- 1- McCuen C, Sayles NB, Schnering P. Case studies in health information management. Clifton Park, NY: Thomson Delmar Learning; 2008.
- 2- Beaver K. Healthcare information systems. 2nd ed. Boca Raton, Fla.: Auerbach Publications; 2003.

- 3- Tan JKH. Developments in healthcare information systems and technologies : models and methods. Hershey: Medical Information Science Reference; 2011.
- 4- Ball MJ, Hannah KJ. Nursing informatics : where technology and caring meet. 4th ed. London ; New York: Springer; 2011.

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

**Title of the Course:** Nursing Informatics Concepts and Practice in Systems Adoption

**Code of the course:** 10

**Credits:** 3

**Type of the course:** Informatics courses

**Prerequisite:** 12

**Principal objective(s) of the course:**

The aim of this course is to familiarize nurses with nursing informatics concepts and its application in all areas of nursing and related systems.

**Course description:** In this course, topics such as nurse interaction with computers and Internet technology, e-health systems, applications of informatics in clinical practice, research, administration, and nursing education are studied. Students review experiences and future challenges of nursing informatics.

**Main topics: 51 hours**

**Theoretical three units (51hours)**

- Basics of IT
- Concepts of nursing informatics
- Infrastructures, applications, opportunities and challenges
- Nurses interacting with computers and technology
- Internet-based systems and Nursing
- Health care policy and nursing informatics systems
- Evidence-based nursing and data classification systems
- Modeling and simulation of biological systems
- Information support systems for decision support
- Communication of nursing care provider and nursing care seeker
- Remote systems experiences
- Portable electronic systems
- Introduction to the use of informatics tools for the design of effective care plan(ICNP)
- Nursing Intervention Classification System(NIC)
- Nursing Outcome Classification System(NOC)
- Legal and ethical issues in making use of information technology systems in nursing
- Information literacy and computer literacy
- Promoting culture of nursing informatics systems application
- Nursing informatics experiences in the world
- Future trends of Nursing Informatics systems

**Principal reference(s):**

1. Hebda T, Czar P. Handbook of informatics for nurses & healthcare professionals. 5th ed. Upper Saddle River: Pearson; 2013.
2. Saba VK, McCormick KA. Essentials of nursing informatics. 5th ed. New York: McGraw-Hill Medical; 2011.
3. Kumar S, Snooks H. Telenursing. London: Springer; 2011.

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

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

**Code of the course:** 11

**Credits:** 3

**Type of the course:** Informatics courses

**Prerequisite:** 10

**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, or reviewing a real system to analyze the application of IT in it. This module focuses on the comprehensive and systematic analysis and assessment of nursing care problems especially in complex situations. Students will write their report and present the recommendations for enhancing productivity of nursing care with the integration of informatics tools.

**Course description:** In this lesson, students practice the knowledge acquired in the field of nursing informatics and examine the nursing process, diagnosis, and standards. They will identify factors related to information technology that can improve care processes. This course will also develop an awareness of the role of informatics nurses. Moreover, it provides an opportunity for students to conceptualize the current situation, and proposes models of improvement for integration of IT.

- Integrating 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 for the purpose of improving care systems and health outcomes.
- Interpreting the results of problem analysis to ascertain the primary determinants that contribute to the achievement of optimal outcomes.
- Modeling the assessment of healthcare 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

**Main topics: 102 hours**

**Practical three units (102hours)**

- Training by certified teachers in selected area providing the required guidance
- Preparation for the nursing process flowchart
- 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
- Presenting the recommended Proposal
- Development projects

**Principal reference(s):**

- 1- Ball MJ, Hannah KJ. Nursing informatics: where technology and caring meet. 4th ed. London ; New York: Springer; 2011.

**Student assessment practices:**

- The report of the NI assessment: 30%

- Setting up the project: 40%
- Presentations and training projects, 30%



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

**Code of the course:** 12

**Number of Credits:** 2

**Type of the course:** Informatics courses

**Prerequisite:** -

**Principal objective(s) of the course:** The aim of this course is to introduce 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 reviews the concepts of data, information, knowledge and communication. Information Technological communications and computer applications in the field of prevention, diagnosis, treatment and rehabilitation, and nursing care will be reviewed. Making use of information technology in the areas of management, practice, research and teaching will be covered as well.

**Main topics: 34 hours**

**Theory two units (34hours)**

- Nursing informatics terminologies and standards
- Characteristics of nursing informatics specialists
- The importance of the information and data elements
- Knowledge Circle
- Telecommunication, networks, remote care, and telenursing
- Computer-based documentation and patient records
- Complexity of human-computer interaction
- The International Classification for Nursing Practice (ICNP)
- Making use of computers in nursing diagnosis and practice
- Application of Information Technology in education management and self-care
- Application of IT in research and information dissemination activities
- The development, coordination, and interoperability of health data
- TIGER Innovation (Technology Informatics Guiding Educational Reform)
- Emergency services and communities
- Special Topics such as EBN, Knowledge Management in nursing, and EHR
- Social and cultural issues in technology acceptance
- Potentials of NI development
- Experiences and consequences of making use of information technology in nursing

**Principal reference(s):**

1. Saba VK, McCormick KA. Essentials of nursing informatics. 5th ed. New York: McGraw-Hill Medical; 2011.
2. Hebda T, Czar P. Handbook of informatics for nurses & healthcare professionals. 5th ed. Upper Sanddle River: Pearson; 2013.
3. Berman JJ. Methods in medical informatics : fundamentals of healthcare programming in Perl, Python, and Ruby. Boca Raton: Taylor & Francis; 2011.
4. Cashin A, Cook R. Evidence-based practice in nursing informatics : concepts and applications. Hershey, PA: Medical Information Science Reference; 2011.
5. Rodrigues J. Digital advances in medicine, e-health, and communication technologies. Hershey, PA: Medical Information Science Reference; 2013.

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