

Course Syllabus

BMT 485

1. Course number and name: **BMT 485/ Biomedical Computing**
2. Credits and contact hours: (3 + 1) credit hours, (3 +2) contact hours
3. Instructor's name: **Prof. Nabil A. Alrajeh**
4. Text book, title, author, and year:
 - a. **Books or notes:** Biomedical Informatics: Computer Applications in Health Care and Biomedicine. By [Edward H. Shortliffe](#) (Editor), [James J. Cimino](#) (Editor). ISBN-13: 978-1447144731 ISBN-10: 1447144732 Edition: 4th ed. 2014 , Springer-Verlag
 - g. other supplemental materials:
 - Title: Health Information Systems: Concepts, Methodologies, Tools, and Applications
Author(s)/Editor(s): Joel J.P.C. Rodrigues
ISBN13: 9781605669885; EISBN13: 9781605669892
URL: www.igi-global.com/book/health-information-systems/37245
5. Specific course information
 - a. brief description of the content of the course:

Biomedical computing course provides students a conceptual framework for understanding Health Informatics and applications of information technology in the healthcare environment. The course will include in-depth discussion of how to use of technology in health care systems with emphasis on leveraging technology to improve quality and efficiency in care delivery. Moreover, the course provides an overview of the most important aspects of health informatics that will impact the clinical research, education, health management and clinical services.
 - b. prerequisites or co-requisites:

Pre-requisites: BMT413
Co-requisites: NA
 - c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: **Required**
6. Specific goals for the course

a) specific outcomes of instruction:

1. Explain biomedical computing and its role in health, health care, public health, medical education and biomedical research.
2. Compare and contrast the roles of various individuals in the health information technology workforce.
3. Define the major challenges to health information technology adoption in health care organizations
4. Describe and compare the best practice approaches to systems acquisition and system design.
5. Identify the essential functions of the electronic health record (EHR) and the barriers to its use.
6. Identify the components of the software development life cycle applied to health care
7. Explain the process of computerized provider order entry and challenges to its use.
8. Differentiate the difference among privacy, confidentiality, and security and their role in the HIPAA regulations.
9. Explain the importance of standards and interoperability of clinical data and the major initiatives underway to create and enable them.
10. Describe the management of images in clinical settings, including the use of PACS systems.
11. Classify the different types of telehealth and their efficacy as shown in clinical studies.
12. Explain how people and organizational issues impact the use of health information technology and criteria for selecting the proper hospital information systems.
13. Explain the process of using Information technology in Patient monitoring to improve the health quality.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

	Course outcome	Abet (a-k)
1	This course is designed to introduce the fundamental principles of medical informatics. It is taught so that individuals with various backgrounds, including those with medical, computer science, or other backgrounds, can become familiar with information management and computer applications in health care. Students select and apply knowledge of mathematics, science, engineering, and technology to health information problems	b
2	an ability to analyze, design, and implement biomedical systems, components or processes for broadly-defined engineering technology problems appropriate to program educational objectives.	d

3	an ability to apply written, oral, and graphical communication in both technical and nontechnical environments; and an ability to identify and use appropriate technical literature.	g
4	a knowledge of the impact of engineering technology solutions in a societal and global context and an understanding of the clinical application of biomedical equipment.	j

c. Brief list of topics to be covered

Topics
1. Biomedical Informatics: The Science and the Pragmatics
2. Biomedical data : their acquisition, storage, and use.
3. Computer Architectures for Health Care and Biomedicine
4. Electronic Health Record Systems
5. Computer In Healthcare Education
6. Telehealth
7. Software Engineering for Healthcare and Biomedicine
8. Imaging systems 1
9. Imaging systems 2 (PACS)
10. Patient-monitoring system
11. Standards in Health Informatics
12. Criteria for Selecting Health Information Systems
13. Future uses of Health Informatics and important Concepts

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
a.	1 midterm test	7th	20%
b.	Assignments	weekly	5%
c.	Project	13 th	15%
d.	Practical	Weekly	20%
e.	Final	15 th	40%