Syllabus

This is a single, concatenated file, suitable for printing or saving as a PDF for offline viewing. Please note that some animations or images may not work.

Course Description

This module is also available as a concatenated page, suitable for printing or saving as a PDF for offline viewing.

MET CS 570
Biomedical Sciences and Health IT

This course is designed for IT professionals, and those training to be IT professionals, who are preparing for careers in healthcare-related IT (Health Informatics). This course provides a high-level introduction into basic concepts and terminologies of biomedicine and provide insights into the structure and organization of the American healthcare system and how it is intertwined with IT. The course introduces medical terminology, human anatomy and physiology, disease processes, diagnostic modalities, and treatments used to manage some common diseases. IT case studies demonstrate the key roles of health informatics and how IT tools and resources help medical professionals integrate multiple sources of information to make diagnostic and therapeutic decisions.

In each session, the students will first be introduced to biological function, pathology, laboratory medicine, diagnostic imaging and therapeutic interventions covering specific medical specialties. On this basis, the students will gain an understanding as to the types of information being gathered and what is important to the clinical professionals. The second part of each module will consist of a case study demonstrating the overlap of biology, medicine, and health informatics. Throughout the modules, the students will also be introduced to various aspects of American healthcare system and healthcare IT.

To reinforce the lecture and case study material, we anticipate inviting one to two guest lecturers to share their first-hand experience with students. Student activities include participation in class lectures, assignments, discussions, graded quizzes, and exercises (self-assessment, not graded).

This course has been designed in accordance with Master's Degree curriculum requirements within the Accreditation Standards for Health Informatics and Health Information Management educational programs.

Technical Note

The table of contents expands and contracts (+/- sign) and may conceal some pages. To avoid missing content pages, you are advised to use the next/previous page icons in the top right corner of the learning modules.

Course Objectives

- Identify the anatomy, physiology, and pathophysiology of human body systems
- Recognize common diagnostic methods, treatments, and medical procedures
- Understand medical decision making in the diagnosis and treatment of human organ system disease
- Predict the IT needs of healthcare providers as they diagnose and treat common diseases
- Describe IT systems needed to support modern diagnostic imaging
- Understand the transfer of information from various sources to the centralized electronic health record
- Learn the basic delivery, financial and legal aspects of the American healthcare system

Learning Outcomes

By successfully completing this course you will:

- Develop familiarity with biomedical terminology
- Become familiar with the overall structure of American Health Care System
- Understand the roles and business of Health Informatics
- Know how to search for, identify, and download biomedical on-line material
- Be able to advance your knowledge of Health Informatics by taking additional courses or through self-study

Prerequisites

None

Course Structure

Weekly Lessons

This course is presented as a series of weekly modules. The course material is grouped in six modules. The seventh module represents the week of the Final Examination. Each of the Modules 1–6 will have two lectures, one case study, and a discussion topic.

Calendar Tool—You can add your own events there. However, please be aware that you may not find all of the important dates for the course listed there. You will stay current by checking on announcements, discussions, and emails in the course.
Readings—In this course there are both textbook readings and online lessons. Your professor may suggest additional readings during the running of the course.
Discussion —There may be threaded discussions throughout the course. These discussions are moderated by your instructor. Postings for each discussion should be completed by the assigned due dates. There are also general discussions boards, which are not graded, for you to use to discuss any issues with your classmates.

Assignments—There are assignments that are due throughout the courses. Please check the calendar for due dates.
Assessments/Quizzes—If there are quizzes they too will be listed in the course calendar. Be sure to check it to ensure that you complete them before the due date. Quizzes may be a combination of True/False and multiple choice questions.

Live Classrooms—Please see the Study Guide and/or Calendar for the dates and times of live classroom sessions.

Module 1 - Introduction to Biomedicine and the Role of IT

- Lecture One: Introduction to Biomedical Science
- Lecture Two: Introduction to Laboratory Medicine

Learning Objectives:

- The human body is made of systems and systems are made of organs that are interdependent. This interdependency is very finely balanced and requires constant data sampling of its environment and numerous feedback mechanisms.
- How things go wrong— genotype and phenotype polymorphism, stem cells and differentiation, developmental problems, the effects of aging, infectious disease, and cancer.
- The basis of measuring what is wrong when things go wrong—laboratory medicine, data generation and imaging enabling arrival at a diagnosis.
- The basics of health informatics
- The basics of healthcare system and the structure of the U.S. healthcare system
- The problems of and future challenges to the U.S. healthcare system

Module 2 - How we are structured: The Muscular, Skeletal, Skin, and Digestive Systems

- Lecture Three: Muscular, Skeletal, and Integumentary Systems
- Lecture Four: The Digestive System

Learning Objectives:

- General understanding of the structural organization of the human body and the functionality of the digestive system.
- Exploration of diagnostic methods and imaging procedures to identify disorders.
- The role of IT in data and image analysis, transfer and presentation.
- The Health Insurance Portability and Accountability Act of 1996 (HIPAA)

Module 3 - Energy, Energy Distribution and Product Disposal: the Cardiovascular and Respiratory Systems

- Lecture Five: The Cardiovascular System
- Lecture Six: The Pulmonary System

Learning Objectives:

- Basic understanding of the structure, function and interdependency of the heart and the lung functions.
- Basic comprehension of the multiple cardiovascular and respiratory regulatory checkpoints and how aberrations in a single functionality can cascade to generate a complex pathology.
- Appreciation of imaging techniques and therapeutic options available for diagnosing and treatment of cardiovascular and respiratory problems.
- The role and limitation of paper records
- Some considerations when implementing an IT system to replace paper forms
- Basics of Health Information Systems

Module 4 - The Nervous System and Immunity

- Lecture Seven: The Nervous System
- Lecture Eight: The Immune System

Learning Objectives:

- Recognition and understanding of the basic structure and functionality of the nervous system.
- An understanding of the pathophysiology of the nervous system together with common diagnostic methods and treatments
- An understanding of the development of the various cells of the blood, their relation to immunity, and to the established lymphoid structures including the lymphatics, lymph nodes, spleen, tonsils and thymus. The integration of the immune system with the barriers to the outside world: the skin, gut and respiratory epithelial lining.
- An understanding of the immune response to infection
- An understanding of the pathophysiology of the immune system together with common diagnostic methods and treatments
- Basic understanding of patient-facing software applications, such as personal health record

Module 5 - Renal, Urinary and Reproductive Systems, and Cancer

- Lecture Nine: The Renal and Urinary Systems
- Lecture Ten: Cancer

Learning Objectives:

- The structure, function and basic physiology of the renal and urinary systems
- Have a basic appreciation of the means to measure and image functions and pathologies of these systems
- An understanding of therapies available and possible medical interventions
- Understand the basics of how tumors arise: disposition and multi-step insults to the cell
- Identify common diagnostic methods, treatments, and procedures associated with these disorders
- Imaging techniques to aid differentiation of normal tissue from neoplastic tissue
- Various possible human errors in healthcare delivery process

Module 6 - The Endocrine System

- Lecture Eleven: The Endocrine System in control of reproduction and development
- Lecture Twelve: The Endocrine System in control of normal physiology

Learning Objectives:

- Recognition of the fundamental importance of endocrine messaging to every stage of human development, subsequent homeostasis and reproduction.
- An appreciation of cascading errors of varying severity depending upon the level at which an endocrine pathway is disturbed.
- Diagnostic assays to assess endocrine malfunctions; integration of physical changes and biochemical parameters to conclude a differential diagnosis
- Therapeutic options and measures of success

Module 7 - Final Exam

You will prepare for, and take, the proctored final exam.

The course will remain open two weeks after the final exam so that you can continue discussions and ask any questions about your grades or the course. This is also a time when we enter into a dialogue where we endeavor to learn from you how we can modify the course so that it better meets your needs.

Instructor

Derin Keskin, PhD

derinbenercikeskin@hotmail.com OR dbk1@bu.edu

Office hours by appointment

Dr. Derin Keskin received a Ph.D from Medical college of Georgia for Doctoral work in Immunology. He also holds a medical degree. Dr Keskin is a Research Scientist at the Broad Institute of Harvard and MIT, where he conducts cancer vaccine research. He has authored 50 peer-reviewed scientific journal publications. He also has multiple patents. He is an part-time Instructor at Harvard Medical School and Boston University. In Harvard Medical School, Dr. Keskin tutors first

year medical students in Anatomy, Physiology, Pathology, Microbiology and Infectious diseases.

Health Informatics Area Faculty Coordinator

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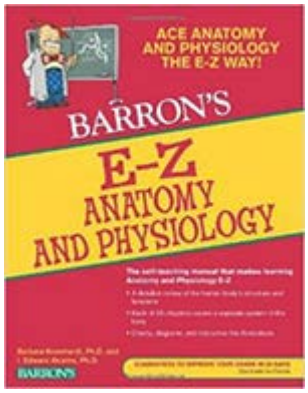
Office hours by appointment

Dr. Guanglan Zhang holds Masters degrees in Biomedical Engineering (M.Eng., Nanyang Technological University, Singapore) and Automatic Control Theory and Application (M.Eng., Northwestern Polytechnic University, China). She received a Ph.D. (Nanyang Technological University, Singapore) for doctoral work in bioinformatics. She is an Assistant Professor in Computer Science at Boston University Metropolitan College, where she teaches Health Informatics subjects and is a member of the Health Informatics Laboratory.

Dr. Zhang has worked in the biomedical informatics field since 1998. The most important aspects of her work include development and implementation of biomedical databases, computational simulations of laboratory experiments, development of diagnostic methods for tissue typing, and computational support for vaccine development. Computational tools that she developed are used in the study of immunology, vaccinology, infectious disease, and cancer. She has authored more than 40 peer-reviewed scientific journal publications and developed dozens of biomedical specialist databases and computational systems.

Resources

Required textbook



Edward Alcamo, Barbara Krumhardt. (2010) E-Z Anatomy and Physiology (Barron's E-Z Series). Barron's Educational Series; 3rd edition. ISBN-13: 978-0764144684

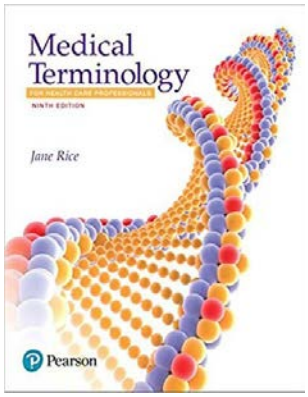
This textbook can be purchased from Barnes & Noble at Boston University.

Note: In the open-book final exam, only paper books and lecture notes are allowed. E-books are not allowed in the final exam. This book can also be downloaded from Amazon as a Kindle e-book. This e-book is recommended only if you have the Amazon Kindle Fire, the iPad running the Kindle App, or notebook PC or Mac running the Kindle application. Due to the color illustrations, this download is not recommended for monochrome tablets/e-readers.

Recommended textbook

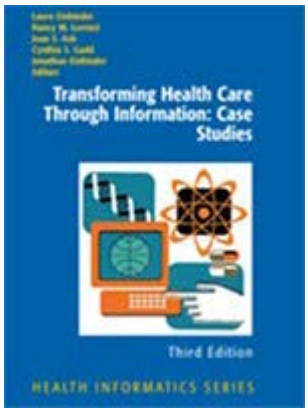
Trotter, F. and Uhlman, D. (2011). Hacking healthcare: A guide to standards, workflows, and meaningful use. O'Reilly Media. ISBN 9781449305024.

This textbook can be purchased from Barnes & Noble at Boston University.



Jane Rice. (2017) Medical Terminology for Health Care Professionals. 9th Edition. Pearson. ISBN 978-0134495347

This textbook can be purchased from Barnes & Noble at Boston University.



Einbinder L, Lorenzi NM, Ash J, Gadd CS, Einbinder J. (2010). Transforming Health Care Through Information: Case Studies. 3rd edition, Springer.

(Available electronically through BU library).

Other Materials

- Understanding Medical Words: A Tutorial from the National Library of Medicine
- Bernstam EV, Smith JW, Johnson TR. What is biomedical informatics? Journal of Biomedical Informatics 43 (2010) 104–110. (Available through PubMed).
- Davis K, Schoen C, Stremikis K. Mirror, Mirror on the Wall How the Performance of the U.S. Health Care System Compares Internationally, 2010 Update. Commonwealth Fund.
- Haux R. Health information systems—past, present, future. International Journal of Medical Informatics (2006) 75, 268-281. (Available through BU library).

- Reichertz P, Health information systems—past, present, future. International Journal of Medical Informatics (2006) 75, 282–299. (Available through BU library).
- Wager, K.A., Lee, F.W., and Glaser, J.P. (2013). Health Care Information Systems: A practical approach for health care management, 3rd edition. Jossey-Bass. (This is the required textbook for CS781 Advanced Health Informatics)

Boston University Library Information

Boston University has created a set of videos to help orient you to the online resources at your disposal. An introduction to the series is below:

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Download

All of the videos in the series are available on the Online Library Resources page, which is also accessible from the Campus Bookmarks section of your Online Campus Dashboard. Please feel free to make use of them.

As Boston University students you have full access to the BU Library. From any computer, you can gain access to anything at the library that is electronically formatted. To connect to the library use the link http://www.bu.edu/library.

Once in the library system, you can use the links under “Resources” and “Collections” to find databases, eJournals, and eBooks, as well as search the library by subject. Some other useful links include:

Go to http://www.bu.edu/library/research/collections to access eBooks and eJournals directly.

If you have questions about library resources, go to http://www.bu.edu/library/help/ask-a-librarian to email the library or use the live chat feature.

To locate course eReserves, go to http://www.bu.edu/library/services/reserves.

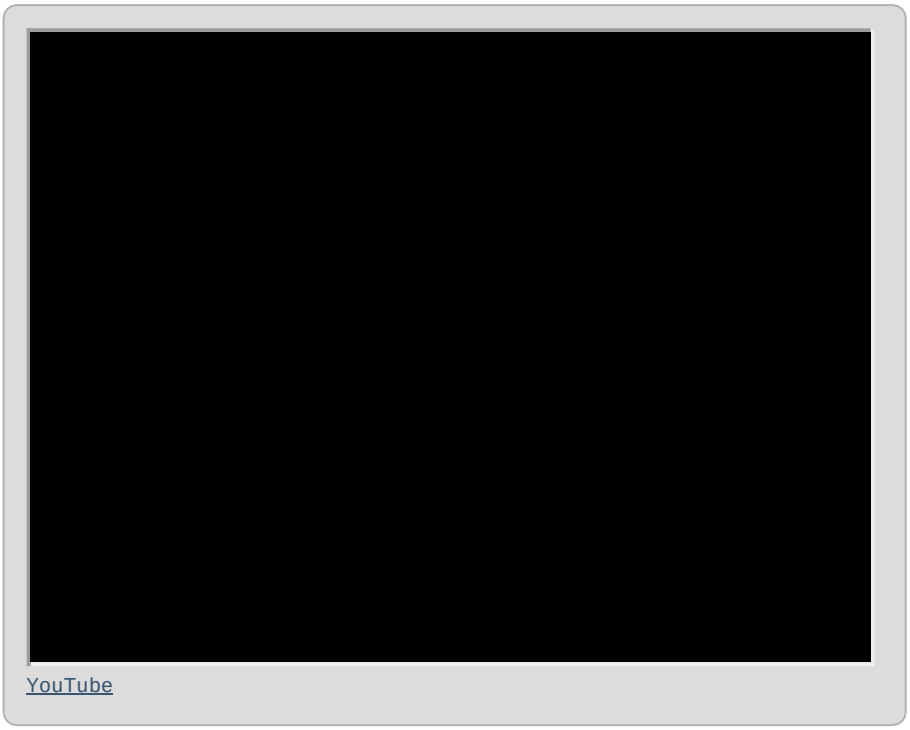
Please note that you are not to post attachments of the required or other readings in the water cooler or other areas of the course, as it is an infringement on copyright laws and department policy. All students have access to the library system and will need to develop research skills that include how to find articles through library systems and databases.

Free Tutoring Service

Free online tutoring with SMARTHINKING is available to BU online students for the duration of their courses. The tutors do not rewrite assignments, but instead teach students how to improve their skills in the following areas: writing, math, sciences, business, ESL, and Word/Excel/PowerPoint.

You can log in directly to SMARTHINKING from Online Campus by using the link in the left-hand navigation menu of your

course.



YouTube

Please Note

The SMARTHINKING service can be used for Boston University online class work only. Use of this service for personal purposes or for anything other than Boston University online class work will result in deactivation of your SMARTHINKING account.

Study Guide

Please allow 3-4 hours for every Live Classroom session. The sessions will be recorded and you can review them later at your convenience. E-mail your facilitator/Instructor if you have any questions.

Module 1 Study Guide and Deliverables

Readings:

Lecture Topics:

Lecture 01: Introduction to Biomedical Science

Lecture 02: Introduction to Laboratory Medicine

Recommended Reading (Trotter and Uhlman, 2011)

Chapter 2 An anatomy of medical practice.

United States Department of Labor, Bureau of Labor Statistics, Occupational Outlook Handbook, Healthcare Occupations

CRS Report for Congress, Government spending on Health Care, Benefits and

Programs: A Data Brief; Jennifer Jenson; June 16, 2008

The Structure and Funding of the U.S. Health Care System

OECD Health Statistics 2014 - How Does the United States Compare

OECD Health Statistics 2015 - How Does the United States Compare

2014 update, mirror, mirror on the wall: how the performance of the U.S. Health Care System compares internationally. The Commonwealth Fund

Discussions: Discussion 1 postings end Tuesday, September 12 at 6:00 AM ET

Assignments: Assignment 1 due Tuesday, September 12 at 6:00 AM ET

Assessments: Graded Quiz 1 due Tuesday, September 12 at 6:00 PM ET

Live Classrooms: Wednesday, September 6 at 8:00PM-9:30PM ET
Saturday, September 9 at 10:00AM-11:30PM ET

Module 2 Study Guide and Deliverables

Readings:

Lecture Topics:
Lecture 03: Muscular, Skeletal, and Integumentary Systems
Lecture 04: The Digestive System

Case Studies:

CS570-M1-CS01_Drolet.pdf
Scoliosis_NY_CaseStudy.pdf
Scoliosis_MGH_Boston_MA.pdf
Scoliosis_qa.pdf
Weiss_Scoliosis_2008.pdf

Course textbook: (Alcamo and Krumhardt, 2010)
Chapter 5: The Integumentary System
Chapter 6: Bones and Joints
Chapter 7: The Skeletal System
Chapter 8: Muscle Tissues
Chapter 9: The Muscles
Chapter 18: The Digestive System
Chapter 19: Metabolism and Nutrition

Recommended Reading: (Trotter and Uhlman, 2011)
Chapter 1 Introduction
Chapter 12 HIPAA: the far-reaching healthcare regulation

Additional material:
Understanding Health Information Privacy

HIPAA Business Associates: That was then, this is now

Exercises:
Grevitt_1997.pdf; Hoang-Kim-2011

Discussions: Discussion 2 postings end Tuesday, September 19 at 6:00 AM ET

Assignments: Assignment 2 due Tuesday, September 19 at 6:00 AM ET

Assessments: Graded Quiz 2 due Tuesday, September 19 at 6:00 PM ET

Live Classrooms: Wednesday, September 13 at 8:00PM-9:30PM ET
Saturday, September 16 at 10:00AM-11:30PM ET

Module 3 Study Guide and Deliverables

Readings:

Lecture Topics:
Lecture 05: The Cardiovascular System
Lecture 06: The Pulmonary System

Case Studies:

CS570-M3-CS01-McCormack.pdf
Science_Daily_2011.pdf
Carr_Chest_2012.pdf

Course textbook: (Alcamo and Krumhardt, 2010)
Chapter 15: The Cardiovascular System
Chapter 17: The Respiratory System

Recommended Reading: (Trotter and Uhlman, 2011)
Chapter 4: The bandwidth of paper.

Additional material:
Preventable adverse drug events and their causes and contributing factors: the analysis of register data. Jylhä V, Saranto K, Bates DW.. Int J Qual Health Care. 2011 Apr;23(2):187-97. (Jylha_IJQHC.pdf).

Voluntary electronic reporting of laboratory errors: an analysis of 37,532 laboratory event reports from 30 health care organizations. Snydman LK, Harubin B, Kumar S, Chen J, Lopez RE, Salem DN. Am J Med Qual. 2012 Mar-Apr;27(2):147-53. (Snydman_AJMQ.pdf) (BU library material)

Role of computerized physician order entry systems in facilitating medication errors. Koppel R, Metlay JP, Cohen A, Abaluck B, Localio AR, Kimmel SE, Strom BL. JAMA. 2005 Mar 9;293(10):1197-203. (Koppel_JAMA_2005.pdf)

National study on the frequency, types, causes, and consequences of voluntarily reported emergency department medication errors. Pham JC, Story JL, Hicks RW, Shore AD, Morlock LL, Cheung DS, Kelen GD, Pronovost PJ. J Emerg Med. 2011

May;40(5):485-92. (Pham_JEmMed_2011.pdf) (BU library material)

Discussions: Discussion 3 postings end Tuesday, September 26 at 6:00 AM ET

Assignments: Assignment 3 due Tuesday, September 26 at 6:00 AM ET

Assessments: Graded Quiz 3 due Tuesday, September 26 at 6:00 PM ET

Live Classrooms: Wednesday, September 20 at 8:00PM-9:30PM ET
Saturday, September 23 at 10:00AM-11:30PM ET

Module 4 Study Guide and Deliverables

Readings:

Lecture Topics:
Lecture 07: The Nervous System
Lecture 08: The Immune System

Case Study:

D1-Case_Study_Chapter_11.pdf

Course textbook: (Alcamo and Krumhardt, 2010)
Chapter 10: Nervous Tissue
Chapter 11: Nervous system Organization
Chapter 12: The Special Senses
Chapter 14: The Blood
Chapter 16: The Lymphatic and Immune Systems

Recommended Reading: (Trotter and Uhlman, 2011)
Chapter 6 Patient-facing software

Health Informatics:
R1-Inst_Med_reportbrief.pdf
R2-nationalqualitystrategy032011.pdf
R3-EightSuccessStories_092810.pdf

Nervous system:
L3-SC570-04-Maranhao-Filho_ArqNeuro_2009.pdf

Immune system:https://www.niaid.nih.gov/research/immune-system-research

Assignment:
A1-Todays_Hospitalist_Diagnostic_imaging_stroke.pdf
A2-telestroke_care.pdf
http://www.healthcare-informatics.com/news-item/telestroke-networks-can-be-cost-effective-hospitals

Exercises:
E1-Vaccines_Vac-Gen_How Vaccines Prevent Disease.pdf
E2-CDC-Influenza_Vaccine_Safety.pdf

E3-wer8730_vaccine_safety.pdf
E4-Thiomersal_controversy.pdf

Discussions: Discussion 4 postings end Tuesday, October 3 at 6:00 AM ET

Assignments: Assignment 4 due Tuesday, October 3 at 6:00 AM ET

Assessments: Graded Quiz 4 due Tuesday, October 3 at 6:00 PM ET

Live Classrooms: Wednesday, September 27 at 8:00PM-9:30PM ET
Saturday, September 30 at 10:00AM-11:30PM ET

Module 5 Study Guide and Deliverables

Readings:

Lecture Topics:
Lecture 09: The Renal, Urinary, and Reproductive Systems
Lecture 10: Cancer

Case study:

D1-Case_Study_Amata_Chapter_06.pdf

Course textbook: (Alcamo and Krumhardt, 2010)
Chapter 20: The Urinary System
Chapter 21: Fluid, Electrolyte, and Acid/Base Balance

Recommended Reading: (Trotter and Uhlman, 2011)
Chapter 7 Human Errors

Health informatics and drug adverse reactions:
Lecture material;
L3-Adler_JPtSaf_1208-2.pdf
L4-Classen_HealthAff_2011.pdf
L5-Goldman_Adverse_Event_Reporting_1996.pdf
L6-Kass_RIA1_2001.pdf

http://www.cancer.gov/cancertopics/cancerlibrary/what-is-cancer
http://www.cancer.gov/cancertopics

Discussions: Discussion 5 postings end Sunday, October 8 at 6:00 AM ET

Assignments: Assignment 5 due Sunday, October 8 at 6:00 AM ET

Assessments: Graded Quiz 5 due Sunday, October 8 at 6:00 PM ET

Live Classrooms: Wednesday, October 4 at 8:00PM-9:30PM ET
Saturday, October 7 at 10:00AM-11:30PM ET

Module 6 Study Guide and Deliverables

Readings:	**Course textbook**: (Alcamo and Krumhardt, 2010) recommended but not compulsory Chapter 7: The Endocrine System; Chapter 11: The Reproductive Organs; Chapter 12: Reproduction, Development and Birth. **Recommended Reading** (Trotter and Uhlman, 2011) Chapter 9 A selective history of EHR technology Hiller-Sturmhöfel S, Bartke A. The Endocrine System: An Overview. Alcohol Health and Research World. Vol. 22, No. 3, 1998 http://www.nlm.nih.gov/medlineplus/endocrinesystem.html Lecture 44 Christian Bartley (cbartley@nvcc.edu) Biology 101 & 102 - Class Notes - PowerPoint Presentation
Discussions:	No discussion this week
Assignments:	No assignments this week
Assessments:	No assessments this week
Live Classrooms:	Wednesday, October 11 at 8:00PM-9:30PM ET Saturday, October 14 at 10:00AM-11:30PM ET

Final Exam Details

The Final Exam is a proctored exam **available from October 18 at 6:00 AM ET to October 21 at 11:59 PM ET**. The Computer Science department requires that all final exams be proctored. You will receive a separate message about scheduling the time and location of the exam.

Grading Structure

The course material is grouped in six modules. The seventh module represents the week of the Final Examination. The first module contains two lectures and one case study. The materials covered in the first module will be used as reference in modules 2-6. Each of the Modules 2-6 will have one lecture, one case study, and discussion topics.

Reading materials—First module will have a selection of reading materials that will be referred to throughout the course. Modules 2–6 reading materials will involve one case study (from Einbinder) and one chapter (from Rice).

Hands-on Exercises—Set of exercises that need to be completed by students and submitted to instructors. They will be graded Pass/Fail.

Self-assessment Quizzes—There are 5 self-assessment quizzes that cover topics from the biomedical sciences related to the course material. SAQ will not be graded, but they are very important for understanding the assignment topics. Also, selected question from SAQs will be assessed on the final exam.

Graded Quizzes—There are four self-assessment quizzes that cover topics from the lecture materials.

Assignments—This course will have five graded assignments for modules 1–5.

Discussions—There may be threaded discussions for each individual module. These discussions are moderated by your instructor. Postings for each discussion should be completed by the assigned due dates. There are also general discussions boards, which are not graded, for you to use to discuss any issues with your classmates.

Final Examination—The final exam will be comprehensive and will cover material from the entire course. It will be an open-book proctored exam consisting of questions similar to the ones in the assignments.

The final grade for this course will be based on the following:

Assignments	30%
Graded Quizzes	25%
Weekly Discussions	10% (participation)
Final Exam	35%

Letter Grade

The final letter grade in the course will correspond approximately with the following numeric grade range:

A	94–100
A–	90–93
B+	86–89
B	81–85
B–	76–80
C+	71–75
C	66–70
C–	61–65
D	56–60
F	0–55

Course Policies

1. Attendance & Absences: Students are required to attend classes every week.
2. Assignment completion & late work:

    a. All assignments have to be submitted by the due dates. Each 24 hours of delay will result in 10% penalty.

    b. Graded Discussions need to be completed by the due date, which is one week after the beginning of the module. Each 24 hours of delay will result in 10% penalty.

    c. Quizzes need to be completed by the due date, which is one week after the beginning of the module. Each 24 hours of delay will result in 10% penalty.

3. Academic Conduct Code: http://www.bu.edu/met/for-students/met-policies-procedures-resources/academic-conduct-code/

Please note that this syllabus and course structure is subject to change, in which case announcements will be communicated to students.

Discussion Grading Rubric

Please check the calendar to find out the due dates for each posting in a graded discussion period. They are moderated by your facilitator and are graded.

You may be allowed to continue to post after that time but it will not be monitored and those additional postings will not count toward your discussion grade. You're certainly welcome to continue a discussion past the grading period, but that additional posted material will not affect your discussion grade. The discussion grading rubric below is the guide we use to evaluate your discussion contributions.

You will receive a grade and feedback for each of the chapter threads. There are also general discussions boards, which are not graded, for you to use to discuss any topics with your classmates and facilitators.

Please refer to the discussion rubric and netiquette pages before you participate.

Criteria	65–69	70–79	80–89	90–94	95–100
Participation	Very limited participation	Participation generally lacks frequency or relevance	Reasonably useful relevant participation during the discussion period	Frequently relevant and consistent participation throughout the discussion period	Continually relevant and consistent participation throughout the discussion period
Community	Mostly indifferent to discussion	Little effort to keep discussions going or	Reasonable effort to respond thoughtfully, provide help,	Often responds thoughtfully, in a way that frequently keeps	Continually responds thoughtfully in a way that

		provide help	and/or keep discussions going	discussions going and provides help	consistently keeps discussions going and provides help
Content	No useful, on-topic, or interesting information, ideas or analysis	Hardly any useful, on-topic, or interesting information, ideas or analysis	Reasonably useful, on-topic, and interesting information, ideas and/or analysis	Frequently useful, on-topic, and interesting information, ideas and analysis	Exceptionally useful, on-topic, and interesting information, ideas and analysis
Reflection and Synthesis			No significant effort to clarify, summarize or synthesize topics raised in discussions	Contributes to group's effort to clarify, summarize or synthesize topics raised in discussions	Leads group's effort to clarify, summarize or synthesize topics raised in discussions

Assignment Grading Rubric

Please refer to the discussion rubric and netiquette pages before you participate.

Criteria	65–69	70–79	80–89	90–94	95–100
Thoroughness & Coverage	Hardly covers any of the major relevant issues	Covers some of the major relevant issues	Reasonable coverage of the major relevant areas	Thorough coverage of almost all of the major relevant issues	Exceptionally thorough coverage of all major relevant issues
Depth, Understanding & Insight	Lack of understanding of, or lack of insight into material	Some understanding of material	Good overall understanding of material	Very good overall understanding of material, with some real depth	Excellent, deep understanding of material and its inter-relationships
Relevance & Significance	Focus is off topic or on insubstantial or secondary issues	Only some of the content is meaningful and on topic	Most or all of the content is reasonably meaningful and on-topic		
Persuasiveness	Disorganized	Some parts of	Generally	Exceptionally	

& Clarity	or hard-to-understand presentation	the presentation are disorganized or hard to understand	organized and clear	clear, organized and persuasive presentation of ideas	
Creativity & Innovativeness	Little significant or reasonably backed creative or innovative points-of-view or ideas	Few creative and innovative ideas or points-of-view that are reasonable & are backed by some analysis		Very good creative, and innovative ideas or points-of-view that are perceptive & are backed by strong analysis	Outstanding, creative, and innovative ideas or points-of-view that are perceptive & are backed by very strong analysis
Utilization of Source Materials	No useful references, or weak references with incorrect details or applicability	Weak use of source material and/or some details or applicability is incorrect	Some good references applied usefully	References indicate strong research used well	References indicate exceptional research used persuasively

If you have thoughtful questions about your instructor's evaluation, please discuss them with him or her in an academic manner. This can be an excellent opportunity to learn. If it is necessary for me to re-grade an assignment, I independently grade the entire assignment—not parts—using the criteria above.

Quiz Instructions

Accessing the Quiz

You will have access to the quiz at the beginning of the week. However you should not access the quiz until you have completed all learning activities for the week and are prepared to meet the objectives for that week. Check the calendar for the open and close dates of the quiz period. Please access your Quizzes by clicking on the Assessments tab in the left hand navigation.

Quiz Details

- The number of questions varies from quiz to quiz. You can access the quiz details from the assessments menu.
- The questions are multiple choice, True/False, and short essay.
- All questions are randomized.
- The points for each question are shown.
- The quiz questions will display one at a time on your screen.
- You may skip over questions and revisit them in any order.

- You will have enough time to complete the quiz, so that you aren't rushed.
- You can take a quiz only once.

Saving Answers

- To answer a multiple choice question, select the appropriate choice from the list below the question.
- When you have completed your response, click “Save Answer” at the top of the question.
- As you proceed through the exam, you can go back and edit previous responses that you saved.
- A timer is displayed above the questions tracking the remaining time available.
- You will see question number buttons above questions. You will need to click on “Question Completion Status” to see the question numbers. You can use these buttons to navigate from question to question at any time.
- When you have completed all answers, go to the last question of the exam and click the “Save and submit” button.

If a technical issue of any kind arises during the quiz requiring you to go beyond the time limit, complete the quiz answering the remaining questions and then contact your instructor immediately.

Other Questions

If you have any questions about the quiz please feel free to contact your instructor.

Technical Support

Experiencing issues with BU websites or Blackboard?

It may be a system-wide problem. Check the BU Information Services & Technology (IS&T) news page for announcements.

Boston University technical support via email (ithelp@bu.edu), the support form, and phone (888-243-4596) is available from 8 AM to midnight Eastern time. For other times, you may still submit a support request via email, phone, or the support form, but your question won't receive a response until the following day. If you aren't calling, it is highly recommended that you submit your support request via the technical-support form as this provides the IS&T Help Center with the best information in order to resolve your issue as quickly as possible.

Examples of issues you might want to request support for include the following:

- Problems viewing or listening to sound or video files
- Problems accessing internal messages
- Problems viewing or posting comments
- Problems attaching or uploading files for assignments or discussions

- Problems accessing or submitting an assessment

To ensure the fastest possible response, please fill out the online form using the link below:

Elive Service Team Support	
Email	elivesvc@bu.edu

Academic Conduct Policy

Please visit Metropolitan College's website for the full text of the department's *Academic Conduct Code*.

A Definition of Plagiarism

> "The academic counterpart of the bank embezzler and of the manufacturer who mislabels products is the plagiarist: the student or scholar who leads readers to believe that what they are reading is the original work of the writer when it is not. If it could be assumed that the distinction between plagiarism and honest use of sources is perfectly clear in everyone's mind, there would be no need for the explanation that follows; merely the warning with which this definition concludes would be enough. But it is apparent that sometimes people of goodwill draw the suspicion of guilt upon themselves (and, indeed, are guilty) simply because they are not aware of the illegitimacy of certain kinds of "borrowing" and of the procedures for correct identification of materials other than those gained through independent research and reflection."
>
> "The spectrum is a wide one. At one end there is a word-for-word copying of another's writing without enclosing the copied passage in quotation marks and identifying it in a footnote, both of which are necessary. (This includes, of course, the copying of all or any part of another student's paper.) It hardly seems possible that anyone of college age or more could do that without clear intent to deceive. At the other end there is the almost casual slipping in of a particularly apt term which one has come across in reading and which so aptly expresses one's opinion that one is tempted to make it personal property."
>
> "Between these poles there are degrees and degrees, but they may be roughly placed in two groups. Close to outright and blatant deceit-but more the result, perhaps, of laziness than of bad intent-is the patching together of random jottings made in the course of reading, generally without careful identification of their source, and then woven into the text, so that the result is a mosaic of other people's ideas and words, the writer's sole contribution being the cement to hold the pieces together. Indicative of more effort and, for that reason, somewhat closer to honest, though still dishonest, is the paraphrase, and abbreviated (and often skillfully prepared) restatement of someone else's analysis or conclusion, without acknowledgment that another person's text has been the basis for the recapitulation."

The paragraphs above are from H. Martin and R. Ohmann, *The Logic and Rhetoric of Exposition, Revised Edition.* Copyright 1963, Holt, Rinehart and Winston.

Academic Conduct Code

I. Philosophy of Discipline

The objective of Boston University in enforcing academic rules is to promote a community atmosphere in which learning can best take place. Such an atmosphere can be maintained only so long as every student believes that his or her academic competence is being judged fairly and that he or she will not be put at a disadvantage because of someone else's dishonesty. Penalties should be carefully determined so as to be no more and no less than required to maintain the desired atmosphere. In defining violations of this code, the intent is to protect the integrity of the educational process.

II. Academic Misconduct

Academic misconduct is conduct by which a student misrepresents his or her academic accomplishments, or impedes other students' opportunities of being judged fairly for their academic work. Knowingly allowing others to represent your work as their own is as serious an offense as submitting another's work as your own.

III. Violations of this Code

Violations of this code comprise attempts to be dishonest or deceptive in the performance of academic work in or out of the classroom, alterations of academic records, alterations of official data on paper or electronic resumes, or unauthorized collaboration with another student or students. Violations include, but are not limited to:

A. **Cheating on examination**. Any attempt by a student to alter his or her performance on an examination in violation of that examination's stated or commonly understood ground rules.

B. **Plagiarism.** Representing the work of another as one's own. Plagiarism includes but is not limited to the following: copying the answers of another student on an examination, copying or restating the work or ideas of another person or persons in any oral or written work (printed or electronic) without citing the appropriate source, and collaborating with someone else in an academic endeavor without acknowledging his or her contribution. Plagiarism can consist of acts of commission-appropriating the words or ideas of another-or omission failing to acknowledge/document/credit the source or creator of words or ideas (see below for a detailed definition of plagiarism). It also includes colluding with someone else in an academic endeavor without acknowledging his or her contribution, using audio or video footage that comes from another source (including work done by another student) without permission and acknowledgement of that source.

C. **Misrepresentation or falsification of data** presented for surveys, experiments, reports, etc., which includes but is not limited to: citing authors that do not exist; citing interviews that never took place, or field work that was not completed.

D. **Theft of an examination**. Stealing or otherwise discovering and/or making known to others the contents of an examination that has not yet been administered.

E. **Unauthorized communication during examinations**. Any unauthorized communication may be considered prima facie evidence of cheating.

F. **Knowingly allowing another student to represent your work as his or her own**. This includes providing a copy of your paper or laboratory report to another student without the explicit permission of the instructor(s).

G. **Forgery, alteration, or knowing misuse of graded examinations, quizzes, grade lists, or official records of documents**, including but not limited to transcripts from any institution, letters of recommendation, degree certificates, examinations, quizzes, or other work after submission.

H. **Theft or destruction of examinations or papers** after submission.

I. **Submitting the same work in more than one course** without the consent of instructors.

J. **Altering or destroying another student's work or records**, altering records of any kind, removing materials from libraries or offices without consent, or in any way interfering with the work of others so as to impede their academic performance.

K. **Violation of the rules governing teamwork**. Unless the instructor of a course otherwise specifically provides instructions to the contrary, the following rules apply to teamwork: 1. No team member shall intentionally restrict or inhibit another team member's access to team meetings, team work-in-progress, or other team activities without the express authorization of the instructor. 2. All team members shall be held responsible for the content of all teamwork submitted for evaluation as if each team member had individually submitted the entire work product of their team as their own work.

L. **Failure to sit in a specifically assigned seat during examinations.**

M. **Conduct in a professional field assignment that violates the policies and regulations of the host school or agency.**

N. **Conduct in violation of public law occurring outside the University that directly affects the academic and professional status of the student, after civil authorities have imposed sanctions.**

O. **Attempting improperly to influence the award of any credit, grade, or honor.**

P. **Intentionally making false statements to the Academic Conduct Committee or intentionally presenting false information to the Committee.**

Q. **Failure to comply with the sanctions imposed under the authority of this code.**

Important Message on Final Exams

Dear Boston University Computer Science Online Student,

As part of our ongoing efforts to maintain the high academic standard of all Boston University programs, including our online MSCIS degree program, the Computer Science Department at Boston University's Metropolitan College requires that each of the online courses includes a proctored final examination.

By requiring proctored finals, we are ensuring the excellence and fairness of our program. The final exam is administered online, and the access will be available at the exam sites.

Specific information regarding final-exam scheduling will be provided approximately two weeks into the course. This early notification is being given so that you will have enough time to plan for where you will take the final exam.

I know that you recognize the value of your Boston University degree and that you will support the efforts of the University to maintain the highest standards in our online degree program.

Thank you very much for your support with this important issue.

Regards,

Professor Lou Chitkushev, Ph.D.
Associate Dean for Academic Affairs
Boston University Metropolitan College

Who's Who: Roles and Responsibilities

You will meet many BU people in this course and program. Some of these people you will meet online, and some you will

communicate with by email and telephone. There are many people behind the scenes, too, including instructional designers, faculty who assist with course preparation, and video and animation specialists.

People in Your Online Course in Addition to Your Fellow Students

Your Facilitator. Our classes are divided into small groups, and each group has its own facilitator. We carefully select and train our facilitators for their expertise in the subject matter and their excellence in teaching. Your facilitator is responsible for stimulating discussions in pedagogically useful areas, for answering your questions, and for grading homework assignments, discussions, term projects, and any manually graded quiz or final-exam questions. If you ask your facilitator a question by email, you should get a response within 24 hours, and usually faster. If you need a question answered urgently, post your question to one of the urgent help topics, where everyone can see it and answer it.

Your Professor. The professor for your course has primary responsibility for the course. If you have any questions that your facilitator doesn't answer quickly and to your satisfaction, then send your professor an email in the course, with a cc to your facilitator so that your facilitator is aware of your question and your professor's response.

Your Senior Faculty and Student Support Administrator, Jennifer Sullivan. Jen is here to ensure you have a positive online experience. You will receive emails and announcements from Jen throughout the semester. Jen represents Boston University's university services and works for the Office of Distance Education. She prepares students for milestones such as course launch, final exams, and course evaluations. She is a resource to both students and faculty. For example, Jen can direct your university questions and concerns to the appropriate party. She also handles general questions regarding Online Campus functionality for students, faculty, and facilitators, but she does not provide tech support. She is enrolled in all classes and can be contacted within the course through Online Campus email as it is running. You can also contact her by external email at jensul@bu.edu or call toll free at 1-888-524-2200.

People Not in Your Online Course

Although you will not normally encounter the following people in your online course, they are central to the program. You may receive emails or phone calls from them, and you should feel free to contact them.

Your Computer Science Department Online Program Coordinator, Peter Mirza. Peter administers the academic aspects of the program, including admissions and registration. You can ask him questions about the program, registration, course offerings, graduation, or any other program-related topic. He can be reached at metcsol@bu.edu or (617) 353-2566.

Your Computer Science Department Program Manager, Kim Richards. Kim is responsible for administering most aspects of the Computer Science Department. You can reach Kim at kimrich@bu.edu or (617) 353-2566.

Andrew Gorlin, Academic Advisor. Reviews requests for transfer credits and waivers and advises students on which courses to take to meet their career goals. He can be reached at asgorlin@bu.edu.

Your Faculty Coordinator of the MSCIS Online Program, Andrew Wolfe. Andrew is responsible for the MSCIS online program. Feel free to contact him at awolfe@bu.edu or (617) 358-1984.

Professor Anatoly Temkin, Computer Science Department Chairman. You can reach Professor Temkin at

temkin@bu.edu or at 617-353-2566.

Professor Lou T. Chitkushev, Associate Dean for Academic Affairs, Metropolitan College. Dr. Chitkushev is responsible for the academic programs of Metropolitan College. Contact Professor Chitkushev with any issues that you feel have not been addressed adequately. The customary issue-escalation sequence after your course facilitator and course faculty is Andrew Wolfe, then Professor Temkin, and then Professor Chitkushev.

Professor Tanya Zlateva, Metropolitan College Dean Dr. Zlateva is responsible for the quality of all the academic programs at Boston University Metropolitan College.

Disability Services

In accordance with University policy, every effort will be made to accommodate unique and special needs of students with respect to speech, hearing, vision, or other disabilities. Any student who feels he or she may need an accommodation for a documented disability should contact the Office of Disability Services at (617) 353-3658 or at access@bu.edu for review and approval of accommodation requests.

Netiquette

The Office of Distance Education has produced a netiquette guide to help you understand the potential impact of your communication style.

Before posting to any discussion forum, sending email, or participating in any course or public area, please consider the following:

Ask Yourself...

- How would I say this in a face-to-face classroom or if writing for a newspaper, public blog, or wiki?
- How would I feel if I were the reader?
- How might my comment impact others?
- Am I being respectful?
- Is this the appropriate area or forum to post what I have to say?

Writing

When you are writing, please follow these rules:

- **Stay polite and positive in your communications**. You can and should disagree and participate in discussions with vigor; however, when able, be constructive with your comments.
- **Proofread your comments before you post them.** Remember that your comments are permanent.
- **Pay attention to your tone.** Without the benefit of facial expressions and body language your intended tone or the meaning of the message can be misconstrued.
- **Be thoughtful and remember that classmates' experience levels may vary.** You may want to include background information that is not obvious to all readers.
- **Stay on message.** When adding to existing messages, try to maintain the theme of the comments previously posted. If you want to change the topic, simply start another thread rather than disrupt the current conversation.
- **When appropriate, cite sources.** When referencing the work or opinions of others, make sure to use correct citations.

Reading

When you are reading your peers' communication, consider the following:

- **Respect people's privacy.** Don't assume that information shared with you is public; your peers may not want personal information shared. Please check with them before sharing their information.
- **Be forgiving of other students' and instructors' mistakes.** There are many reasons for typos and misinterpretations. Be gracious and forgive other's mistakes or privately point them out politely.
- **If a comment upsets or offends you, reread it and/or take some time before responding.**

Important Note

Don't hesitate to let your instructor or your faculty and student support administrator know if you feel others are inappropriately commenting in any forum.

All Boston University students are required to follow academic and behavioral conduct codes. Failure to comply with these conduct codes may result in disciplinary action.

Registration Information and Important Dates

View the drop dates for your course.

Withdraw or drop your course.

- If you are dropping down to zero credits for a semester, please contact your college or academic department.
- **Nonparticipation in your online course does not constitute a withdrawal from the class.**
- If you are unable to drop yourself on student link please contact your college or academic department.

Technical Support

Experiencing issues with BU websites or Blackboard?

It may be a system-wide problem. Check the BU Information Services & Technology (IS&T) news page for announcements.

Boston University technical support is available via email (ithelp@bu.edu), the support form, and phone (888-243-4596). Please note that the IT Help Center has multiple locations. All locations can be reached through the previously mentioned methods. For IT Help Center hours of operation please visit their contact page. For other times, you may still submit a support request via email, phone, or the support form, but your question won't receive a response until the following day. If you aren't calling, it is highly recommended that you submit your support request via the technical-support form as this provides the IS&T Help Center with the best information in order to resolve your issue as quickly as possible.

Examples of issues you might want to request support for include the following:

- Problems viewing or listening to sound or video files
- Problems accessing internal messages
- Problems viewing or posting comments
- Problems attaching or uploading files for assignments or discussions
- Problems accessing or submitting an assessment

To ensure the fastest possible response, please fill out the online form using the link below:

IT Help Center Support
888-243-4596 or local 617-353-4357 or Web
Check your open tickets using BU's ticketing system.

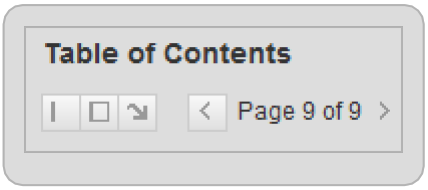
Navigating Courses

For best results when navigating courses, it is recommended that you use the Mozilla Firefox browser.

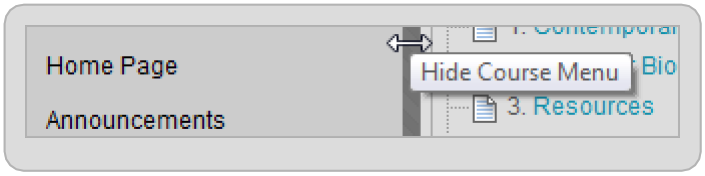
The Table of Contents may contain folders. These folders open and close (+ and – signs) and may conceal some pages. To avoid missing content pages, you are advised to use the next- and previous-page buttons (and icons) in the top-right corner of the learning content.

Please also familiarize yourself with the navigation tools, as shown below; these allow you to show and hide both the Course Menu and the Table of Contents on the left. This will be helpful for freeing up screen space when moving through the weekly lecture materials.

Navigation tools for the Table of Contents are shown in the image below:



Clicking on the space between the Course Menu and the Table of Contents allows you to show or hide the Course Menu on the left:



Web Resources/Browser Plug-Ins

To view certain media elements in this course, you will need to have several browser plug-in applications installed on your computer. See the Course Resources page in the syllabus of each individual course for other specific software requirements.

- Check your computer's compatibility by reviewing Blackboard's System Requirements
- Check your browser settings with Blackboard's Connection Test
- Download most recent version of Adobe Flash Player
- Download most recent version of Adobe Acrobat Reader

How to Clear Your Browser Cache

The IT Help Center recommends that you periodically clear your browser cache to ensure that you are viewing the most current content, particularly after course or system updates.

This page is also found within the "How to..." section of the online documentation, which contains a list of some of the most common tasks in Blackboard Learn.

Boston University Metropolitan College