Northeastern College of Engineering

INFO 5100 – APPLICATION ENGINEERING DEVELOPMENT]
[FALL 2024]

Instructor Information
Full Name: Suhabe Bugrara
Email Address: sbugrara@northeastern.edu

Instructor Biography
Dr. Suhabe Bugrara received a Ph.D. in computer science from Stanford University and B.Sc. from MIT. He has published in top academic conferences in operating systems, computer security, and software engineering. He is currently a founder of a blockchain security startup. Previously, he was a security researcher at ConsenSys focusing on the Ethereum virtual machine. Before that, he was founder of Wise OR, a software startup in Silicon Valley focusing on optimizing the profitability of surgical cases at world-class hospitals.

Course Prerequisites
None

Course Description
The primary objectives of this course are to practice social-technical software engineering techniques to solve real-world business problems. Students will be equipped with practical design and programming techniques for the purpose of building significant business applications quickly. In a step-by-step manner, the instructor will take you through the process of systematically combining UX techniques, business processes, and complex data models to assemble designs that are user friendly and meet business requirements. You will learn how to employ systems thinking, the object-oriented paradigm, visual user interface design principles, the visual Programming technique, as well as productivity tools to put together complicated, powerful designs. We will practice simple and smart ways of making software programming enjoyable.

Course Learning Outcomes

Students will learn how to build models that represent the full functionality of software applications. The modularity principle will be used to build powerful models that lend themselves to specifications for software implementation. In addition, the student will learn basic programming techniques to prepare them for INFO 5100 and other technical courses. Overall, the class will teach the students how to be a functional architect and take the lead in using software to drive innovative solutions to business problems, in healthcare, financial, as well as other social challenges.

Course Schedule/Topics Covered.

Week	Date	In Class Topic	Assignment Due

1	09/04	Introduction to the course: Socio-technical engineering and Ecosystem Design. Functional vs Component Structures. Program structure, JVM, compilation steps.	SDK and NetBeans installation. Extended lab with additional class attributes.
2	09/11	Creating and displaying multiple objects. Java syntax, class files, classes, objects, attributes, methods.	Implement Model relationships in java as complete app. Extend the lab with more attributes.
3	09/18	User Interaction Designs. Data types, integers, strings, primitive types, variables vs values, reference variables, memory usage.	User flows as screen navigation flows using the card layout in java, passing objects between screens. Extend the lab with additional screens and user flows.
4	09/25	Modelling the supply side. Functions and methods, parameter passing in java.	Finding bugs and learning how to use the debugger, Write a program with bugs and show how you isolate the problem. Prepare a report.
5	10/2	Designing the person (subject and user) into the application. Program control flow, alternate routes and execution paths, Boolean variables, conditional statements, if statements.	Implement the login process using person and user account directories. Show how to save the hash of the password as part of the user account.
6	10/9	Order Processing Design and model comparison. Simple arrays, while and for loops.	
7	10/16	Digital marketing, customization and targeting. Introduction to the java collection API	
8	10/23	Digital Ecosystem models. Final Project Announcement, Midterm Exam. Introduction to data structures – stacks and queues with applications.	
9	10/30	Ecosystem design techniques Part 1. Memory management and garbage collection in java	
10	11/6	Ecosystem design Part 2. Advanced collection.	
11	11/13	Final Project Status check	

12	11/20	**Advanced Topics**	
13	11/27	**Advanced Topics**	
14	12/4	**Final Project Submission**	
15	12/11	**Final Project Presentation**	

Assignment Grading

- Attendance – 10 %
- Assignment and Lab – 25%
- Quizzes – 25 %
- Final Project – 40 %

Grading Scale

	87-89.9% B+	77-79.9% C+	
	84-86.9% B	74-76.9% C	
95-100% A			
90-94.9% A-	80-83.9%B-	70-73.9% C-	
			69.9% or below F

Attendance/Late Work Policy

Attendance Policy

Students registered in MGEN courses (INFO, CSYE, and DAMG) are allowed **a maximum of 2 absences per course, with 3 or more absences resulting in an automatic 'F' for that course.** Students are expected to inform their instructors of any absences in advance of the class; if a student is sick long-term or experiences a medical issue that prevents class attendance, it is strongly encouraged that they speak with their Academic Advisor (coe-mgen-gradadvising@northeastern.edu) to learn more about the Medical Leave of Absence. Should a student anticipate being unable to attend 3 or more classes, they should discuss their situation with their Academic Advisor to explore other types of leave in accordance with the University's academic and global entry expectations. International students should review the Office of Global Services webpage to understand their visa compliance requirements.

Teaching Assistants (TAs) or Instructional Assistants (IAs) will be present at each class to collect student attendance.

Late Work Policy

Students must submit assignments by the deadline in the time zone noted in the syllabus. Students must communicate with the faculty prior to the deadline if they anticipate work will be submitted late. Work submitted late without prior communication with faculty will not be graded.

End-of-Course Evaluation Surveys
Your feedback regarding your educational experience in this class is particularly important to the College of Engineering. Your comments will make a difference in the future planning and presentation of our curriculum.

At the end of this course, please take the time to complete the evaluation survey at **https://neu.evaluationkit.com**. Your survey responses are **completely anonymous and confidential**. For courses 6 weeks in length or shorter, surveys will be open one week prior to the end of the courses; for courses greater than 6 weeks in length, surveys will be open for two weeks. An email will be sent to your Northeastern University Mail account notifying you when surveys are available.

Academic Integrity
A commitment to the principles of academic integrity is essential to the mission of Northeastern University. The promotion of independent and original scholarship ensures that students derive the most from their educational experience and their pursuit of knowledge. Academic dishonesty violates the most fundamental values of an intellectual community and undermines the achievements of the entire University.

As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, examinations of whatever kind, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Students are responsible for learning the conventions of documentation and acknowledgment of sources in their fields. Northeastern University expects students to complete all examinations, tests, papers, creative projects, and assignments of any kind according to the highest ethical standards, as set forth either explicitly or implicitly in this Code or by the direction of instructors.

Go to http://www.northeastern.edu/osccr/academic-integrity-policy/ to access the full academic integrity policy.

MGEN Student Feedback
Students who would like to provide the MGEN unit with anonymous feedback on this particular course, Teaching Assistants, Instructional Assistants, professors, or to provide general feedback regarding their program, may do so using this survey: https://neu.co1.qualtrics.com/jfe/form/SV_cTIAbH7ZRaaw0Ki

University Health and Counseling Services
As a student enrolled in this course, you are fully responsible for assignments, work, and course materials as outlined in this syllabus and in the classroom. Over the course of the semester if you experience any health issues, please contact UHCS.

For more information, visit https://www.northeastern.edu/uhcs.

Student Accommodations
Northeastern University and the Disability Resource Center (DRC) are committed to providing disability services that enable students who qualify under Section 504 of the Rehabilitation Act and the Americans with Disabilities Act Amendments Act (ADAAA) to participate fully in the activities of the university. To receive accommodations through the DRC, students must provide appropriate documentation that demonstrates a current substantially limiting disability.

For more information, visit https://drc.sites.northeastern.edu.

Library Services
The Northeastern University Library is at the hub of campus intellectual life. Resources include over 900,000 print volumes, 206,500 e-books, and 70,225 electronic journals.

For more information and for education specific resources, visit https://library.northeastern.edu
Network Campus Library Services: Northeastern University Library Global Campus Portals

24/7 Canvas Technical Help
For immediate technical support for Canvas, call 617-373-4357 or email help@northeastern.edu

Canvas Student Resources: https://canvas.northeastern.edu/student-resources/

For assistance with my Northeastern e-mail, and basic technical support:
Visit ITS at https://its.northeastern.edu
Email: help@northeastern.edu
ITS Customer Service Desk: 617-373-4357

Diversity and Inclusion
Northeastern University is committed to equal opportunity, affirmative action, diversity, and social justice while building a climate of inclusion on and beyond campus. In the classroom, members of the University community work to cultivate an inclusive environment that denounces discrimination through innovation, collaboration, and an awareness of global perspectives on social justice.

Please visit http://www.northeastern.edu/oidi/ for complete information on Diversity and Inclusion

Title IX
Title IX of the Education Amendments of 1972 protects individuals from sex or gender-based discrimination, including discrimination based on gender-identity, in educational programs and activities that receive federal financial assistance.

Northeastern's Title IX Policy prohibits Prohibited Offenses, which are defined as sexual harassment, sexual assault, relationship or domestic violence, and stalking. The Title IX Policy applies to the entire community, including male, female, transgender students, faculty, and staff.

In case of an emergency, please call 911.

*Please visit **https://www.northeastern.edu/ouec** for a complete list of reporting options and resources both on- and off-campus.*