



INFO 5100 & 5101: Application Engineering and Development & its Lab

Course Information

Course Title: Application Engineering and Development & its Lab

Course Number: INFO 5100-15 & INFO 5101-20

Term and Year: Fall 2024

Credit Hour: 4

CRN: 20822

Course Format: On-Ground

Timing: Wednesday's 2:00-5:20 pm PST.

Lecture location: 1515 (Vancouver Campus)

Instructor Information

Full Name: Rushdi Alsaleh, PhD

Email Address: r.alsaleh@northeastern.edu

Office Hours: On-campus:

Wed 12-2 pm

Thursday 12-1:30 pm

Friday 4:30-5:30 pm

Or

Online through the link:

<https://calendly.com/ralsaleh/15-min-gn>

on Monday's and Tuesday's

Or

Anytime by appointment

Instructor Biography

Professor of Data Science, and Artificial Intelligence, with more than 12 years of experience in the industry and has led multiple high-impact data-driven projects with local and global companies.

Teaching Assistant Information

Full Name: Akash Bahri

Email Address: bahri.a@northeastern.edu

Office Hours: TBD

Course Prerequisites

Please consult school listings for prerequisites.

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

- 1) Apply Social-Technical Software Engineering Techniques: Students will be able to practice and implement social-technical software engineering methods and tools to analyze and solve real-world business problems across various domains.
- 2) Design and Implement Software Applications: Students will be able to innovate design and utilize programming techniques to rapidly build significant business applications.
- 3) Acquire Foundational Programming Skills: Students will develop foundational programming skills to be able to design, develop, and debug applications using core Java programming concepts such as object-oriented programming, data structures, and exception handling.

An Interactive Setting

Besides the lectures, the class will have lab sessions, which will permit continuous interaction. The time will be divided into lecture, lab, help sessions; students will engage in hands-on design and application modeling under instructor supervision. For the duration of the class, we will focus on a single business problem – you will focus on one problem for the entire semester and that you will start small and gradually expand the scope. Students will practice the art of how to break down business requirements into small manageable components, program the components, and assemble those components into useful designs.

Our Approach

Students will select a practical business problem and articulate its underlying user requirements. They will engineer an information model capturing the important aspects of the business problem and define the business processes necessary to deliver the solution that will satisfy the stated business requirements as well as define the user tasks as screen designs. We will work on identifying and incorporating the information needed for the task (screen) at hand. The information model will be linked to user screens through input and output flows and data transformation.

Required Tools and Course Textbooks.

The class will use visual programming tools like scratch and NetBeans for basis programming and form design.

Recommended Textbooks:

Big Java: Early Objects, 7th Edition Cay S. Horstmann. 2018. ISBN: 978-1-119-49909-1

Object-Oriented Software Engineering Using UML, Patterns, and Java, 3rd edition. 2010. Bernd BrueggeAllen H. Dutoit. Pearson

Starting out with Java, From Control Structure through Objects. 8th edition. Tony Gaddis. 2022.

Course Schedule/Topics Covered (Tentative).

Week	Date	In Class Topic	Lab Work	Assignment Due
1	09/04	Java Fundamentals	JDK and NetBeans installations. Intro to Java Java syntax, Data types, integers, strings, primitive types, Variables vs values, reference variables, memory usage.	
2	09/11	Data Structures	Program control flow, alternate routes, and execution paths, Boolean variables, conditional statements, if statements, for and while loops	Assignment 1
3	09/18	Object-oriented Programming - 1	Class files, classes, objects, attributes, functions and methods	
4	09/25	Object-oriented programming - 2	Inheritance , polymorphism, etc	Assignment 2
5	10/2	Exception Handling and Testing, JavaDoc	Exception handling and testing, JavaDoc	Assignment 3
6	10/9	Exception Handling and Testing, JavaDoc (contd) Midterm Revision	Exception Handling and Testing, JavaDoc (contd) Midterm revision	
7	10/16	Midterm Exam	Introduction to advanced data structures: stacks, queues and Hashmap with applications	
8	10/23	UML Diagrams	Introduction to advanced data	Assignment 4

			structures: stacks, queues and Hashmap with applications (contd)	
9	10/30	Graphical Applications	Java swing	
10	11/6	Graphical Applications - 2	Advanced Java swing	
11	11/13	Exceptions and Advanced File I/O, Multithreading Case Studies	Application of I/O and Multithreading in Java	Assignment 5
12	11/20	Database	Mysql connection and basic programs	
13	11/27	Advanced Topics	Lab for advanced topics	
14	12/4	Final Project Presentation		
15	12/11	Final Project Presentation		

Assignment Grading

Please insert all assignment grades and weights for the course. Example below:

- Attendance – 10 %
- Assignments and Labs – 25%
- Midterm Exam – 25%
- Final Project – 40%

Grading Scale

	87-89.9% B+	77-79.9% C+	
95-100% A	84-86.9% B	74-76.9% C	
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_cTIAbH7ZRaaaw0Ki

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/uhrs>.

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.