RUTGERS
UNIVERSITY | NEWARK

SOFTWARE ENGINEERING

21:198:490 (3 credits)

COURSE DESCRIPTION

Software systems are built to perform a variety of tasks. This course covers the fundamentals of software systems functional requirements analysis, design, development, testing, integration, implementation, operation and maintenance. Students, through course projects, will participate in the systems analysis, design and development process, teamwork is emphasized.

COURSE OBJECTIVES

Upon successful completion of this course, students should have an understanding of the following:

- Foundations for Software Systems Development
- Software Systems Planning and Selection
- Software Systems Analysis and Design
- Software Systems Implementation, Testing and Operation

PREREQUISITE

(21:198:280 Programming Language Concepts) and (21:198:288 Intensive Programming in Linux)

TEXTBOOK

Software Engineering, 10th Edition, Ian Sommerville, University of Lancaster, United Kingdom, University of St Andrews, Scotland.
Publisher's website: https://www.pearson.com/us/higher-education/program/Sommerville-Software-Engineering-10th-Edition/PGM35255.html

Systems Analysis and Design, 12th Edition, Scott Tilley, Cengage, ISBN-13: 978-0357117811
Publisher's website: https://www.cengage.com/c/systems-analysis-and-design-12e-tilley/9780357117811PF/

SUPPLENENTAL TEXTBOOKS

Object-Oriented Software Engineering Using UML, Patterns, and Java, Third Edition
Authors: Bernd Bruegge, Allen H. Dutoit, ISBN-13: 9780136061250
Publisher's website: https://www.pearson.com/us/higher-education/program/Bruegge-Object-Oriented-Software-Engineering-Using-UML-Patterns-and-Java-3rd-Edition/PGM58934.html

App Development with Swift, by Apple Education. A free Apple eBook downloadable to Mac and iOS devices from Apple Books at https://books.apple.com/us/book/app-development-with-swift/id1219117996

Android How to Program, 3rd Edition, Harvey Deitel, Deitel & Associates, Inc., 2017. ISBN-13: 978-0134444307, ISBN-10: 9780134444307
Publisher's website: https://www.pearson.com/us/higher-education/program/Deitel-Android-How-to-Program-3rd-Edition/PGM334399.html

RECOMMENDED SOFTWARE

1. Latest version of **Java Development Kit**
   The Java website www.oracle.com may require a username and password to download Java.
2. **Android Studio:** An Integrated Development Environment for developing and running Android Mobile Application Projects. Android Studio can be downloaded from https://developer.android.com/studio, after download is complete, run its setup file to install.
3. **Xcode IDE:** Require a Mac OS based computer and a free Apple ID or an Apple Developer ID to download, install and run. Publishing iOS apps to App Store may require Apple Developer ID. Xcode IDE is freely available for download and install on a Mac computer, please visit https://developer.apple.com/xcode/ or search for "Xcode" app on Apple App Store to download and install.
4. **Microsoft Visual Studio:** Downloadable at https://visualstudio.microsoft.com
5. **Python:** Downloadable at https://www.python.org/
6. Any other recommended software.

SUPPLEMENTARY READINGS

Any and all other additional materials, or means by which to obtain these materials, will be physically or electronically provided to you by your instructor.

Java Documentation
Documentation for Android App Developers
Apple Developer Documentation

FINAL EXAM

Date and time according to Academic Calendar.
Location: Classroom

DEPARTMENT WEBSITE

Mathematics & Computer Science | Rutgers SASN

TENTATIVE COURSE TOPICS

Chapter 1– Introduction
Chapter 2 – Software Processes

Chapter 3 – Agile Software Development
Chapter 4 – Requirements Engineering
Chapter 5 – System Modeling
Chapter 6 – Architectural Design
Chapter 7 – Design and Implementation
Chapter 8 – Software Testing
Chapter 9 – Software Evolution
Chapter 10 – Dependable systems
Chapter 11 – Reliability Engineering
Chapter 12 – Safety Engineering
Chapter 13 – Security Engineering
Chapter 14 – Resilience Engineering
Chapter 15 – Software Reuse
Chapter 16 - Component-based software engineering
Chapter 17 – Distributed software engineering
Chapter 18 – Service-oriented Software Engineering
Chapter 19 – Systems Engineering
Chapter 20 – Systems of Systems
Chapter 21– Real-time Software Engineering
Chapter 22 – Project Management
Chapter 23 – Project planning
Chapter 24 - Quality Management
Chapter 25 – Configuration Management

GRADING

90 and above:	**A**
85-89	**B+**
80-84	**B**
75-79	**C+**
70-74	**C**
60-69	**D**
0-59	**F**

ABSENCES

Per the University's Course Attendance policy (10.2.7), students are responsible for communicating with their instructors regarding absences. The Division of Student Affairs is available to verify extended absences: (973) 353-5063 or DeanofStudents@newark.rutgers.edu

HONOR PLEDGE

Please type and sign the following honor pledge on all your exams and assignments:
"On my honor, I have neither received nor given any unauthorized assistance on this examination (assignment)."

ACADEMIC INTEGRITY

As an academic community dedicated to the creation, dissemination, and application of knowledge, Rutgers University is committed to fostering an intellectual and ethical environment based on the principles of academic integrity. Academic integrity is essential to the success of

the University's educational and research missions, and violations of academic integrity constitute serious offenses against the entire academic community. The entire Academic Integrity Policy can be found here https://sasn.rutgers.edu/student-support/current-students/academic-performance-standards/academic-integrity-ai

LEARNING RESOURCES

- Rutgers Learning Center (tutoring services)
  Room 140, Bradley Hall
  (973) 353-5608
  https://sasn.rutgers.edu/student-support/tutoring-academic-support/learning-center
- Writing Center (tutoring and writing workshops)
  Room 126, Conklin Hall
  (973) 353-5847
  nwc@rutgers.edu
  https://sasn.rutgers.edu/student-support/tutoring-academic-support/writing-center

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