Syllabus as of 3/10/25

ET CS 622

Advanced Programming Techniques

Polymorphism, libraries, method specifications, code management, exceptions, generics, lambdas, streams, database connectivity, concurrent programming, functional programming, programming tests. Java will be used to illustrate these concepts. Students will implement a project or projects of their own choosing, in Java.

Prerequisites: MET CS 342 520, or 521; or instructor's consent.

Learning Objectives

By successfully completing this course, you will be able to do the following:

- Organize function code to promote lasting readability, reliability, and maintainability.
- Use the advanced features of Java for object-oriented programming.
- Design and develop applications using collections, generics, lambdas, streams in Java.
- Design and develop applications using concurrency, database connectivity, and networking in Java.

Instructor

Eric Braude, Ph.D.

Computer Science Department
Metropolitan College
Boston University
1010 Commonwealth Ave

Eric Braude received his Ph.D. from Columbia University in mathematics and Master's in Computer Science from the University of Miami. He taught at CUNY and Penn State, followed by twelve years in government and industry as a software engineer, scientist, and manager. He is an Associate Professor of Computer Science at Boston University's Metropolitan College where he has at times held the chairmanship and the acting associate deanship. His research concerns reliable program construction. Eric has written, co-written, or edited numerous papers and six books, including "Software Engineering" and "Software Design."

Initial Course Developer

Uday Chakraborty, Ph.D.

Professor of the Practice of Computer Science

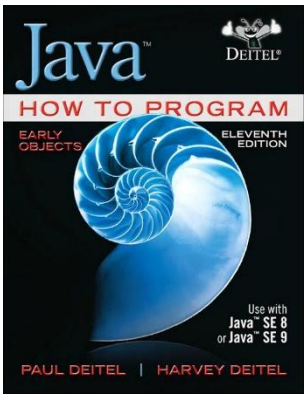
Having earned his Ph.D in computer science and engineering from Jadavpur Univers

ity in 1994, Dr. Chakraborty went on to gain professional experience working in the software industry on several large-scale commercial projects. His research is focused on machine learning, and other areas of expertise include software engineering, data mining, and advanced data structures and algorithms.

Professor Chakraborty's international professional and academic experience includes work as a software engineer at CMC Limited and research scientist position at the German National Research Center for Information Technology (GMD, now Fraunhofer-Gesellschaft) in Bonn, Germany. He was also a visiting scientist with the computer science department at Carnegie Mellon University, for which he received a United Nations Industrial Development Organization (UNIDO) Fellowship. Prior to Boston University, Chakraborty was professor of computer science at the University of Missouri at St. Louis.

Materials

Optional Book



Paul J. Deitel and Harvey Deitel (2018)

Java How to Program, Early Objects. **(11th Edition)**

Publisher: Pearson.

ISBN-13: 978-0134743356

ISBN-10: 0134743350

The book is NOT required for the course. It's an optional reference that may be handy for your learning.

This book can be purchased from Barnes and Noble at Boston University.

IDE Installation Guide

You may use either Eclipse or IntelliJ in this course. Install guides for both are below.

- *Eclipse Install Guide*

  This installation guide shows you how to download and install Eclipse, create and execute a HelloWorld project, and export a project for submission to Blackboard. Click to download the Eclipse install guide.

- *IntelliJ Install Guide*

This installation guide shows you how to download and install IntelliJ, create and execute a HelloWorld project, and export a project for submission to Blackboard. Click to download the IntelliJ install guide.

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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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. You may use the library's content whether you are connected through your online course or not, by confirming your status as a BU community member using your Kerberos password.

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 follow:

Go to Collections to access eBooks and eJournals directly.

If you have questions about library resources, go to Ask A Librarian to email the library or use the live-chat feature.

To locate course eReserves, go to 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

Smarthinking may be used only for current Boston University online courses and career services. Use of this service for purposes other than current coursework or career services may result in deactivation of your Smarthinking account.

Study Guide

This course is organized around seven weeks. The last week is reserved for the final exam so we will have six weeks to cover the material. The material is presented as modules, each module containing a set of related topics.

Module 1 Study Guide and Deliverables

Topics:	Lecture 1 Object-Oriented Fundamentals
Readings:	• Classes and objects review: Deitel & Deitel, Chapters 6 through 8 • Inheritance: Deitel & Deitel, Chapter 9 • Polymorphism and interfaces: Deitel & Deitel, Chapter 10 • Module 1 online content
Discussions:	Please post your introduction as soon as possible.
Assessments:	Interim Assessment 1 due first Sunday
Assignments:	Assignment 1 due first Wednesday at 6:00 AM ET
Live Classrooms:	• First Wednesday, from 8:00 PM to 9:00 PM ET • First Thursday, from 8:00 PM to 9:00 PM ET • Live Office: ○ Wednesday and Thursday after Live Classroom, for as long as there are questions

Module 2 Study Guide and Deliverables

Topics:	Lecture 2 Handling Text and Exceptions
Readings:	• Exception handling: Deitel & Deitel, Chapter 11 • Regular expression, StringBuilder: Deitel & Deitel, Chapter 14 • Text I/O, Files: Deitel & Deitel, Chapter 15 • Module 2 online content
Assessments:	Interim Assessment 2 due second Sunday at 6:00 AM ET

Assignments:	Assignment 2 due Second Wednesday, at 6:00 AM ET
Live Classrooms:	• Second Wednesday, from 8:00 PM to 9:00 PM ET • Second Thursday, from 8:00 PM to 9:00 PM ET • Live Office: ◦ Wednesday and Thursday after Live Classroom, for as long as there are questions

Module 3 Study Guide and Deliverables

Topics:	Lecture 3 Generics
Readings:	• Generic collections: Deitel & Deitel, Chapter 16 • Generic classes and methods: Deitel & Deitel, Chapter 20 • Module 3 online content
Assessments:	Interim Assessment 3 due Sunday, February 7 at 6:00 AM ET
Assignments:	Assignment 3 due third Wednesday at 6:00 AM ET
Live Classrooms:	• Third Wednesday, from 8:00 PM to 9:00 PM ET • Third Thursday, from 8:00 PM to 9:00 PM ET • Live Office: ◦ Wednesday and Thursday after Live Classroom, for as long as there are questions

Module 4 Study Guide and Deliverables

Topics:	Lecture 4 Binary I/O, JavaFX, Lambdas and Streams

Readings:	• Binary I/O, object serialization: Deitel & Deitel, Chapter 15 • Java SE 8 Lambdas and Streams: Deitel & Deitel, Chapter 17 • JavaFX: Deitel & Deitel, Chapter 22 • Module 4 online content
Assessments:	Interim Assessment 4 due Sunday, February 14 at 6:00 AM ET
Assignments:	Assignment 4 due fourth Wednesday, at 6:00 AM ET
Live Classrooms:	• Fourth Wednesday, from 8:00 PM to 9:00 PM ET • Fourth Thursday, from 8:00 PM to 9:00 PM ET • Live Office: ◦ Wednesday and Thursday after Live Classroom, for as long as there are questions

Module 5 Study Guide and Deliverables

Topics:	Lecture 5 Concurrency
Readings:	• Concurrency: Deitel & Deitel, Chapter 23 • Module 5 online content
Assessments:	Interim Assessment 5 due Sunday, February 21 at 6:00 AM ET
Assignments:	Assignment 5 due Fifth Wednesday, at 6:00 AM ET
Live Classrooms:	• Fifth Wednesday, from 8:00 PM to 9:00 PM ET • Fifth Thursday, from 8:00 PM to 9:00 PM ET • Live Office: ◦ Wednesday and Thursday after Live Classroom, for as long as there are questions

Module 6 Study Guide and Deliverables	
Topics:	• Lecture 6 Java Database Connectivity • Lecture 7 Java Networking Connectivity
Readings:	• Deitel & Deitel, Chapter 24 • Networking: Deitel & Deitel, Chapter 28 (online; accessible from the textbook's web site) • Module 6 online content
Assessments:	Interim Assessment: none
Assignments:	Assignment 6 due Sixth Wednesday, at 6:00 AM ET
Live Classrooms:	• Sixth Wednesday, from 8:00 PM to 9:00 PM ET • Sixth Thursday, from 8:00 PM to 9:00 PM ET • Live Office: ◦ Wednesday and Thursday after Live Classroom, for as long as there are questions

Final Exam Details

The Final Exam is a proctored exam available from seventh **Wednesday, at 6:00 AM ET to Saturday, at 11:59 PM ET**.**Final Exam**