

Course Outline

School:	Eng. Tech. & Applied Science
Department:	Information and Communication Engineering Technology (ICET)
Course Title:	Java Programming
Course Code:	COMP 228
Course Hours/Credits:	56
Prerequisites:	COMP 123
Co-requisites:	N/A
Eligible for Prior Learning, Assessment and Recognition:	Yes
Originated by:	ILIA NIKA
Creation Date:	Fall 2004
Revised by:	ILIA NIKA
Revision Date:	Summer 2020
Current Semester:	Summer 2025
Approved by:	

Clarence Cheung, Associate Dean/Dean,
Eng. Tech. & Applied Science

Students are expected to review and understand all areas of the course outline.

Retain this course outline for future transfer credit applications. A fee may be charged for additional copies.

This course outline is available in alternative formats upon request.

Acknowledgement of Traditional Lands

Centennial is proud to be a part of a rich history of education in this province and in this city. We acknowledge that we are on the treaty lands and territory of the Mississaugas of the Credit First Nation and pay tribute to their legacy and the legacy of all First Peoples of Canada, as we strengthen ties with the communities we serve and build the future through learning and through our graduates. Today the traditional meeting place of Toronto is still home to many Indigenous People from across Turtle Island and we are grateful to have the opportunity to work in the communities that have grown in the treaty lands of the Mississaugas. We acknowledge that we are all treaty people and accept our responsibility to honor all our relations.

Course Description

Building on fundamentals of Object-Oriented programming, this course covers Component-based Application Development and Database Connectivity using the Java programming language. Coursework emphasizes advanced object oriented features, how to create complex GUI applications with JavaFX, interacting with the databases using JDBC, concurrency, and Java collections framework.

External Standard Information (ESI)

N/A

Program Outcomes

Successful completion of this and other courses in the program culminates in the achievement of the Vocational Learning Outcomes (program outcomes) set by the Ministry of Colleges and Universities in the Program Standard. The VLOs express the learning a student must reliably demonstrate before graduation. To ensure a meaningful learning experience and to better understand how this course and program prepare graduates for success, students are encouraged to review the Program Standard by visiting <http://www.tcu.gov.on.ca/pepg/audiences/colleges/progstan/>. For apprenticeship-based programs, visit <https://www.skilledtradesontario.ca/about-trades/trades-information/>.

Course Learning Outcomes

The student will reliably demonstrate the ability to:

1. Examine the Java SE Platform.
2. Explain advanced OOP features in Java and build Java applications that incorporate inheritance, polymorphism, and interfaces.
3. Design, code, and test rich client applications using JavaFX.
4. Handle exceptional events and improve the robustness of Java applications using Java Exception Handling mechanism.
5. Design, code, and test Java applications that implement data access capabilities using JDBC and allow the user to retrieve, insert, update, and delete database records.
6. Design, code, and test multithreaded applications in Java.
7. Use the Java Collections Framework to organize data and improve the performance of Java applications.

Essential Employability Skills (EES)

The student will reliably demonstrate the ability to*:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
4. Apply a systematic approach to solve problems.
5. Use a variety of thinking skills to anticipate and solve problems.
10. Manage the use of time and other resources to complete projects.

*There are 11 Essential Employability Skills outcomes as per the Ministry Program Standard. Of these 11 outcomes, the following will be assessed in this course.

New Essential Skills (NES)

N/A

Global Citizenship and Equity (GC&E) Outcomes

N/A

Methods of Instruction

Interactive lectures

Demonstrations

Hands-on exercises

Supervised lab sessions

Pair programming

Text and Other Instructional/Learning Materials

The costs of textbooks or other learning material are available through the Centennial College Bookstore
<https://www.bkstr.com/centennialprogressstore/shop/textbooks-and-course-materials>.

Text Book(s):

Required:

Deitel & Deitel, Java How to Program, 11/e (Early Objects) , ISBN-10: 0134743350, ISBN-13: 978-0134743356, Edition: 11 , 2017.

Reference:

Big Java: Early Objects, Interactive Edition, 7th Edition, ISBN: 978-1-119-49909-1, December 2018.

Online Resource(s):

See eCentennial course shell

Please see the weekly topical outline for any Additional Learning Resources required for your section of this course.

Evaluation Scheme

- ⇒ Test 1: MC questions covering Week 1 - 6 materials - 5%
- Hands-On Test covering Week 1 - 6 materials: 20%
- ⇒ Test 2: MC questions covering Week 7 - 13 materials - 5%

Hands-On Test covering Week 7 - 13 materials: 20%

- ⇒ Lab Assignment 1: Developing Simple Java Applications
- ⇒ Lab Assignment 2: Creating and Using Java Methods
- ⇒ Lab Assignment 3: Using Inheritance and Polymorphism in Java Applications
- ⇒ Lab Assignment 4: Developing GUI applications with JavaFX
- ⇒ Lab Assignment 5: Developing database applications using JDBC.
- ⇒ Lab Assignment 6: Using multithreading and generic collections in Java applications

Evaluation Name	CLO(s)	EES Outcome(s)	NES Outcome(s)	GCE Outcome(s)	Weight/ 100
Test 1	1, 2	1, 4, 5			25
Test 2	3, 4, 5, 6, 7	1, 4, 5, 10			25
Lab Assignment 1	1, 2	4, 5, 10			5
Lab Assignment 2	1, 2	4, 5, 10			5
Lab Assignment 3	1, 2	4, 5, 10			7
Lab Assignment 4	2, 3	4, 5, 10			10
Lab Assignment 5	3, 4, 5	4, 5, 10			15
Lab Assignment 6	6, 7	4, 5, 10			8
Total					100%

If students are unable to write a test they should immediately contact their professor or program Associate Dean for advice. In exceptional and well documented circumstances (e.g. unforeseen family problems, serious illness, or death of a close family member), students may be able to write a make-up test.

All submitted work may be reviewed for authenticity and originality utilizing College approved plagiarism prevention software. Students who do not wish to have their work submitted to College approved plagiarism prevention software must, by the end of the second week of class, communicate this in writing to the instructor and make mutually agreeable alternate arrangements.

When writing tests, students must be able to produce official Centennial College photo identification or they may be refused the right to take the test or test results will be void.

Tests or assignments conducted remotely may require the use of online proctoring technology where the student's identification is verified and their activity is monitored and/or recorded, both audibly and visually through remote access to the student's computer and web camera. Students must communicate in writing to the instructor as soon as possible and prior to the test or assignment due date if they require an alternate assessment format to explore mutually agreeable alternatives.

Student Accommodation

The Centre for Accessible Learning and Counselling Services (CALCS) (<http://centennialcollege.ca/calcs>) provides programs and services which empower students in meeting their wellness goals, accommodation and disability-related needs. Our team of professional psychotherapists, social workers, educators, and staff offer brief, solution-focused psychotherapy, accommodation planning, health and wellness education, group counselling, psycho-educational workshops, adaptive technology, and peer support. Walk in for your first intake session at one of our service locations (Ashtonbee Room L1-04, Morningside Room 190, Progress Room C1-03, The Story Arts Centre Room 285, Downsview Room 105) or contact us at calcs@centennialcollege.ca, 416-289-5000 ext. 3850 to learn more about accessing

CALCS services.

Use of Dictionaries

Program or School Policies

N/A

Course Policies

N/A

College Policies

Students should familiarize themselves with all College Policies that cover academic matters and student conduct.

All students and employees have the right to study and work in an environment that is free from discrimination and harassment and promotes respect and equity. Centennial policies ensure all incidents of harassment, discrimination, bullying and violence will be addressed and responded to accordingly.

Academic Honesty

Academic honesty is integral to the learning process and a necessary ingredient of academic integrity. Forms of academic dishonesty include cheating, plagiarism, and impersonation, among others. Breaches of academic honesty may result in a failing grade on the assignment or course, suspension, or expulsion from the college. Students are bound to the College's AC100-11 Academic Honesty and Plagiarism policy.

To learn more, please visit the Libraries information page about Academic Integrity

<https://libraryguides.centennialcollege.ca/academicintegrity> and review Centennial College's Academic Honesty Module:

https://myappform.centennialcollege.ca/ecentennial/articulate/Centennial_College_Academic_Integrity_Module_%202/story.html

Use of Lecture/Course Materials

Materials used in Centennial College courses are subject to Intellectual Property and Copyright protection, and as such cannot be used and posted for public dissemination without prior permission from the original creator or copyright holder (e.g., student/professor/the College/or third-party source). This includes class/lecture recordings, course materials, and third-party copyright-protected materials (such as images, book chapters and articles). Copyright protections are automatic once an original work is created, and applies whether or not a copyright statement appears on the material. Students and employees are bound by College policies, including AC100-22 Intellectual Property, and SL100-02 Student Code of Conduct, and any student or employee found to be using or posting course materials or recordings for public dissemination without permission and/or inappropriately is in breach of these policies and may be

sanctioned.

For more information on these and other policies, please visit www.centennialcollege.ca/about-centennial/college-overview/college-policies.

Students enrolled in a joint or collaborative program are subject to the partner institution's academic policies.

PLAR Process

This course is eligible for Prior Learning Assessment and Recognition (PLAR). PLAR is a process by which course credit may be granted for past learning acquired through work or other life experiences. The PLAR process involves completing an assessment (portfolio, test, assignment, etc.) that reliably demonstrates achievement of the course learning outcomes. Contact the academic school to obtain information on the PLAR process and the required assessment.

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Semester:	Summer 2025	Professor(s) Name:	See eCentennial course shell
Section Code:	ALL	Contact Information:	See eCentennial course shell
Meeting Time & Location:	See myCentennial timetable	Office Hours:	See myCentennial timetable
Delivery Method:	See myCentennial timetable		

Topical Outline (subject to change):

ORIGINAL TOPICAL

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name and Weight	Evaluation Date
1	Introduction to Java Programming language Anatomy of a Java Application Eclipse IDE and IntelliJ IDEA	Chapter 1,2	Examine the Java SE Platform and explain the new features. Explain the concept of JVM. Write simple Java applications with I/O capabilities using Eclipse IDE or IntelliJ IDEA.	Lecture Demonstration Lab Session		
2	Classes and Objects in Java Instance variables and instance methods Primitives and Reference Types	Chapter 3	Declare classes and use them to create objects. Define and Implement the attributes and behaviors of a Java class. Differentiate between local and instance variables. Use constructors to initialize data. Call object's methods to perform their tasks.	Lecture Demonstration Lab Session	Lab Assignment 1: Creating and using simple Java classes.	Week 2
3	Methods in Java Anatomy of a Java method Static methods Java API packages	Chapter 6, 7	Create and use programmer defined methods in Java classes. Declare static variables. Create and use static methods in Java classes.	Lecture Demonstration Lab Session		

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name and Weight	Evaluation Date
	Method overloading		Implement method overloading. Use arrays and pass them as arguments to Java methods.			
4	Advanced Object-oriented programming in Java A deeper look at Java classes	Chapter 8	Create and use Java classes as a means of developing component-based applications. Use 'this' keyword. Use composition in Java applications. Define and use enum type in Java classes. Use package access. Use final instance variables. Design Java applications composed of multiple classes.	Lecture Demonstration Lab Session	Lab Assignment 2: Creating and using instance and static methods in Java classes.	Week 4
5	Inheritance In Java	Chapter 9	Explain the concept of inheritance and use it to create new classes based on existing classes. Explain the concept of superclasses and subclasses. Use protected keyword in superclass to give subclass methods access to superclass members. Understand how constructors are used in inheritance hierarchies. Develop a Java application that implements an inheritance hierarchy.	Lecture Demonstration Lab Session		
6	Polymorphism in Java Abstract classes Interfaces	Chapter 10	Explain the polymorphism concept. Use overridden methods to implement polymorphism. Define and use abstract classes.	Lecture Demonstration Lab Session	Lab Assignment 3: Using Inheritance, Polymorphism, and	Week 6

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name and Weight	Evaluation Date
			Define and implement Java interfaces. Develop Java applications that utilize the abstract classes and interfaces.		Interfaces in Java applications	
7	Introduction to GUI Programming and JavaFX	Chapter 12 https://openjfx.io/	Explain OpenJFX, an open source, next generation client application platform for desktop, mobile and embedded systems built on Java. Create JavaFX GUIs and handle events generated by user interactions with them. Explain the structure of a JavaFX app window. Create JavaFX scenes that contain: Labels ImageViews TextFields Buttons Sliders Arrange GUI components using layout containers VBox and GridPane.	Lecture Demonstration	MC Questions covering Week 1-6 materials - 5% Hands-On Test - 20%	Week 7
8	Developing complex GUI applications with JavaFX	Chapter 13	Use JavaFX layout panels for laying out the nodes in a scene graph. Build JavaFX GUIs with: RadioButtons ListViews BorderPanes TitledPanes Handle mouse events. Use property binding and property listeners. Create layouts and controls programmatically.	Lecture Demonstration Lab Session		
9	Exception Handling Introduction to Data Access with JDBC	Chapter 11, 24	Explain Exception Handling mechanism in Java. Use try and catch blocks to detect and handle exceptions.	Lecture Demonstration Lab Session	Lab Assignment 4: Developing GUI applications	Week 9

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name and Weight	Evaluation Date
	Connection, Statement and ResultSet interfaces		Use throw statement to indicate a problem. Use finally block to release the resources. Understand JDBC API to access databases. Create Java applications that establish a connection to a database and retrieve data from its tables.		with JavaFX	
10	Inserting, Updating and Deleting rows Prepared Statements RowSet interface	Chapter 24	Write Java applications that insert, update or delete database records. Use PreparedStatement. Use the RowSet interface to create a disconnected set of records and process multiple tables.	Lecture Demonstration Lab Session		
11	Multithreading in Java	Chapter 23	Explain multithreading and its implementation in Java Applications. Understand the life-cycle of a thread. Use Thread class and Runnable interface. Write multithreaded applications in Java.	Lecture Demonstration Lab Session	Lab Assignment 5: Developing database applications using JDBC. Students can work in pairs for this assignment.	Week 11
12-13	Generic Collections	Chapter 16	Explain the Java Collections Framework. Use generic collection classes: ArrayList, LinkedList, Queue, Stack, HashSet, and HashMap in Java Applications. Use various algorithms of the Collections class to process collections. Explain Java SE 9 new factory methods for creating small immutable Lists, Sets, and Maps.	Lecture Demonstration Lab Session	Lab Assignment 6: Using Multithreading and generic collections in Java applications.	Week 13
14	Test 2	Chapter 12,16,23,24,	Develop Complex Java applications	Review materials for	Test 2:	Week 14

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name and Weight	Evaluation Date
		25		Test 2	MC Questions covering Week 7-13 materials - 5% Hands-On Test - 20%	