

COLLEGE OF ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CMPS 251 Object-Oriented Programming
Fall 2019

Instructor Information

Dr. Abdelkarim Erradi
Associate Professor
Office: 132 Female Engineering Building
Phone: 4403 4254
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Office Hour: Sunday 8:10am to 9:10am at my office C07-132

TA Information

Name: Fatima Amir Hamza
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Phone: +974 4403 4284
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Office Hours: Tutorial sessions Wednesday 8:30 to 9:30am and Thursday 8:00 to 9:00am at C01-A220

Class/Laboratory Schedule

Classes:

- Section L51, UTR 10 am - 10:50 am at **C07- 0250**
- Section L52, UTR 11 am - 11:50 am at **C07- 0144**

Labs:

- Sunday 12 pm - 2:50 pm or Tuesday 3:30 pm - 6:20 pm at C01- A223 (for L51)
- Wed 2 pm - 4:50 pm at C07-0262 or Thursday 12 pm - 2:50 pm at C01- A223 (for L52)

Coordinator Information

Same as the instructor.

Course Information

Catalog Description:

Fundamentals of object-oriented programming, object-oriented design, apply object oriented concepts such as abstraction, encapsulation, composition, inheritance, polymorphism, and interfaces. Graphical user interface and event-driven programming; exception handling; additional object-oriented features. The laboratory provides practical object-oriented programming experience.

Credits:

4 Credit hours

Contact Hours:

3 Lecture hours

3 Lab hours

Prerequisites:

- CMPS 151 Programming Concepts

Textbook(s):

Java: How To Program. Paul Deitel and Harvey Deitel. Pearson. 11th Edition.

References:

- Instructor's handouts
- eResources and Videos
- The *Java Tutorials* - Oracle <https://docs.oracle.com/javase/tutorial/>

Course Objectives:

- Design and develop programs using the object-oriented programming paradigm.
- Apply features of object-oriented paradigm, such as modularity, abstraction, encapsulation, inheritance and polymorphism.
- Analyze and solve problems from an object-oriented perspective.

Course Learning Outcomes (CLO):

- Apply object-oriented concepts including encapsulation, composition, inheritance, and polymorphism in developing a solution of a computing problem.
- Manage data using files.
- Design and implement simple Graphical User Interfaces.
- Work effectively in teams to develop, debug, and document a programming project.

Relationship of Course Outcomes to Student Outcomes (SO):

| Course Learning Outcomes (CLO) | Related CS Student Outcomes (SO) | | | | | | Related CE Student Outcomes (SO) | | | | | | |
|--------------------------------|----------------------------------|---|---|---|---|---|----------------------------------|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1 | √ | √ | | | | √ | √ | | | | | | |
| 2 | | √ | | | | | √ | | | | | | |
| 3 | | √ | | | | | √ | | | | | | |
| 4 | | √ | √ | | √ | √ | √ | | √ | | | | |

CS Student Outcomes (CS-SO)

- Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
- Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
- Communicate effectively in a variety of professional contexts.

- Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
- Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
- Apply computer science theory and software development fundamentals to produce computing-based solutions.

CE Student Outcomes (CE-SO)

- An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- An ability to communicate effectively with a range of audiences.
- An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Topics Covered:

| Topics | Chapter | Weeks |
|---|---------|-----------|
| Introduction to Java | 2, 4, 5 | 1 |
| Object-oriented Programming Concepts | 3, 6 | 2 |
| Relations between Classes | 8 | 1 |
| Packages, Enumeration & Exceptions | 8 | 1 |
| Arrays, Lists, Lambdas and Streams | 7, 17 | 2 |
| Review and Midterm (during Week 7) | | 0.5 |
| Inheritance | 9 | 1 |
| Polymorphism | 10 | 1 |
| Graphical User Interface (GUI) | 12, 13 | 2 |
| Managing data using files | 15 | 1 |
| Exception handling | 11 | 0.5 |
| Review | | 1 |
| Total | | 14 |

Method of Instruction

The course is taught through lectures, examples, demos and a project. The approach adopted is problem based learning by developing hands-on multi-phases project and assignments to

reinforce the concepts introduced in the lectures. Throughout the course, students perform hands-on exercises that build their practical knowledge and skills to design, build and test Object Oriented Software using Java. The course uses concrete examples taken from real applications.

Learning Activities

To achieve the objectives of the course, students will carry out several learning activities:

1. **Readings:** The students are expected to read the assigned textbook chapter, slides, online resources, videos, and tutorial materials. The assigned reading assignments will elaborate on information presented in the lectures. **Students should get familiar with the provided material prior to the lecture.**
2. **Lectures:** Students are expected to attend every lecture; this is where the course material will be discussed and ambiguities clarified. Class participation is highly encouraged. The technologies to be applied in the project and the assignments will be presented in the lectures via examples and demos. Practical demos are often done in class including designing and coding and end-to-end solution to a given problem. UML is used occasionally to illustrate OO design. The students are required to practice and extend the examples and the demos provided. The study material, examples and links to relevant resources will be made available on Blackboard.
3. **Assignments:** Lab assignments and a project will be given so that students practice and apply the material covered in class. Each assignment will require the students to practice the material learned during the course.
4. **Exams:** To keep the students on track continuous assessment is adopted in-class using quizzes and off-class using lab assignments. The midterm and the final exams have a theoretical part and a practical programming part to build a solution to a problem. Quizzes are used for continued assessment.

Assessment Methods and Grading Policy

Lab Assignments: 20% [4 out of 5]

Lab Project: 20% [Delivered in 2 phases of 10% each]

Quizzes: 15% [4 out of 5 quizzes]

Midterm: 20% [Theory 20%]

Final Exam: 25% [Theory 15% and practical during the last lab 10%]

ABET Contribution of Course to Professional Component

Math & Basic Science : 20%

Engineering : 80%

Engineering Design :

General Education :

Computer/Software Usage

Eclipse IDE environment is used to develop Java programs.

Visual Paradigm could be used to create Class Diagrams.

Laboratory Projects

See the syllabus of laboratory part of this course.

Course Ground Rules

- Assessment deliverable items should be submitted on time and following the embedded instructions.
- Attendance: Attendance is mandatory according to University policies and more than 25% absence will not qualify you for the course credit.
- Cheating and/or Plagiarism: Cheating and/or Plagiarism will not be tolerated and disciplinary actions will be taken in accordance with Qatar University regulations and policies. Outsourcing or getting external help to complete assignments is strongly prohibited, and disciplinary actions will be taken. Check the undergraduate students' handbook for further details on University policies.
- Blackboard: Check the course website frequently for updates (e.g. announcements, lectures notes, examples, etc.).
- Taking Notes: Students are responsible for taking notes during the lecture. Exams will include some of the material discussed during lecture in addition to that given in the textbook and class notes.
- Due Dates: It is the responsibility of every student to remember all due dates.

University Code of Conduct

QU expects its students to adopt and abide by the highest standards of conduct in their interaction with professors, peers, staff members and the wider university community. Moreover, QU expects its students to act maturely and responsibly in their relationships with others. Every student is expected to assume the obligations and responsibilities required from them for being members of the QU community.

As such, a student is expected not to engage in behaviors that compromise their integrity, as well as the integrity of QU. Further information regarding the University Code of Conduct may be found on the web at <http://www.qu.edu.qa/students/code-of-conduct>

Support for Students with Special Needs

It is Qatar University policy to provide educational opportunities that ensure fair, appropriate and reasonable accommodation to students who have disabilities that may affect their ability to participate in course activities or meet course requirements. Students with disabilities are encouraged to contact their Instructor to ensure that their individual needs are met. The University through its Special Needs Section will exert all efforts to accommodate for individuals' needs.

Contact Information for Special Needs Section:

Tel-Female: (00974) 4403 3843

Tel-Male: (00974) 4403 3854

Location: Student Activities Building

Email: specialneeds@qu.edu.qa

Academic Support and Learning Resources

The University Student Learning Support Center (SLSC) provides academic support

services to male and female students at QU. The SLSC is a supportive environment where students can seek assistance with academic coursework, writing assignments, transitioning to college academic life, and other academic issues. SLSC programs include: Peer Tutoring, the Writing Lab, Writing Workshops, and Academic Success Workshops. Students may also seek confidential academic counseling from the professional staff at the Center.

Contact Information for Students Support and Learning Resources:

Tel: (00974) 4403 3876

Fax: (00974) 4403 3871

Location: Student Activities Building

E-mail: learningcenter@qu.edu.qa

Student Complaints Policy

Students at Qatar University have the right to pursue complaints related to faculty, staff, and other students. The nature of the complaints may be either academic or non-academic. For more information about the policy and processes related to this policy, you may refer to the student handbook.

Declaration

This syllabus and contents are subject to changes in the event of extenuating circumstances. The instructor (with approval of the Head of Department) reserves the right to make changes as necessary. If changes are necessitated during the term of the course, the students will be notified by email communication and posting the notification on the online teaching tool Blackboard. It is the student's responsibility to check on announcements made while they were absent.

Faculty Name: Abdelkarim Erradi

Last Modified: August 22, 2019

Date: August 22, 2019