



浙江大學

COMP920

Object-Oriented Programming Fundamentals

Instructor contact details

Lecturer-in-charge: TBA

Email: TBA or send general enquiries to wlyxy_29@zju.edu.cn

Office location: to be announced

Consultation Times: to be announced, and by appointment

Teaching Times and Locations

The Time and Location: TBA

Lecture sessions include lectures, as well as in-class discussions and test(s).

Academic Level

Postgraduate

Units of Credit

The course is worth 6 units of credit at Zhejiang University, with total of 40 teaching hours.

Overview

This unit introduces essential object-oriented design methods and language mechanisms, especially the principles of modelling through Rational Unified Process and agile processes using Unified Modeling Language (UML) and Java or C++, both of which are industry standard. Students work in small groups to experience the process of object-oriented analysis, object-oriented design, implementation and testing by building a real-world application. Java or C++ is used as the implementation language and a special emphasis is placed on those features of Java or C++ that are important for solving real-world problems. Advanced software engineering features, including exceptions and name spaces are thoroughly covered.

Prerequisites

None

Course Learning Outcomes

On successful completion of this course students will be able to:

1	Explain the steps in creating an executable program for a computer, including the intermediate representations and their purpose.
2	Manipulate binary patterns and understand the use of binary to represent numbers.
3	Apply good programming style and understand the impact of style on developing and maintaining programs.

4	Effectively use a version control system and the Linux command line tools for incremental development.
5	Explain the benefits of object-oriented design and understand when it is an appropriate methodology to use.
6	Design object-oriented solutions for small systems involving multiple objects.
7	Implement, test and debug solutions in C++ and Java.
8	Identify the relative merits of different algorithmic designs.
9	Independently find and interpret discipline related documentation.
10	Explain the relevance of ethics in the context of Software Engineering.

Learning Resource

Lecture handouts will be given in class.

Recommended Texts

"Problem Solving with C++", 9e Global Edition, Walter Savitch, ISBN-13:9781292018249, Addison-Wesley, 2015.

Robert C. Martin, *Agile Software Development: Principles, Patterns and Practice*. Prentice Hall, 2003.
 Craig Larman, *Applying UML and Patterns: An Introduction to Object - Oriented Analysis and Design and Iterative Developments*.

Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides, *Design Patterns*. Addison Wesley, 1995.
 Allan Shalloway, James R. Trott, *Design patterns explained: A new perspective on Object-Oriented Design* (2nd). Addison Wesley, 2005.
 Erich Freeman, Elisabeth Freeman, Kathy Sierra and Bert Bates, *Head First Design Patterns*. O`Reilly, 2004.

Teaching Strategies

- Lectures introduce concepts and show examples
- Problem sets reinforce concepts, provide additional examples and allow students to solve problems
- Assignments further reinforce concepts and allow students to solve larger problems
- Mid-term examination test understanding and skills

Teaching Rationale

- Lectures will include worked programs that explain concepts as well as mathematical analyses used in performance measurement. Exercises are provided that reinforce

learning and develop programming skills. Assignments are an opportunity to apply your skills to larger problems.

- Be mindful of the importance of spending time on actual programming. The C language is particularly complex requiring attention to both high-level design and low-level detail at the same time. Most students require a whole session of practice at C programming to achieve the required level of competency.

Course Delivery

The course will be taught in English through lectures, seminars, field trips, group activities and presentations. In addition to these, there will also be guest speakers and optional field trips available for students who would like to enhance their learning experience. The course sessions will be running during the weekdays, Monday to Friday. The course will be at a total of 40 hours.

Schedule

Week	Description	
Day 1	Fundamental Programming Structures in Java	23 / 12 / 2019
Day 2	Classes and Objects in Java <i>Master the fundamental elements of OOP and related Java features</i>	24 / 12 / 2019
Day 3	Object Design and Programming with Java <i>Understand the object-oriented way of programming</i>	25 / 12 / 2019
Day 4	Java Interfaces <i>Creating high levels of abstraction</i>	26 / 12 / 2019
Day 5	Java Exception Handling <i>Writing robust</i>	27 / 12 / 2019
Day 6	Java Exception Handling <i>Industrial-strength Java code</i>	28 / 12 / 2019
Day 7	Mid-term examination	29 / 12 / 2019
Day 8	Java Collections API <i>Managing collections of objects</i>	02 / 01 / 2020
Day 9	Java Input/Output API (Optional) <i>Dealing with serialized data and objects</i>	03 / 01 / 2020
Day 10	Differences between Java, C++ and/or C# (Optional) <i>Connecting with one's knowledge of another OO language to avoid pitfalls</i>	06 / 01 / 2020
Day 11	Differences between Java, C++ and/or C# (Optional) <i>Connecting with one's knowledge of another OO language to avoid pitfalls</i> <ul style="list-style-type: none"> • Program Structure • Namespaces 	07 / 01 / 2020

	<ul style="list-style-type: none"> • Comments • Data Types • Miscellaneous Differences 	
Day 12	Practice Lab	08 / 01 / 2020
Day 13	Review of Unit of Study and exam Preparation	09 / 01 / 2020
Day 14	Assessment Due: Final exam	10 / 01 / 2020

Assessments

Details on each of the assessments will be discussed during class lectures.

Assignment	20%	Due date: 09 / 01 / 2020
Participation	10%	In class
Mid-term examination	35%	In class: 29 / 12 / 2019
Final exam	35%	In class: 10 / 01 / 2020

Grade Descriptors

HD	High Distinction	85 - 100
D	Distinction	75 - 84
CR	Credit	65 - 74
P	Pass	50 - 64
F	Fail	0 - 49

High Distinction 85-100

Treatment of material evidences an advanced synthesis of ideas
 Demonstration of initiative, complex understanding and analysis
 Work is well-written and stylistically sophisticated, including appropriate referencing, clarity, and some creativity where appropriate
 All criteria addressed to a high level

Distinction 75-84

Treatment of material evidences an advanced understanding of ideas
 Demonstration of initiative, complex understanding and analysis
 Work is well-written and stylistically strong
 All criteria addressed strongly

Credit 65-74

Treatment of material displays a good understanding of ideas
Work is well-written and stylistically sound, with a minimum of syntactical errors All criteria addressed clearly

Pass 50-64

Treatment of material indicates a satisfactory understanding of ideas Work is adequately written, with some syntactical errors
Most criteria addressed adequately

Fail 0-49

Treatment of ideas indicates an inadequate understanding of ideas Written style inappropriate to task; major problems with expression Most criteria not clearly or adequately addressed

Academic Integrity

Students are expected to uphold the university's academic honesty principles which are an integral part of the university's core values and principles. If a student fails to observe the acceptable standards of academic honesty, they could attract penalties and even disqualification from the course in more serious circumstances. Students are responsible for knowing and observing accepted principles of research, writing and any other task which they are required to complete.

Academic dishonesty or cheating includes acts of plagiarism, misrepresentation, fabrication, failure to reference materials used properly and forgery. These may include, but are not limited to: claiming the work of others as your own, deliberately applying false and inaccurate information, copying the work of others in part or whole, allowing others in the course to copy your work in part or whole, failing to appropriately acknowledge the work of other scholars/authors through acceptable referencing standards, purchasing papers or writing papers for other students and submitting the same paper twice for the same subject.

This Academic Integrity policy applies to all students of the Zhejiang University in all programmes of study, including non-graduating students. It is to reinforce the University's commitment to maintain integrity and honesty in all academic activities of the University community.

Policy

The foundation of good academic work is honesty. Maintaining academic integrity upholds the standards of the University.

The responsibility for maintaining integrity in all the activities of the academic community lies with the students as well as the faculty and the University. Everyone in this community must work together to ensure that the values of truth, trust and justice are upheld.

Academic dishonesty affects the University's reputation and devalues the degrees offered.

The University will impose serious penalties on students who are found to have violated this Policy. The following penalties may be imposed:

- Expulsion;
- Suspension;
- Zero mark/fail grade;
- Marking down;
- Re-doing/re-submitting of assignments or reports; and ○ Verbal or written warning.