

OBJECT ORIENTED PROGRAMMING WITH JAVA (20CP204T)

Presented by:

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Course Introduction- Teaching Scheme

20CP204T					Object Oriented Programming with Java					
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
2	0	0	2	2	25	50	25			100

Course Objectives:

- To build an understanding of basic concepts of object-oriented programming techniques
- To develop programming skills in Java programming language
- To implement object-oriented techniques using Java language features.
- To develop software using object-oriented programming paradigms

Syllabus

UNIT 1 BASICS OF JAVA Features of Object Oriented Programming and Java, Basics of Java programming, Data types, Variables, Operators, Control structures including selection, Looping, Java methods, Overloading, Math class, Arrays in Java.	7 Hrs.
UNIT 2 INHERITANCE Basics of objects and classes in java, Constructors, Visibility modifiers, Inbuilt classes in Java, this reference; Inheritance in java, Overriding, Object class, Polymorphism, Dynamic binding, Abstract class, Interface in java, Package in java.	7 Hrs.
UNIT 3 I/O PROGRAMMING, EXCEPTION AND MULTITHREADING Introduction to Java IO streams, Character and Binary streams, reading data from and writing data to files, Difference between error and exception, Exception handling in Java, Multithreading in Java, Thread life cycle and methods, Runnable interface, Thread synchronization	6 Hrs.
UNIT 4 EVENT HANDLING AND GUI PROGRAMMING Event handling in Java, GUI Components and Layouts, Applet and its life cycle.	6 Hrs.
Max. 26 Hrs.	

Text/Reference Books

- Brett D. McLaughlin, Head First Object-Oriented Analysis and Design, O' Reilly, 2006
- Matt Weisfeld, The Object-Oriented Thought Process, Addison-Wesley Professional, 2019
- Herbert Schildt, The Complete Reference, Java 2, McGraw Hill, 2020
- Balagurusamy, Programming with Java – A Primer, McGraw Hill, 2019

Prerequisite

- No prerequisite subject
- Fundamental knowledge of programming

OBE (Outcome Based Education)

- An education in which an emphasis is placed on
 - ▣ Clarity of Focus: a clearly articulated idea of what students are expected to know and be able to do
 - ▣ Designing down: the curriculum design must start with a clear definition of the intended outcomes about skills and knowledge students need to have, when they leave the school system
 - ▣ High expectations: high and challenging standards of performance in order to encourage students to engage deeply in what they are learning
 - ▣ Expanded opportunities: provide expanded opportunities for all students.
- Students are assisted when and where they have challenges.

OBE (Outcome Based Education)...

OBE shifts from measuring input and process to include measuring the output (outcome).



Image Source: “Importance of Outcome Based Education (OBE) to Advance Educational Quality and enhance Global Mobility.” (2018).

- 4 PEOs, 12 POs and 6 COs

Program Education Objectives (PEOs)

1. To prepare graduates who will be successful professionals in industry, government, academia, research, entrepreneurial pursuit and consulting firms
2. To prepare graduates who will make technical contribution to the design, development and production of computing systems
3. To prepare graduates who will get engage in lifelong learning with leadership qualities, professional ethics and soft skills to fulfill their goals
4. To prepare graduates who will adapt state of the art development in the field of computer engineering

Program Outcomes (POs)

1. Engineering knowledge
2. Problem analysis
3. Design / development of solutions
4. Conduct investigations of complex problems
5. Modern tool usage
6. The engineer and society
7. Environment and sustainability
8. Ethics
9. Individual and team work
10. Communication
11. Project management and finance
12. Life-long learning

Program Specific Outcomes (PSOs)

- The graduates of CSE department will be able to:
 1. Develop computer engineering solutions for specific needs in different domains applying the knowledge in the areas of programming, algorithms, hardware-interface, system software, computer graphics, web design, networking and advanced computing.
 2. Analyze and test computer software designed for diverse needs.
 3. Pursue higher education, entrepreneurial ventures and research.

Course Outcomes (COs)

- On completion of the course, student will be able to
 - ▣ CO1- Describe the basic features of Object-oriented programming and map them with the Java.
 - ▣ CO2- Distinguish Objects and Classes using Java.
 - ▣ CO3- Demonstrate Inheritance and Runtime Polymorphism
 - ▣ CO4- Apply I/O handling, exception handling for interactive problem.
 - ▣ CO5- Use the concepts of Event Handling in GUI Programming.
 - ▣ CO6- Construct object-oriented solutions for small systems involving multiple objects.

Traditional Education v/s OBE

Traditional Education	Outcome Based Education
The approach is exam-driven.	Students are assessed on an ongoing basis.
Learning is textbook/worksheet-bound, subjective and teacher-centered	Learning is objective learner-centered, the teacher facilitates and constantly applies group work and team work for new tasks
Learners are passive	Learners are active
Emphasis on what lecturer hopes to achieve	Emphasis on specific outcomes
Rote learning	Critical thinking, reasoning and action
Textbook/worksheets focused and teacher centered	Learner centered and educator use group/team work

Pedagogy

- Use of
 - ▣ Board
 - ▣ Powerpoint Presentations
 - ▣ Puzzles
 - ▣ Program Execution

Office Hour

- Tuesday, 11:00 AM to 12:00 PM
- Take prior permission through mail and then come to meet in E-215 faculty cabin

Paradigm-1: Procedural Approach

1. Procedure → Data
2. Procedure → Data
3. Procedure → Data
4. Procedure → Data

▪

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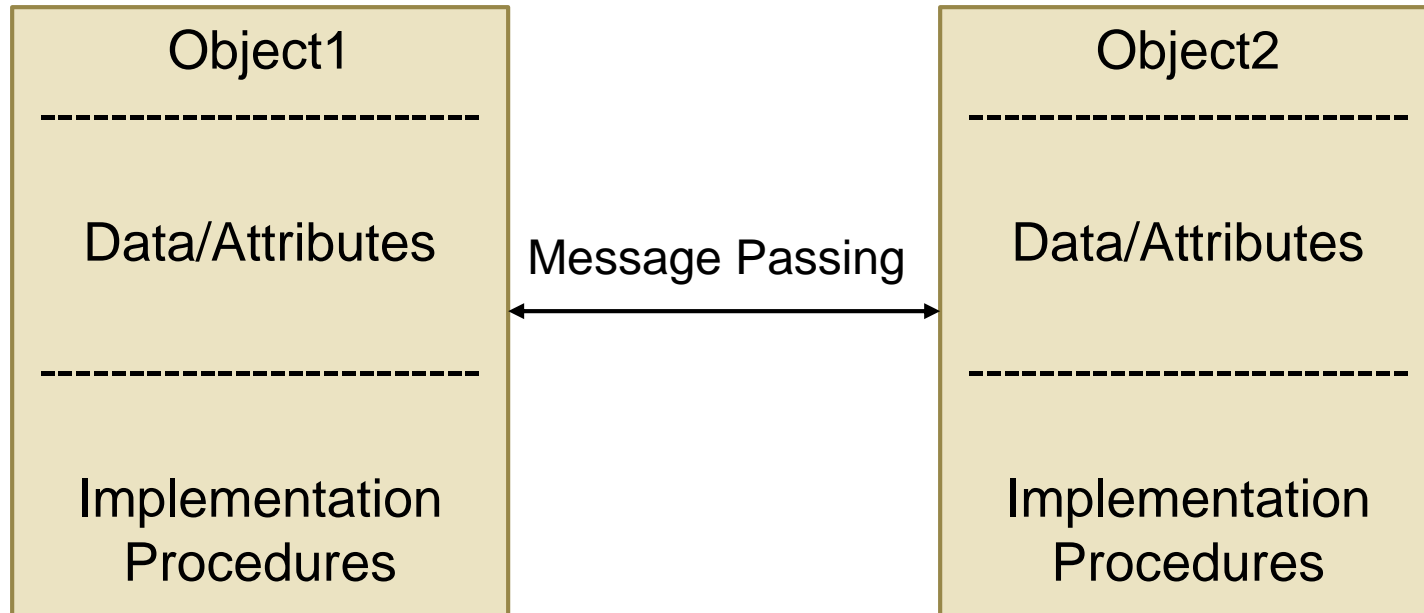
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Assembly line –sequential tasks

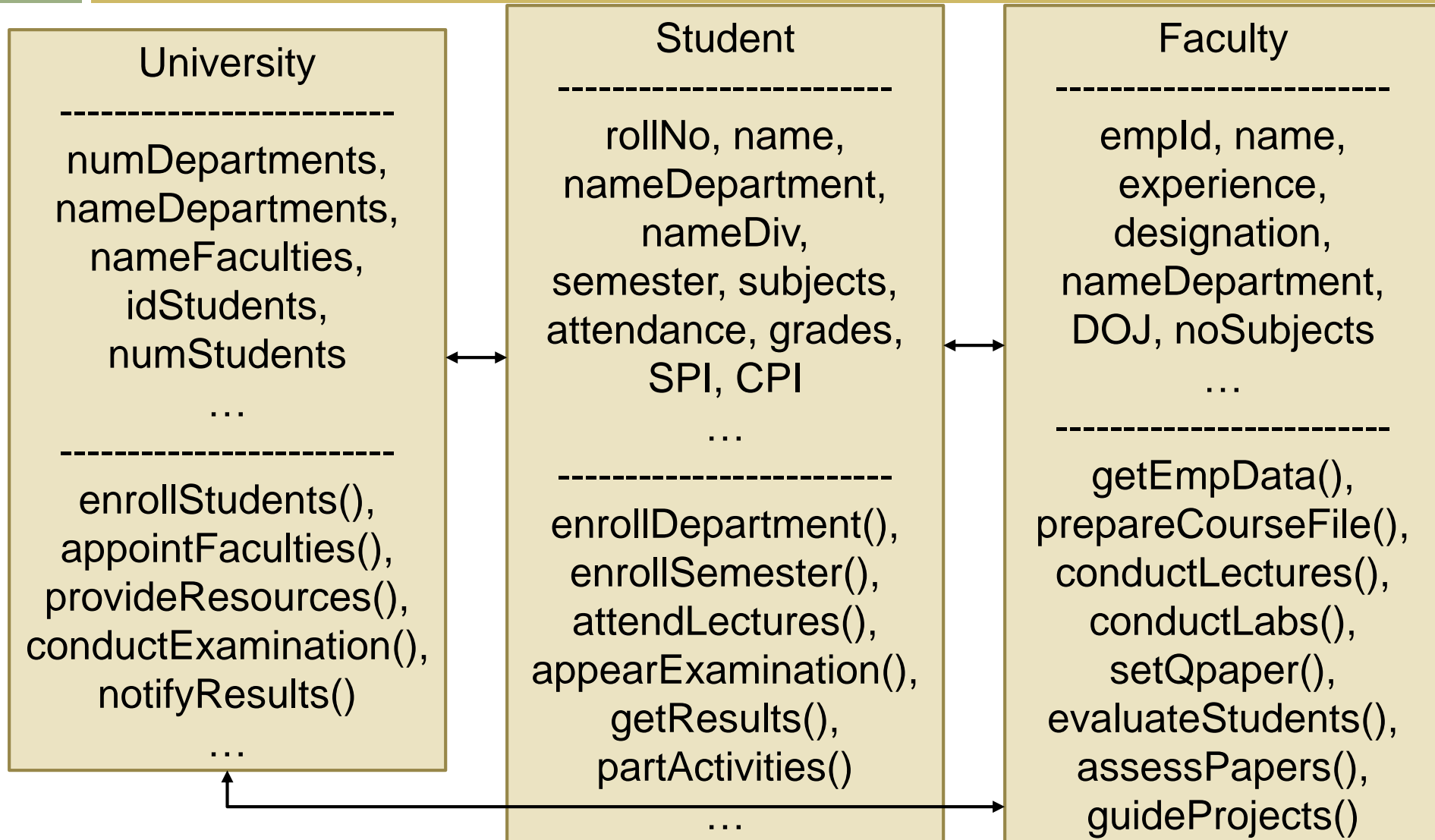
Procedural Approach-Example

- Teaching process
 - ▣ Students take admission in department of university
 - ▣ Faculties take lectures and labs and evaluate students
 - ▣ Students attend lectures and labs
 - ▣ Students participate in different events
 - ▣ Students attend workshops
 - ▣ At the end of semester, university conducts exam
 - ▣ Faculties set questions papers
 - ▣ Students appear for the examination under Faculties' supervision
 - ▣ Faculties evaluate answersheets
 - ▣ Faculties conduct practical evaluation
 - ▣ University generate the results (SPI and CPI of students)
 - ▣ University considers performance appraisal of faculties

Paradigm-2: Object Oriented Approach



Object Oriented Approach- Example



Applications of Java

- ❑ Mobile Applications (Twitter, Minecraft)
- ❑ Desktop GUI Applications
- ❑ Web-based Applications
- ❑ Enterprise Applications
- ❑ Scientific Applications
- ❑ Gaming Applications
- ❑ Big Data Technologies
- ❑ Business Applications
- ❑ Distributed Applications
- ❑ Cloud-based Applications