



Course Data Sheet

Academic Year: 2018-2019, Even Semester

| | |
|---------------------------------------|--|
| Program: ECE | Degree: B.Tech |
| Course: Object oriented programming | Semester: 6th Credits: 3 |
| Course Code: EC605A | Course Type: Elective |
| Course Area/Domain: Programming | Contact Hours: 3L Hours/Week |
| Corresponding Lab Course Code: EC695A | Lab Course Name: Object oriented programming lab |

Course Pre-Requisites:

| Course Code | Course Name | Description | Sem |
|-------------|---------------------------|--|-----|
| CS201 | Introduction to Computing | Basic computation & Principles of computer programming | 2 |
| EC 504B | Data Structure & C | Linear & Non- linear data structure using C | 5 |

Course Objectives:

The purpose of this course is to

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|---|--|
| 1 | Gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc |
| 2 | Understand the fundamentals of object-oriented programming in Java, including defining classes, objects, invoking methods etc and exception handling mechanisms. |
| 3 | Understand the principles of inheritance, packages and interfaces |

Course Outcomes:

After successfully completing the course, students should be able to

| CO | Description | Cognitive Level |
|-----|---|-----------------|
| CO1 | Explain fundamentals of Object Oriented Programming paradigm | Understand |
| CO2 | Analyze the differences and advantages of Object Oriented Programming with conventional programming | Analyze |
| CO3 | Apply concept of class, object and various String handling functions using Java | Apply |
| CO4 | Implement reusability property OOPs using Java | Apply |
| CO5 | Use exception handling & multithreading to solve various problems | Apply |
| CO6 | Write Applet programming to solve real life problems | Create |

Course Outcomes (CO) to Program Outcomes (PO) & Program Specific Outcomes (PSO) mapping:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | 1 | 2 | 2 | - | - | - | - | - | - | - | - | - | - | 1 |
| CO2 | 1 | 2 | 2 | - | - | - | - | - | - | - | - | - | - | 1 |
| CO3 | 1 | 2 | 2 | - | - | - | - | - | - | - | - | 1 | - | 1 |
| CO4 | 1 | 2 | 2 | - | - | - | - | - | - | - | - | 1 | - | 1 |
| CO5 | 1 | 2 | 2 | 1 | - | - | - | - | - | - | - | 1 | - | 1 |
| CO6 | 1 | 2 | 2 | 2 | - | - | - | - | - | - | - | 1 | - | 1 |

Note: Correlation levels are as defined: 1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High).

If there is no correlation, put “-”

POs & PSO Reference:

| | | | | | |
|-----|--|------|--------------------------------|------|---|
| PO1 | Engineering knowledge | PO7 | Environment and sustainability | PSO1 | Students will acquire knowledge in Advance Communication Engineering, Signal and Image Processing, Embedded and VLSI System Design. |
| PO2 | Problem analysis | PO8 | Ethics | | |
| PO3 | Design/development of solutions | PO9 | Individual and team work: | | |
| PO4 | Conduct investigations of complex problems | PO10 | Communication | PSO2 | Students will qualify in various competitive examinations for successful employment, higher studies and research. |
| PO5 | Modern tool usage | PO11 | Project management and finance | | |
| PO6 | The engineer and society | PO12 | Life-long learning | | |

GAPS WITHIN SYLLABUS -

| S. No. | Topic | Proposed Actions | CO | PO | PSO |
|--------|---------------|---|-----|-----|------|
| 1 | Wrapper class | Within class session discuss this topic | CO3 | PO3 | PSO2 |

TOPICS BEYOND SYLLABUS/ADVANCED TOPICS/DESIGN:

| S. No. | Topic | Proposed Actions | PO | PSO |
|--------|------------------------|--|-----|------|
| | Data base connectivity | Using Micro project student will learn to connect with database. | PO5 | PSO2 |

WEB SOURCE REFERENCES:

| | |
|---|------------------------|
| 1 | www.tutorialspoint.com |
| 2 | www.javatpoint.com |
| 3 | www.nptel.ac.in |

DELIVERY/INSTRUCTIONAL METHODOLOGIES:

| | | | |
|--|--|---|--|
| <input checked="" type="checkbox"/> CHALK & TALK | <input checked="" type="checkbox"/> STUD. ASSIGNMENT | <input checked="" type="checkbox"/> WEB RESOURCES | <input checked="" type="checkbox"/> NPTEL/OTHERS |
| <input type="checkbox"/> LCD/SMART BOARDS | <input type="checkbox"/> STUD. SEMINARS | <input type="checkbox"/> ADD-ON COURSES | <input type="checkbox"/> WEBNIARS |

ASSESSMENT METHODOLOGIES-DIRECT

| | | | |
|---|--|---|---|
| <input checked="" type="checkbox"/> ASSIGNMENTS | <input type="checkbox"/> STUD. SEMINARS | <input checked="" type="checkbox"/> TESTS/MODEL EXAMS | <input checked="" type="checkbox"/> UNIV. EXAMINATION |
| <input type="checkbox"/> STUD. LAB PRACTICES | <input checked="" type="checkbox"/> STUD. VIVA | <input type="checkbox"/> MINI/MAJOR PROJECTS | <input type="checkbox"/> CERTIFICATIONS |
| <input type="checkbox"/> ADD-ON COURSES | <input type="checkbox"/> OTHERS | | |

ASSESSMENT METHODOLOGIES-INDIRECT

| | |
|---|--|
| <input checked="" type="checkbox"/> ASSESSMENT OF COURSE OUTCOMES (BY FEEDBACK, ONCE) | <input type="checkbox"/> STUDENT FEEDBACK ON FACULTY |
| <input type="checkbox"/> ASSESSMENT OF MINI/MAJOR PROJECTS BY EXT. EXPERTS | <input type="checkbox"/> OTHERS |



SYLLABUS WITH COURSE STRUCTURE

Object Oriented Programming

Code: EC605A

Contact: 3L

Credits: 3

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|--|-------------|
| Object oriented design | 10 L |
| Concepts of object oriented programming language, Major and minor elements, Object, Class, relationships among objects, aggregation, links, relationships among classes -association, aggregation, using, instantiation, meta-class, grouping constructs. | |
| Object oriented concepts | 4L |
| Difference between OOP and other conventional programming – advantages and disadvantages. Class, object, message passing, inheritance, encapsulation, polymorphism | |
| Basic concepts of object oriented programming using Java | 22L |
| Class & Object properties | 6L |
| Basic concepts of java programming – advantages of java, byte-code & JVM, data types, access specifiers, operators, control statements & loops, array, creation of class, object, constructor, finalize and garbage collection, use of method overloading, this keyword, use of objects as parameter & methods returning objects, call by value & call by reference, static variables & methods, garbage collection, nested & inner classes, basic string handling concepts- String (discuss charAt() , compareTo(), equals(), equalsIgnoreCase(), indexOf(), length() , substring(), toCharArray() , toLowerCase(), toString(), toUpperCase() , trim() , valueOf() methods) & StringBuffer classes (discuss append(), capacity(), charAt(), delete(), deleteCharAt(), ensureCapacity(), getChars(), indexOf(), insert(), length(), setCharAt(), setLength(), substring(), toString() methods), concept of mutable and immutable string, command line arguments, basics of I/O operations – keyboard input using BufferedReader & Scanner classes. | |
| Reusability properties | 6L |
| Super class & subclasses including multilevel hierarchy, process of constructor calling in inheritance, use of super and final keywords with super() method, dynamic method dispatch, use of abstract classes & methods, interfaces. Creation of packages, importing packages, member access for packages. | |
| Exception handling & Multithreading | 6L |
| Exception handling basics, different types of exception classes, use of try & catch with throw, throws & finally, creation of user defined exception classes. Basics of multithreading, main thread, thread life cycle, creation of multiple threads, thread priorities, thread synchronization, inter-thread | |

communication, deadlocks for threads, suspending & resuming threads.

Applet Programming (using swing)

4L

Basics of applet programming, applet life cycle, difference between application & applet programming, parameter passing in applets, concept of delegation event model and listener, I/O in applets, use of repaint(), getDocumentBase(), getCodeBase() methods, layout manager (basic concept), creation of buttons (JButton class only) & text fields.

Textbooks/References:

1. Rambaugh, James Michael, Blaha – "Object Oriented Modelling and Design" – Prentice Hall, India
2. Ali Bahrami – "Object Oriented System Development" – Mc Graw Hill
3. Patrick Naughton, Herbert Schildt – "The complete reference-Java2" – TMH 4. R.K Das – "Core Java For Beginners" – VIKAS PUBLISHING
5. Deitel and Deitel – "Java How to Program" – 6th Ed. – Pearson
6. Ivor Horton's Beginning Java 2 SDK – Wrox
7. E. Balagurusamy – " Programming With Java: A Primer" – 3rd Ed. – TMH



B.P. PODDAR INSTITUTE OF MANAGEMENT AND TECHNOLOGY

Approved by A.I.C.T.E New Delhi & Affiliated to MAKAUT, West Bengal

Department of Electronics & Communication Engineering

LESSON PLAN

Stream : B.Tech/ECE-3rd Year

Subject: Object Oriented Programming

Subject Code : EC605A AY: 2018-19

| L.No | Description | Refere nce | Teaching Methodology | Teaching Aids |
|------|--|------------|----------------------------------|------------------|
| 1 | Concepts of object oriented programming language, Major and minor elements | T1 | Lecture | PPT |
| 2 | Concepts of object oriented programming language, Major and minor elements | T1 | Lecture | PPT |
| 3 | Object, Class | T1 | Lecture | PPT |
| 4 | Relationships among objects- Aggregation, links | T1 | Lecture | PPT |
| 5 | Relationships among objects- Aggregation, links | T1 | Lecture | PPT |
| 6 | Relationships among classes -association, aggregation, | T1 | Lecture | PPT |
| 7 | Relationships among classes -association, aggregation, | T1 | Lecture | PPT |
| 8 | Relationships among classes - using, instantiation | T1 | Lecture | PPT |
| 9 | Relationships among classes - using, instantiation | T1 | Lecture | PPT |
| 10 | Meta-class, grouping constructs. | T1 | Lecture | PPT |
| 11 | Difference between OOP and other conventional programming – advantages and disadvantages. | T2 | Lecture | White board, PPT |
| 12 | Class, object, message passing | T2 | Lecture | PPT |
| 13 | Inheritance | T2 | Lecture/Disc ussion, Tit for Tat | White board, PPT |
| 14 | Encapsulation, Polymorphism | T2 | Lecture, LMS | White board, PPT |
| 15 | Basic concepts of java programming – advantages of java, byte-code & JVM, data types, access specifiers, | T3 | Lecture | White board, PPT |
| 16 | operators, control statements & loops, array, creation of class, object, constructor, | T3 | Lecture, LMS | White board, PPT |
| 17 | Finalize and garbage collection, use of method overloading, this keyword, use of objects as parameter & methods returning objects | T3 | Lecture, LMS | White board, PPT |
| 18 | Call by value & call by reference, static variables & methods, garbage collection, nested & inner classes | T3 | Lecture/Disc ussion | White board, PPT |
| 19 | Basic string handling concepts- String (discuss charAt() , compareTo(), equals(), equalsIgnoreCase(), indexOf(), length() , substring(), toCharArray() , toLowerCase(), toString(), toUpperCase() , trim() , valueOf() methods) & StringBuffer classes (discuss append(), capacity(), charAt(), delete(), deleteCharAt(), ensureCapacity(), getChars(), indexOf(), insert(), length(), setCharAt(), setLength(), substring(), toString() methods), concept of mutable and immutable string | T3 | Lecture/Disc ussion | White board, PPT |

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|----|--|----|-------------------------|------------------|
| 20 | Command line arguments, basics of I/O operations – keyboard input using BufferedReader & Scanner classes | T3 | Lecture/Discussion, LMS | White board, PPT |
| 21 | Super class & sub-classes including multilevel hierarchy | T3 | Lecture/Discussion | White board, PPT |
| 22 | Process of constructor calling in inheritance, use of super and final keywords with super() method | T3 | Lecture/Discussion | White board, PPT |
| 23 | Dynamic method dispatch, use of abstract classes & methods | T3 | Lecture/Discussion | White board, PPT |
| 24 | Interfaces | T3 | Lecture, LMS | White board, PPT |
| 25 | Creation of packages, importing packages | T3 | Lecture | White board, PPT |
| 26 | Member access for packages | T3 | Lecture | White board, PPT |
| 27 | Exception handling basics, different types of exception classes, use of try & catch with throw, throws & finally, creation of user defined exception classes | T3 | Lecture, LMS | White board, PPT |
| 28 | Basics of multi - threading, main thread, thread life cycle | T3 | Lecture | White board, PPT |
| 29 | Creation of multiple threads, thread priorities | T3 | Lecture | White board, PPT |
| 30 | Thread synchronization, inter-thread communication | T3 | Lecture | White board, PPT |
| 31 | Deadlocks for threads | T3 | Lecture | White board, PPT |
| 32 | Suspending & resuming threads | T3 | Lecture | White board, PPT |
| 33 | Basics of applet programming, applet life cycle, difference between application & applet programming | T3 | Lecture, LMS | White board, PPT |
| 34 | Parameter passing in applets, concept of delegation event model and listener | T3 | Lecture/Discussion | White board, PPT |
| 35 | I/O in applets, use of repaint(), getDocumentBase(), getCodeBase() methods | T3 | Lecture/Discussion | White board, PPT |
| 36 | Layout manager (basic concept), creation of buttons (JButton class only) & text fields | T3 | Lecture, LMS | White board, PPT |

Text Books:

| | |
|---|--|
| 1 | Rambaugh, James Michael, Blaha – "Object Oriented Modelling and Design" – Prentice Hall, India |
| 2 | Ali Bahrami – "Object Oriented System Development" – Mc Graw Hill |
| 3 | Patrick Naughton, Herbert Schildt – "The complete reference-Java2" – TMH |
| 4 | Ivor Horton's Beginning Java 2 SDK – Wrox |

Faculty Sign