

COURSE CODE	COURSE NAME	L-T-P-C	YEAR OF INTRODUCTION
EC312	Object Oriented Programming	3-0-0-3	2016
Prerequisite: NIL			
Course objectives: <ul style="list-style-type: none"> To introduce the Object Oriented Programming paradigm using C++ and Java as the languages. To learn simple Android application development from the fundamentals. 			
Syllabus: Object Oriented Programming and basics of C++, Advanced features of C++ programming such as exception handling and templates. Object oriented features of Java and their implementation. Advanced features of Java including packages, multithreading and error management. Introduction to Android application development with a case study.			
Expected outcome: The students will have: <ol style="list-style-type: none"> A thorough understanding of the features of OOP like class construction, polymorphism and inheritance of C++ and Java. An understanding of advanced features of C++ such as templates, abstract classes and virtual functions. Knowledge of advanced features of Java such as multithreading, packages and error management. Skills in designing android application development. Skills in debugging, deploying and testing mobile applications. 			
Text Books: <ol style="list-style-type: none"> E. Balagurusamy, Object Oriented Programming with C++ and JAVA, McGrawHill, 2015 Hardy, Brian, and Bill Phillips, Android Programming: The Big Nerd Ranch Guide. Addison-Wesley Professional, 2013. Yashwant P. Kanetkar, Let us C++, 2/e, BPB Publications, 2003 			
References: <ol style="list-style-type: none"> Deitel, Harvey M., and Paul J. Deitel., Java how to program.,7th International edition.” (2007): 390-420. G. Booch, R. A. Maksimchuk, M. W. Engel, and B J. Young, Object-oriented Analysis and Design with Applications, Addison-Wesley, 3rd Edition, 2007. Horstmann, Cay S., and Gary Cornell., Core Java 2: Volume I, Fundamentals, Pearson Education, 2002. Samanta, Debasis, Object-Oriented programming with C++ and Java, PHI Learning Pvt. Ltd., 2006. Stroustrup, Bjarne. The C++ programming language, Pearson Education India, 1986. www.tutorialspoint.com/android/android_tutorial.pdf 			

Course Plan			
Module	Course content	Hours	End Sem. Exam Marks
I	Concepts of OOP – Introduction to OOP, Procedural Vs. Object Oriented Programming, Principles of OOP, Benefits and applications of OOP.	2	15
	Beginning with C++: Overview and Structure of C++ Program, Classes and Objects, Constructors and Destructors.	4	
II	Operator Overloading and Inheritance – Overloading Unary Operators, Overloading Binary Operators, Overloading Binary Operators using Friends, Manipulation of Strings Using Operators.	4	15
	Inheritance – Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance. Virtual Base Classes, Abstract Classes, Constructors in Derived Classes, Member Classes: Nesting of Classes	5	
FIRST INTERNAL EXAM			
III	Virtual Functions and Polymorphism – Pointers to objects, this pointer, Pointers to derived classes, Virtual functions, Virtual Constructors and Destructors.	6	15
IV	Programming with JAVA – Overview of Java Language, Classes Objects and Methods, Method Overloading and Inheritance, Overriding Methods, Final Variables and Methods. Interfaces, Packages, Multithreaded programming, Managing Errors and Exceptions.	8	15
SECOND INTERNAL EXAM			
V	Introduction to Android : Setting up Development Environment, Basic Building blocks – Activities, Services, Broadcast Receivers & Content providers, UI Components – Views & notifications, Components for communication – Intents & Intent Filters,	6	20
VI	Application Structure-Android Manifest.xml, uses-permission & uses-sdk, Layouts & Drawable Resources, First sample Application, Emulator-Android Virtual Device, Basic UI design, Styles & Themes, Content Providers-SQLite Programming, Case study –Develop an App to demonstrate database usage.	7	20
END SEMESTER EXAM			

Assignment:

1. Assignment for implementing virtual base class in C++ related to some application.
2. Assignment for implementing a simple interactive applet in Java (eg: calculator)
3. A group assignment on simple android mobile app (eg: managing students' details and rank calculation of a class).

Question Paper Pattern (End semester exam)

Maximum marks : 100

Time : 3 hours

The question paper shall consist of three parts. Part A covers modules I and II, Part B covers modules III and IV, and Part C covers modules V and VI. Each part has three questions uniformly covering the two modules and each question can have maximum four subdivisions. In each part, any two questions are to be answered. Mark patterns are as per the syllabus with 60 % for theory and 40% for logical/numerical problems, derivation and proof.

