

UNIVERSITY OF MUMBAI

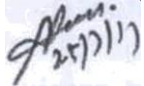
No. UG/ J>Tif 2017

CIRCULAR:-

A reference is **invited** to the Syllabi relating to the B.Sc. degree course, vide this office Circular No. UG/42 of 2016-17, dated 5th August, 2016 and the Principals of the affiliated Colleges in Science are hereby informed that the recommendation made by Ad-hoc-Board of Studies Ln Computer Science at its meeting held on **5/5/2017** has been accepted by the Academic Council at its meeting held on 11.5.2017 vide item No. 4.210 and that in accordance therewith, in revised syllabus as per the Credit Based Semester and Grading System for S.Y.B.Sc Computer Science (Sem III & IV) which is available on the University's website (www.mu.ac.in) and that the same has been brought into force with effect from the academic year 2016-17.

MUMBAI — 400 032

July, 2017


REGISTRAR

To,

The Principal of the affiliated Colleges in Science and the Head of Recognized Institutions concerned.

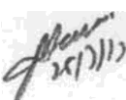
A.C/4.210/11.05.2017

>>Io. UG/)bJ- A of 2017 .M AJ-40*0 032

२३th July, 2017

Copy forwarded with compliments for inTorr•.a.tion to

- 1) The Co-ordinator, Faculty of Science.,
- 2) The Offg. Director of Board of Examinations and Evaluation,
- 3) The Chairperson, Board of Studies in Botar.y,
- 4) The Director of Board of Studies Development.
- 5) The Professor-cum-Director, Ir.stitute of Distance and Open Leamlng.
- 6) The Co-Ordinator, University Cen.puierization Centre.



.... PTO

UNIVERSITY OF MUMBAI



**Syllabus for SemIII
Program: B.Sc.
Course: Computer Science**

(Credit Based Semester and Grading System with
effect from the academic year 2017-2018)

Preamble

The revised and restructured curriculum for the Three-year integrated course is systematically designed considering the current industry needs in terms of skills sets demanded under new technological environment. It also endeavours to align the programme structure and course curriculum with student aspirations and corporate expectations. The proposed curriculum is more contextual, industry affable and suitable to cater the needs of society and nation in present day context.

Second year of this course is about studying core computer science subjects. Theory of Computation course provides understanding of grammar, syntax and other elements of modern language designs. It also covers developing capabilities to design formulations of computing models and its applications in diverse areas.

The course in Operating System satisfies the need of understanding the structure and functioning of system. Programming holds key indispensable position in any curriculum of Computer Science. It is essential for the learners to know how to use object oriented paradigms. There is also one dedicated course Android Developer Fundamentals as a skill enhancement catering to modern day needs of Mobile platforms and applications. The syllabus has Database Systems courses in previous semesters. The course in Database Management Systems is its continuation in third semester. The course has objectives to develop understanding of concepts and techniques for data management along with covers concepts of database at advance level.

The course of Combinatorics and Graph Theory in third semester and the course of Linear Algebra in fourth semester take the previous courses in Mathematics. Graph theory is rapidly moving into the mainstream mainly because of its applications in diverse fields which include can further open new opportunities in the areas of genomics, communications networks and coding theory, algorithms and computations and operations research.

Introducing one of the upcoming concepts Physical Computing and IoT programming will definitely open future area as Embedded Engineer, involvement in IoT projects, Robotics and many more. The RasPi is a popular platform as it offers a complete Linux server in a tiny platform for a very low cost and custom-built hardware with minimum complex hardware builds which is easier for projects in education domain.

S.Y.B.Sc. (Semester III and IV)
Computer Science Syllabus
Credit Based Semester and Grading System
To be implemented from the Academic year 2017-2018

SEMESTER III			
Course	TOPICS	Credits	L / Week
USCS301	Theory of Computation	2	3
USCS302	Core JAVA	2	3
USCS303	Operating System	2	3
USCS304	Database Management Systems	2	3
USCS305	Combinatorics and Graph Theory	2	3
USCS306	Physical Computing and IoT Programming	2	3
USCS307	Skill Enhancement: Web Programming	2	3
USCSP301	USCS302+USCS303+USCS304	3	9
USCSP302	USCS305+USCS306+USCS307	3	9

SEMESTER IV			
Course	TOPICS	Credits	L / Week
USCS401	Fundamentals of Algorithms	2	3
USCS402	Advanced JAVA	2	3
USCS403	Computer Networks	2	3
USCS404	Software Engineering	2	3
USCS405	Linear Algebra using Python	2	3
USCS406	.NET Technologies	2	3
USCS407	Skill Enhancement: Android Developer Fundamentals	2	3
USCSP401	USCS401+ USCS402+ USCS403	3	9
USCSP402	USCS405+ USCS406+ USCS407	3	9

SEMESTER III

THEORY

Course: USCS302	TOPICS (Credits : 02 Lectures/Week:03) Core Java	
Objectives: The objective of this course is to teach the learner how to use Object Oriented paradigm to develop code and understand the concepts of Core Java and to cover-up with the pre-requisites of Core java.		
Expected Learning Outcomes:		
<ol style="list-style-type: none"> 1. Object oriented programming concepts using Java. 2. Knowledge of input, its processing and getting suitable output. 3. Understand, design, implement and evaluate classes and applets. 4. Knowledge and implementation of AWT package. 		
Unit I	<p>The Java Language: Features of Java, Java programming format, Java Tokens, Java Statements, Java Data Types, Typecasting, Arrays</p> <p>OOPS: Introduction, Class, Object, Static Keywords, Constructors, this Key Word, Inheritance, super Key Word, Polymorphism (overloading and overriding), Abstraction, Encapsulation, Abstract Classes, Interfaces</p> <p>String Manipulations: String, String Buffer, String Tokenizer</p> <p>Packages: Introduction to predefined packages (java.lang, java.util, java.io, java.sql, java.swing), User Defined Packages, Access specifiers</p>	15L
Unit II	<p>Exception Handling: Introduction, Pre-Defined Exceptions, Try-Catch-Finally, Throws, throw, User Defined Exception examples</p> <p>Multithreading: Thread Creations, Thread Life Cycle, Life Cycle Methods, Synchronization, Wait() notify() notify all() methods</p> <p>I/O Streams: Introduction, Byte-oriented streams, Character- oriented streams, File, Random access File, Serialization</p> <p>Networking: Introduction, Socket, Server socket, Client –Server Communication</p>	15L
	<p>Wrapper Classes: Introduction, Byte, Short, Integer, Long, Float, Double, Character, Boolean classes</p> <p>Collection Framework: Introduction, util Package interfaces, List, Set, Map, List interface & its classes, Set interface & its classes, Map interface & its classes</p>	

Unit III	<p>Inner Classes: Introduction, Member inner class, Static inner class, Local inner class, Anonymous inner class</p> <p>AWT: Introduction, Components, Event-Delegation-Model, Listeners, Layouts, Individual components Label, Button, CheckBox, Radio Button, Choice, List, Menu, Text Field, Text Area</p>	15L
<p>Textbook(s):</p> <p>1) Herbert Schildt, Java The Complete Reference, Ninth Edition, McGraw-Hill Education, 2014</p> <p>Additional Reference(s):</p> <p>1) E. Balagurusamy, Programming with Java, Tata McGraw-Hill Education India, 2014</p> <p>2) Programming in JAVA, 2nd Ed, Sachin Malhotra & Saurabh Choudhary, Oxford Press</p> <p>3) The Java Tutorials: http://docs.oracle.com/javase/tutorial/</p>		

Suggested List of Practical- SEMESTER III

Course: USCSP301	<p>(Credits : 03 Lectures/Week: 09)</p> <p>USCS302+ USCS303+USCS304</p>	
USCS302: Core JAVA		
<ol style="list-style-type: none"> 1. Accept integer values for a, b and c which are coefficients of quadratic equation. Find the solution of quadratic equation. 2. Accept two n x m matrices. Write a Java program to find addition of these matrices. 3. Accept n strings. Sort names in ascending order. 4. Create a package: Animals. In package animals create interface Animal with suitable behaviors. Implement the interface Animal in the same package animals. 5. Demonstrate Java inheritance using extends keyword. 6. Demonstrate method overloading and method overriding in Java. 7. Demonstrate creating your own exception in Java. 8. Using various swing components design Java application to accept a student's resume. (Design form) 9. Write a Java List example and demonstrate methods of Java List interface. 10. Design simple calculator GUI application using AWT components. 		

Evaluation Scheme

I. Internal Exam - 25 Marks

(i) Test – 20 Marks

20 marks Test – Duration 40 mins

It will be conducted either using any open source learning management system like Moodle (Modular object-oriented dynamic learning environment)

OR

A test based on an equivalent online course on the contents of the concerned course (subject) offered by or build using MOOC (Massive Open Online Course) platform.

(ii) 5 Marks – Active participation in routine class instructional deliveries

Overall conduct as a responsible student, manners, skill in articulation, leadership qualities demonstrated through organizing co-curricular activities, etc.

II. External Exam– 75 Marks

III. Practical Exam – 50 Marks

- Each course carry 50 Marks : 40 marks + 05 marks (journal) + 05 marks (viva)
- Minimum 75 % practical from each paper are required to be completed and written in the journal.

(Certified Journal is compulsory for appearing at the time of Practical Exam)
