

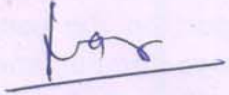
UNIVERSITY OF MUMBAI

No. UG/336 of 2018

CIRCULAR:-

Attention of the Head, University Department of Nano Science and Nano Technology and the Principals of the affiliated Colleges in Science and the recognized Science Institutions is invited to this office Circular No. UG/259 of 2006 dated 17th July, 2006 relating to syllabus of the M.Sc. in Nano-Sciences and Nano-Technology (Sem. I & II). They are hereby informed that the recommendations made by Board of Studies in Nano-Sciences and Nano-Technology at its meeting held on 29th November, 2017 have been accepted by the Academic Council at its meeting held on 11th December 2017 **vide** item No.4.4 and that in accordance therewith, the revised syllabus of M.Sc. in Nano-Sciences and Nano-Technology (Sem. I & II), has been brought into force with effect from the academic year 2017-18, accordingly. The same is available on the University's website: www.mu.ac.in.

MUMBAI – 400 032
8th February, 2018
To


(Dr. Dinesh Kamble)
I/c REGISTRAR

The Head University Department of Nano-Sciences and Nano-Technology and the Principals of the affiliated Colleges in Science and the recognized Science Institutions.

A.C/4.4/11/12/2017

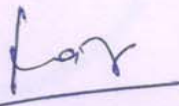
No. UG/336-A of 2018

MUMBAI-400 032

8th February, 2018

Copy forwarded with Compliments for information to:-

- 1) The Co-ordinator, Faculty of Science & Technology,
- 2) The Director, Board of Examinations and Evaluation,
- 3) The Director, Board of Students Development,
- 4) The Co-Ordinator, University Computerization Centre,


(Dr. Dinesh Kamble)
I/c REGISTRAR

Academic Council _____

Item No: _____

UNIVERSITY OF MUMBAI



SYLLABUS OF BRIDGE COURSE IN COMPUTER SCIENCE

Program: Leading to S.Y.B.Sc. In Computer Science

With effect from
Academic Year 2017-2018

Bridge Course in Computer Science Syllabus
Credit Based Semester and Grading System
to be implemented from the Academic year 2017-2018

Course	TOPICS	Credits	L / Week
USCSBC01	Bridge Course : Paper I	02	03
USCSBCP302	Practical	01	03

Theory	Bridge Course : Paper I (Credits : 02 and Lectures /Week : 03)	(45L)
Unit I	<p><u>Introduction to Probability</u> Introduction: Random experiment, sample space, events types and operations of events Probability definition: classical, axiomatic, Elementary Theorems of probability (without proof), Conditional probability, ‘Bayes’ theorem, independence. Standard distributions: random variable; discrete, continuous, expectation and variance of a random variable, pmf, pdf, cdf. Introduction to distributions: binomial, normal, chi-square, t, F.</p>	(15L)
Unit II	<p><u>FOSS</u> Introduction: Open Source, Free Software, Free Software v/s Open Source software, Public Domain Software, FOSS does not mean no cost. History: BSD, The Free Software Foundation and the GNU Project. Methodologies:Open Source History, Initiatives, Principle and methodologies. Philosophy: Software Freedom, Open Source Development Model Licenses and Patents: What Is A License, Important FOSS Licenses (Apache, BSD, GPL, and LGPL), copyrights and copy left. Case Studies Example Projects: GNU/Linux, Android, Mozilla (Firefox), Wikipedia, Wordpress, GCC, GDB, GitHub, Open Office. Study: Understanding the developmental models, licensing, mode of funding, commercial/non-commercial use. Open Source Hardware, Open Source Design, Open source Teaching, Open source media. <u>LINUX</u> Introduction:History of Linux, Philosophy, Community, Terminology, Distributions, Linux kernel vs distribution. Linux Structure: Linux Architecture, File system basics, , File manipulation utilities Command Line: Command line mode options, Shells, Basic Commands, General Purpose Utilities, Environment variables, Command aliases. Linux Documentation: man pages, GNU info, help command, More</p>	(15L)

	<p>documentation sources</p> <p>File Operations:File-system and its architecture, File types, File attributes, Working with files, Backup, compression</p> <p>Text editors:gedit, vi, vim, emacs, Graphics editors, Multimedia applications.</p> <p>Security:Understanding Linux Security, Uses of root, sudocommand, working with passwords.</p> <p>Networking Basic introduction to Networking, Network protocols: telnet, ftp etc., IP address, DNS, Transferring files.</p> <p>Basic Shell Scripting: Features and capabilities, Syntax, Constructs – conditional and looping, String manipulation, Boolean expressions, File tests, case structure</p>	
Unit III	<p>Data Structures</p> <p>Data Structures: Introduction: Data Structure and its importance</p> <p>Linked Structures: Introduction, Singly Linked List-Traversing, Searching, Prep ending and Removing Nodes, Bag ADT-Linked List Implementation.</p> <p>Stacks: Stack ADT, Implementing Stacks-Using Python List, Using Linked List, StackApplications-Balanced Delimiters, Evaluating Postfix Expressions.</p> <p>Queues: Queue ADT, Implementing Queue-Using Python List, Circular Array, UsingList, Priority Queues- Priority Queue ADT, Bounded and unbounded Priority Queues</p> <p>Advanced Linked List: Doubly Linked Lists-Organization and Operation, CircularLinked List-Organization and Operation,</p> <p>Recursion: Recursive Functions, Properties of Recursion, Its working, RecursiveApplications</p>	(15L)
	<p>References:</p> <ol style="list-style-type: none"> 1. Trivedi, K.S.(2001) : Probability, Statistics, Design of Experiments and Queuing theory, with applications of Computer Science, Prentice Hall of India, New Delhi 2. Unix Concepts and Applications by Sumitabha Das, Tata McGraw Hill Education, 2006 3. Data Structure and algorithm Using Python, Rance D. Necaise, 2016 Wiley India Edition 4. Data Structure and Algorithm in Python, Michael T. Goodrich, RobertomTamassia, M. H. Goldwasser, 2016 Wiley India Edition 	
Practicals	Paper I (Credits : 01 and Lectures /Week : 03)	
	<p><u>Introduction to Probability</u>(To be implemented using R)</p> <ul style="list-style-type: none"> • Frequency distribution and data presentation • Measures of central tendency • Data entry using, functions, c(), scan (), Creating vectors, Mathematical Operations: ** +/-/*/ / ^ , exp, log, log10, etc, creating vector of text type, useful functions: data, frame, matrix operations, seq(), split() etc. • Frequency distribution using cut(), table() <p><u>FOSS</u></p> <ol style="list-style-type: none"> 1. Learn at least three different open source licenses and create a brief 	

report about them.

- History of license
- Idea
- What problems does it solve?
- Detailed licensing model
- Which popular software's are released under this license?
- Any popular news associated with this license?
- Popularity
- Impact

2. Hands on with Open Source Software

- Identify any open source software of your interest
- Learn it from practical view-point
- Give a brief presentation about it to the class
- Sample projects: gcc, gdb, drupal, wordpress, apache web server, mysql database..

Linux

1.Linux Installation

- Install your choice of Linux distribution e.g. Ubuntu, Fedora, Debian.
- Try different installation media like CD/DVD, USB Drive to install.
- Customize desktop environment by changing different default options like changing default background, themes, and screensavers.

2. Basic Linux commands: File and directory related commands

Data Structures

- Implement Linked list and demonstrate the functionality to add and delete items in the linked list.
- Implement working of Stacks. (pop method to take the last item added off the stack and a push method to add an item to the stack).
- Recursive implementation of
 - a. Factorial
 - b. Fibonacci
 - c. Tower of Hanoi

Evaluation Scheme

I. Internal Exam-25 Marks

(i) Test– 20 Marks

20 marks Test – Duration 40 minutes

Weightage per topic should be 5 marks for the test. It will be conducted either using any open source learning management systemsuch as Moodle (Modular object-oriented dynamic learning environment) or a testbased on an equivalent online course on the contents of the concernedcourse (subject) offered by or build using MOOC (Massive Open OnlineCourse) platform.

(ii) 5 Marks - Active participation in routine class instructional deliveriesOverall conduct as a responsible student, manners, skill in articulation,leadership qualities demonstrated through organizing co-curricularactivities, etc.

II. External Examination- 75 Marks

(i) Duration - 2.5 Hours.

(ii) Theory question paper pattern:-

All questions are compulsory.

Question Based on Marks

Q.1 Unit I: 20

Q.2 Unit II: 20

Q.3 Unit III: 20

Q.4 Unit I, II and III: 15

III. Practical Examination – 50 marks

50 Marks: 40 marks + 05 marks (journal) + 05marks (viva)

- Minimum any two practical's from each section are required to be completed and written in the journal.

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