Academic Council
Item No: _____

UNIVERSITY OF MUMBAI

Syllabus for M.sc. Part I
Program: M.Sc.
Subject: Information Technology

(Credit Based Semester and Grading System with effect from Academic Year 2019-2020)

Preamble

This is the first year (part I) curriculum in the subject of Information Technology. The revised structure is designed to transform students into technically competent, socially responsible and ethical Computer Scienceprofessionals. In these Semesters we have made the advancements in the subject based on the previous Semesters Knowledge.

In the first year is important to develop the intelligence regarding to various industry trends. Second year of this course making basics strong related to specialized industry and automation trends in wide diversification in technology.

The proposed curriculum contains two semesters; each Semester contains Ability to apply the knowledge of Information Technology with recent trends aligned with research and industry. Making students capable to apply IT in the field of Computational Research, Soft Computing, Big Data Analytics, Data Science, Image Processing, Artificial Intelligence, Networking and Cloud Computing. Making students aware about socially acceptable technical solutions in the domains of Information Security, Machine Learning, Internet of Things and Embedded System, Infrastructure Services as specializations.

Proposed Curriculum contains challenging and varied subjects aligned with the current trend with the application of knowledge of Intellectual Property Rights, Cyber Laws and Cyber Forensics and various standards in interest of National Security and Integrity along with IT Industry, write effective project reports, research publications and content development and to work in multidisciplinary environment in the context of changing technologies.

In essence, the objective of this syllabus is to create a pool of technologically savvy, theoretically strong, innovatively skilled and ethically responsible generation of computer science professionals. Hope that the teacher and student community of University of Mumbai will accept and appreciate the efforts.

M.Sc. PART I

(Semester I and II)

Information Technology Syllabus
Credit Based Semester and Grading System
To be implemented from the Academic year 2019-2020

SEMESTER I			
Course	**TOPICS**	**Credits**	**L / Week**
PSIT101	Research in Computing	4	4
PSIT102	Data Science	4	4
PSIT103	Cloud Computing	4	4
PSIT104	Soft Computing Techniques	4	4
	Practical		
PSIT1P1	Research in Computing Practical	2	4
PSIT1P2	Data Science Practical	2	4
PSIT1P3	Cloud Computing Practical	2	4
PSIT1P4	Soft Computing Techniques Practical	2	4

SEMESTER II			
Course	**TOPICS**	**Credits**	**L / Week**
PSIT201	Big Data Analytics	4	4
PSIT202	Modern Networking	4	4
PSIT203	Microservices Architecture	4	4
PSIT204	Image Processing	4	4
	Practical		
PSIT2P1	Big Data Analytics Practical	2	4
PSIT2P2	Modern Networking Practical	2	4
PSIT2P3	Microservices Architecture Practical	2	4
PSIT2P4	Image Processing Practical	2	4

Suggested List of Practical- SEMESTER I

Course: **PSIT1P4**	**(Credits : 02 Lectures/Week: 04)**	

PSIT1P4: Soft Computing Techniques Practical

Practical shall be implemented using Python

No.	Name of the Practical
1	A. Design a simple linear neural network
	B. Calculate the output of neural net using both binary and bipolar sigmoidal function
2	A. Generate AND/NOT function using McCulloch-Pitts neural net.
	B. Generate XOR function using McCulloch-Pitts neural net.
3	A. Write a program to implement Hebb's rule.
	B. Write a program to implement of delta rule.
4	A. Write a program for Back Propagation Algorithm
	B. Write a program for error Backpropagation algorithm.
5	A. Write a program for Hopfield Network.
	B. Write a program for Radial Basis function
6	A. Kohonen Self organizing map
	B. Adaptive resonance theory
7	A. Write a program for Linear separation.
	B. Write a program for Hopfield network model for associative memory
8	A. Membership and Identity operators in, not in.
	B. Membership and Identity Operators is, is not
9	A. Find ratios using fuzzy logic
	B. Solve Tipping problem using fuzzy logic
10	A. Implementation of Simple genetic algorithm
	B. Create two classes: City and Fitness using Genetic algorithm

Scheme of Examination

1. **Theory:**

   I. **Internal 30 Marks :** (Any one of the following):

   a. Written Test

   OR

   b. SWAYAM (Advanced Course) of minimum 20 hours and certification exam completed

   OR

   c. NPTEL (Advanced Course) of minimum 20 hours and certification exam completed

   OR

   d. Valid International Certifications (Prometric, Pearson, Certiport, Coursera, Udemy and the like)

   e. One certification marks shall be awarded one course only. For four courses, the students will have to complete four certifications.

   II. 10 marks:

   The marks given out of 40 for publishing the research paper should be divided into four courses and should awarded out of 10 in each of the four courses.

   10 marks from every course coming to a total of 40 marks, shall be awarded on publishing of research paper in UGC approved Journal with plagiarism less than 10%. The marks can be awarded as per the impact factor of the journal, quality of the paper, importance of the contents published, social value.

2. **External Examination: 60 marks**

   As per university guideline.

3. **Practical and Project Examination:**

   The Marking Scheme for each of the Elective is given below:

   A Certified copy journal is essential to appear for the practical examination.

1	Practical Question 1	20
2	Practical Question 1	20
3	Journal	5
4	Viva Voce	5

OR

1	Practical Question 1	40
2	Journal	5
3	Viva Voce	5

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