

**Academic Council: 26/07/2019**

**Item No: 4.76**

**UNIVERSITY OF MUMBAI**



**Syllabus for M.Sc. Part I**  
**(Semester I and II)**

**Programme: M.Sc.**

**Subject: Information Technology**

(Choice Based Credit System with effect from  
the academic year 2019 – 2020)

<b>Semester – I</b>		
<b>Course Code</b>	<b>Course Title</b>	<b>Credits</b>
PSIT101	Research in Computing	4
PSIT102	Data Science	4
PSIT103	Cloud Computing	4
PSIT104	Soft Computing Techniques	4
PSIT1P1	Research in Computing Practical	2
PSIT1P2	Data Science Practical	2
PSIT1P3	Cloud Computing Practical	2
PSIT1P4	Soft Computing Techniques Practical	2
<b>Total Credits</b>		<b>24</b>

<b>Semester – II</b>		
<b>Course Code</b>	<b>Course Title</b>	<b>Credits</b>
PSIT201	Big Data Analytics	4
PSIT202	Modern Networking	4
PSIT203	Microservices Architecture	4
PSIT204	Image Processing	4
PSIT2P1	Big Data Analytics Practical	2
PSIT2P2	Modern Networking Practical	2
PSIT2P3	Microservices Architecture Practical	2
PSIT2P4	Image Processing Practical	2
<b>Total Credits</b>		<b>24</b>

## **Program Specific Outcomes**

PSO1: Ability to apply the knowledge of Information Technology with recent trends aligned with research and industry.

PSO2: Ability to apply IT in the field of Computational Research, Soft Computing, Big Data Analytics, Data Science, Image Processing, Artificial Intelligence, Networking and Cloud Computing.

PSO3: Ability to provide socially acceptable technical solutions in the domains of Information Security, Machine Learning, Internet of Things and Embedded System, Infrastructure Services as specializations.

PSO4: Ability to apply the knowledge of Intellectual Property Rights, Cyber Laws and Cyber Forensics and various standards in interest of National Security and Integrity along with IT Industry.

PSO5: Ability to write effective project reports, research publications and content development and to work in multidisciplinary environment in the context of changing technologies.

# **SEMESTER I**

<b>M. Sc (Information Technology)</b>		<b>Semester – I</b>	
<b>Course Name: Research in Computing</b>		<b>Course Code: PSIT101</b>	
<b>Periods per week</b> <b>1 Period is 60 minutes</b>	<b>Lectures</b>	<b>4</b>	
	<b>Credits</b>	<b>4</b>	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Theory Examination</b>	<b>2½</b>	<b>60</b>
	<b>Theory Internal</b>	<b>--</b>	<b>40</b>

<b>Objectives</b>	<ul style="list-style-type: none"> <li>To be able to conduct business research with an understanding of all the latest theories.</li> <li>To develop the ability to explore research techniques used for solving any real world or innovate problem.</li> </ul>
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<b>Pre requisites</b>	Basic knowledge of statistical methods. Analytical and logical thinking.
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<b>Unit</b>	<b>Details</b>	<b>Lectures</b>
<b>I</b>	<b>Introduction:</b> Role of Business Research, Information Systems and Knowledge Management, Theory Building, Organization ethics and Issues	<b>12</b>
<b>II</b>	<b>Beginning Stages of Research Process:</b> Problem definition, Qualitative research tools, Secondary data research	<b>12</b>
<b>III</b>	<b>Research Methods and Data Collection:</b> Survey research, communicating with respondents, Observation methods, Experimental research	<b>12</b>
<b>IV</b>	<b>Measurement Concepts, Sampling and Field work:</b> Levels of Scale measurement, attitude measurement, questionnaire design, sampling designs and procedures, determination of sample size	<b>12</b>
<b>V</b>	<b>Data Analysis and Presentation:</b> Editing and Coding, Basic Data Analysis, Univariate Statistical Analysis and Bivariate Statistical analysis and differences between two variables. Multivariate Statistical Analysis.	<b>12</b>

<b>Books and References:</b>					
<b>Sr. No.</b>	<b>Title</b>	<b>Author/s</b>	<b>Publisher</b>	<b>Edition</b>	<b>Year</b>
1.	Business Research Methods	William G.Zikmund, B.J Babin, J.C. Carr,	Cengage	8e	2016

		Atanu Adhikari, M.Griffin			
2.	Business Analytics	Albright Winston	Cengage	5e	2015
3.	Research Methods for Business Students Fifth Edition	Mark Saunders			2011
4.	Multivariate Data Analysis	Hair	Pearson	7e	2014

## Evaluation Scheme

### Internal Evaluation (40 Marks)

The internal assessment marks shall be awarded as follows:

1. **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.**
2. **10 marks**  
The marks given out of 40 for publishing the research paper should be divided into four course and should awarded out of 10 in each of the four course.

i. **Suggested format of Question paper of 30 marks for the written test.**

<b>Q1.</b>	<b>Attempt <u>any two</u> of the following:</b>	<b>16</b>
a.		
b.		
c.		
d.		
<b>Q2.</b>	<b>Attempt <u>any two</u> of the following:</b>	<b>14</b>
a.		
b.		
c.		
d.		

- ii. **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.**

## External Examination: (60 marks)

All questions are compulsory		
<b>Q1</b>	<b>(Based on Unit 1) Attempt <u>any two</u> of the following:</b>	<b>12</b>
a.		
b.		
c.		
d.		
<b>Q2</b>	<b>(Based on Unit 2) Attempt <u>any two</u> of the following:</b>	<b>12</b>
<b>Q3</b>	<b>(Based on Unit 3) Attempt <u>any two</u> of the following:</b>	<b>12</b>
<b>Q4</b>	<b>(Based on Unit 4) Attempt <u>any two</u> of the following:</b>	<b>12</b>
<b>Q5</b>	<b>(Based on Unit 5) Attempt <u>any two</u> of the following:</b>	<b>12</b>

## Practical Evaluation (50 marks)

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

<b>1.</b>	<b>Practical Question 1</b>	<b>20</b>
<b>2.</b>	<b>Practical Question 2</b>	<b>20</b>
<b>3.</b>	<b>Journal</b>	<b>5</b>
<b>4.</b>	<b>Viva Voce</b>	<b>5</b>

OR

<b>1.</b>	<b>Practical Question</b>	<b>40</b>
<b>2.</b>	<b>Journal</b>	<b>5</b>
<b>3.</b>	<b>Viva Voce</b>	<b>5</b>