

# University Of Mumbai



Syllabus for M.Sc. I.T. Part II  
Semester III and IV  
Programme: M.Sc.  
Subject: Information Technology  
**CHOICE BASED(REVISED)**  
with effect from the academic year  
2020 – 2021

Artificial Intelligence Track
Image Processing Track
Cloud Computing Track
Security Track

SEMESTER - III					
Course Title					
Course Code	Theory	Credits	Course Code	Practical	Credits
PSIT301	Technical Writing and Entrepreneurship Development	4	PSIT3P1	Project Documentation and Viva	2
Elective 1: Select Any one from the courses listed below along with corresponding practical course					
PSIT302a	Applied Artificial Intelligence	4	PSIT3P2a	Applied Artificial Intelligence Practical	2
PSIT302b	Computer Vision		PSIT3P2b	Computer Vision Practical	
PSIT302c	Cloud Application Development		PSIT3P2c	Cloud Application Development Practical	
PSIT302d	Security Breaches and Countermeasures		PSIT3P2d	Security Breaches and Countermeasures Practical	
Elective 2: Select Any one from the courses listed below along with corresponding practical course					
PSIT303a	Machine Learning	4	PSIT3P3a	Machine Learning Practical	2
PSIT303b	Biomedical Image Processing		PSIT3P3b	Biomedical Image Processing Practical	
PSIT303c	Cloud Management		PSIT3P3c	Cloud Management Practical	
PSIT303d	Malware Analysis		PSIT3P3d	Malware Analysis Practical	
Elective 3: Select Any one from the courses listed below along with corresponding practical course					
PSIT304a	Robotic Process Automation	4	PSIT3P4a	Robotic Process Automation Practical	2
PSIT304b	Virtual Reality and Augmented Reality		PSIT3P4b	Virtual Reality and Augmented Reality Practical	
PSIT304c	Data Center Technologies		PSIT3P4c	Data Center Technologies Practical	
PSIT304d	Offensive Security		PSIT3P4d	Offensive Security Practical	
	Total Theory Credits	<b>16</b>		Total Practical Credits	<b>8</b>
<b>Total Credits for Semester III: 24</b>					

SEMESTER - IV					
Course Title					
Course Code	Theory	Credits	Course Code	Practical	Credits
PSIT401	Blockchain	4	PSIT4P1		2
Elective 1: Select Any one from the courses listed below along with corresponding practical course					
PSIT402a	Natural Language Processing	4	PSIT4P2a	Natural Language Processing Practical	2
PSIT402b	Digital Image Forensics		PSIT4P2b	Digital Image Forensics Practical	
PSIT402c	Advanced IoT		PSIT4P2c	Advanced IoT Practical	
PSIT402d	Cyber Forensics		PSIT4P2d	Cyber Forensics Practical	
Elective 2: Select Any one from the courses listed below along with corresponding practical course					
PSIT403a	Deep Learning	4	PSIT4P3a	Deep Learning Practical	2
PSIT403b	Remote Sensing		PSIT4P3b	Remote Sensing Practical	
PSIT403c	Server Virtualization on VMWare Platform		PSIT4P3c	Server Virtualization on VMWare Platform Practical	
PSIT403d	Security Operations Center		PSIT4P3d	Security Operations Center Practical	
Elective 3: Select Any one from the courses listed below. Project Implementation and Viva is compulsory					
PSIT404a	Human Computer Interaction	4	PSIT4P4	Project Implementation and Viva	2
PSIT404b	Advanced Applications of Image Processing				
PSIT404c	Storage as a Service				
PSIT404d	Information Security Auditing				
	Total Theory Credits	<b>16</b>		Total Practical Credits	<b>8</b>
Total Credits for Semester IV: 24					

If a student selects all 6 papers of Artificial Intelligence Track, he should be awarded the degree **M.Sc. (Information Technology), Artificial Intelligence Specialisation.**

If a student selects all 6 papers of Image Processing Track, he should be awarded the degree **M.Sc. (Information Technology), Image Processing Specialisation.**

If a student selects all 6 papers of Cloud Computing Track, he should be awarded the degree **M.Sc. (Information Technology), Cloud Computing Specialisation**

If a student selects all 6 papers of Artificial Security Track, he should be awarded the degree **M.Sc. (Information Technology), Security Specialisation**

All other students will be awarded M.Sc. (Information Technology) degree.

# **SEMESTER IV**

<b>M. Sc (Information Technology)</b>		<b>Semester – IV</b>	
<b>Course Name: Cyber Forensics</b>		<b>Course Code: PSIT402d</b>	
<b>Periods per week (1 Period is 60 minutes)</b>		4	
<b>Credits</b>		4	
		<b>Hours</b>	<b>Marks</b>
<b>Evaluation System</b>	<b>Theory Examination</b>	2½	60
	<b>Internal</b>	--	40

### Course Objectives:

- Explain laws relevant to computer forensics
- Seize digital evidence from pc systems
- Recover data to be used as evidence
- Analyse data and reconstruct events
- Explain how data may be concealed or hidden

<b>Unit</b>	<b>Details</b>	<b>Lectures</b>	<b>Outcome</b>
<b>I</b>	Computer Forensics: The present Scenario, The Investigation Process, Computers – Searching and Seizing, Electronic Evidence, Procedures to be followed by the first responder.	<b>12</b>	<b>CO1</b>
<b>II</b>	Setting up a lab for Computer Forensics, Hard Disks and File Systems, Forensics on Windows Machine, Acquire and Duplicate Data	<b>12</b>	<b>CO2</b>
<b>III</b>	Recovery of deleted files and partitions, Using Access Data FTK and Encase for forensics Investigation, Forensic analysis of Steganography and Image files, Cracking Application passwords.	<b>12</b>	<b>CO3</b>
<b>IV</b>	Capturing logs and correlating to the events, Network Forensics – Investigating logs and Network traffic, Investigating Wireless and Web Attacks.	<b>12</b>	<b>CO4</b>
<b>V</b>	Email Tracking and Email Crime investigation. Mobile Forensics, Reports of Investigation, Become an expert witness.	<b>12</b>	<b>CO5</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.	EC-Council CHFIv10 Study Guide	--	EC-Council	--	2018
2.	The official CHFI Exam 312-49 study Guide	Dave Kleiman	SYNGRESS	--	2007
3.	Digital Forensics and Incident Response	Gerard Johansen	Packt Publishing	--	2020
4.	Practical Cyber Forensics	Niranjan Reddy	Apress	--	2019

## 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 (30 in Semester 4) 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 / Other 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)

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

