

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	16		Total Practical Credits	8
Total Credits for Semester III: 24					

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	16		Total Practical Credits	8
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

M. Sc (Information Technology)		Semester – IV	
Course Name: Information Security Auditing		Course Code: PSIT404d	
Periods per week (1 Period is 60 minutes)		4	
Credits		4	
		Hours	Marks
Evaluation System	Theory Examination	2½	60
	Internal	--	40

Course Objectives:

- Understand various information security policies in place.
- Assess an organization based on the needs and suggest the requisite information security policies to be deployed.
- Audit the organization across relevant policies and assist the organization in implementing such policies along with suggesting improvements.

Unit	Details	Lectures	Outcome
I	Secrets of a Successful Auditor Understanding the Demand for IS Audits Understanding Policies, Standards, Guidelines, and Procedures Understanding Professional Ethics Understanding the Purpose of an Audit Differentiating between Auditor and Auditee Roles Implementing Audit Standards Auditor Is an Executive Position Understanding the Corporate Organizational Structure Governance Strategy Planning for Organizational Control Overview of Tactical Management Planning and Performance Overview of Business Process Reengineering Operations Management Summary Audit Process Understanding the Audit Program Establishing and Approving an Audit Charter Preplanning Specific Audits Performing an Audit Risk Assessment Determining Whether an Audit Is Possible Performing the Audit Gathering Audit Evidence Conducting Audit Evidence Testing Generating Audit Findings Report Findings Conducting Follow-up (Closing Meeting)	12	CO1
II	Information Systems Acquisition and Development Project Governance and Management Business Case and Feasibility Analysis System Development Methodologies Control Identification and Design Testing Methodologies Configuration and Release Management	12	CO2

	System Migration, Infrastructure Deployment and Data Conversion Post-implementation Review		
III	Information Systems Operations Introduction Common Technology Components IT Asset Management Job Scheduling and Production Process Automation System Interfaces End-user Computing Data Governance Systems Performance Management Problem and Incident Management Change, Configuration, Release and IT Service Level Management Database Management Business Resilience Business Impact Analysis Data Backup, Storage and Restoration Business Continuity Plan Disaster Recovery Plans	12	CO3
IV	Information Systems Life Cycle Governance in Software Development Management of Software Quality Overview of the Executive Steering Committee Change Management Management of the Software Project Overview of the System Development Life Cycle Overview of Data Architecture Decision Support Systems Program Architecture Centralization vs. Decentralization Electronic Commerce System Implementation and Operations Understanding the Nature of IT Services Performing IT Operations Management Performing Capacity Management Using Administrative Protection Performing Problem Management Monitoring the Status of Controls Implementing Physical Protection	12	CO4
V	Protecting Information Assets Understanding the Threat Using Technical Protection Business Continuity and Disaster Recovery Debunking the Myths Understanding the Five Conflicting Disciplines Called Business Continuity Defining Disaster Recovery Defining the Purpose of Business Continuity Uniting Other Plans with Business Continuity Understanding the Five Phases of a Business Continuity Program Understanding the Auditor Interests in BC/DR Plans	12	CO5

Books and References:					
Sr. No.	Title	Author/s	Publisher	Edition	Year
1.	CISA®: Certified Information Systems Auditor	David Cannon	SYBEX	Fourth Edition	2016
2.	CISA Review Manual 27th Edition		ISACA		2019
3.	CISA Certified Information Systems Auditor All-in-One Exam Guide, Fourth Edition,		O'Reilly	4th Edition	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.**

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

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

