

Sem	Part	Course	Course Title	Credits	Marks			Hrs/ Week	Exam Duration
					CAM	TEE	Total		
V	III	Core	Python Programming	4	25	75	100	3	Theory TEE : 3Hrs, Practicals TEE :3Hrs
	III	Core	Computer Networks	4	25	75	100	4	
	III	Core	Operating Systems	4	25	75	100	4	
	III	Core	Principles of Software Engineering	4	25	75	100	4	
	III	Core	Quantum Computing	4	25	75	100	4	
	III	Elective	Elective -I	4	25	75	100	4	
	III	Core	Python Programming Lab	3	40	60	100	4	
	IV	Skill Based Subject	Skill Based Subject - Aptitude *	2	25	75	100	3	
VI	III	Core	Cyber Security	4	25	75	100	4	
	III	Core	Mobile Application Development	3	25	75	100	4	
	III	Elective	Elective-II	4	25	75	100	4	
	III	Core	Mobile Application Development Lab	3	40	60	100	4	
	III	Core	Project and Viva Voce	7	25	75	100	12	
	IV	Skill Based Subject	Skill Based Subject - Soft Skills *	2	25	75	100	2	
TOTAL				52	1195	3105	1400	60	

* Both CAM and TEE marks will be evaluated internally.

NA-Not Applicable, Basic Tamil/Advanced Tamil - CAM only,

Elective-I

- 1 Data Warehousing And Mining
- 2 Cloud Computing
- 3 Geographic Information Systems
- 4 Artificial Intelligence
- 5 Distributed Computing
- 6 Embedded System and its Applications
- 7 Software Testing
- 8 Web Programming

Elective-II

- 1 Soft Computing
- 2 Wireless Application Protocol
- 3 Software Project Management
- 4 LINUX Operating System
- 5 Integrating SOA and Web Services
- 6 Information Security
- 7 Enterprise Resource Planning
- 8 Air And Sea Navigation

Project & Viva Voce Split up	
CA (25 marks)	
Review I	10 Marks
Review II	15 Marks
TEE (75 Marks)	
Viva	50 Marks
Documentation	25 Marks

G. R. Damodaran

BVI-02
2018-19

Dr G R DAMODARAN COLLEGE OF SCIENCE (Autonomous), COIMBATORE
Department of Computer Science
B Sc (Information Technology)
Effective from the academic year: 2018 – 2019
FIFTH SEMESTER

Core: QUANTUM COMPUTING

Objective of the subject: The objective of this course is to provide an introduction to quantum computation. Mathematical models of quantum computation, their relationships to each other, and to physical systems. Prerequisite knowledge on Discrete Structures, Computer Architecture and Linear Algebra is needed.

UNIT I: FUNDAMENTALS OF QUANTUMNESS (10 hrs)

Evolution of Quantum Computing-Global perspectives – History – Future directions – Quantum bits – Multiple Qubits– Quantum Computation – Single Qubit Gates – Multiple Qubit Gates – Measurements in Bases other than Computational Basis - Quantum Circuits – Qubit Copying Circuits – Examples: Bell states, quantum teleportation – Cost effectiveness compared to Digital Electronics – longevity of the technology.

UNIT II: COMPUTATIONAL SCIENCES (10 hrs)

Models for Computation – Turing Machine – Analysis of Computational Problems – Quantifying Computational Resources – Computational Complexity - Perspectives of Computer Science – level of perfection compared to Digital Electronics – Rapidity – Storage Capacity – life of the data – security of the data - features

UNIT III: QUANTUM COMPUTATION (10 hrs)

Quantum Algorithms - Single Qubit Operations - Controlled Operations –Measurements - Universal Quantum Gates - Two Level Unitary Gates - Single Qubit and CNOT Gate – proneness to hacking

UNIT IV: QUANTUM ALGORITHMS (10 hrs)

Probabilistic versus Quantum Algorithms – Phase Kick-Back – The Deutsch Algorithm – The Deutsch-Jozsa Algorithm – Simon's Algorithm.

UNIT V: CASE STUDY (10 hrs)

Quantum Qubit Simulator- CAD for Quantum Computer Simulator –QUACK (Quantum Computer Simulator for MATLAB) -Open Source Tool for Quantum Computing

REFERENCEBOOKS:

1. Michael A. Nielsen and Issac L. Chuang, Quantum Computation and Quantum Information, Cambridge University Press, 2012
2. P. Kaye, R. Laflamme, and M. Mosca, An introduction to Quantum Computing, Oxford University Press, 2007.
3. V. Sahn, Quantum Computing, Tata McGraw-Hill Publishing Company, 2007.
4. Eleanor Rieffel and Wolf Gang Polak, Quantum Computing: A Gentle Introduction, MIT Press, 2011.
5. Mermin N.D, Quantum Computer Science: An Introduction, Cambridge University Press 2007

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