NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF COMPUTER APPLICATIONS

COURSE PLAN – PART I			
Name of the programme and specialization	M.Tech. DATA ANALYTICS		
Course Title	DISTRIBUTED AND CLOUD COMPUTING		
Course Code	CA610	No. of Credits	3
Course Code of Pre-requisite subject(s)			
Session	January 2023	Section (if, applicable)	-
Name of Faculty	G.R.Gangadharan	Department	Computer Applications
Official Email	ganga@nitt.edu	Telephone No.	0431-2503737
Name of Course Coordinator(s) (if, applicable)	Dr. Balaji Banothu		
Official E-mail	balaji@nitt.edu	Telephone No.	-
Course Type (please tick appropriately)	Core course		

Syllabus (approved in BoS)

Fundamentals of Distributed Computing – Inter Process Communications – Distributed Computing Paradigms - Distributed Objects

Fundamentals of Parallel Computing – Classification of Parallel Computers – Parallel Computer Architectures – Performance Analysis of Parallel Computing – Parallel Computational Model – Introduction to Parallel Algorithms – OpenMP and CUDA

Introduction to virtualization – Different Approaches to Virtualization – Server – Storage – Network Virtualization – VM Migration – Hypervisors – Case Studies: VMware – KVM – Xen –Containerization

Cloud Computing Properties and Characteristics – Business Drivers for Adopting Cloud Computing – Cloud Computing Architecture – Cloud Computing Service Delivery Models: Infrastructure as a Service (IaaS) – Platform as a Service (PaaS) – Software as a Service(SaaS) Deployment Models: Public cloud – Private cloud – Hybrid cloud – Data Center Design and Management – Case Studies: Amazon AWS – Microsoft Azure – Amazon EC2 – Google Cloud

Service Level Agreements (SLAs) – Pricing Models of Cloud – Migrating to Cloud – Cloud Simulators – Cloud Security Risks – Emerging Trends in Cloud Computing

REFERENCES:

1. Kai Hwang, Jack Dongarra, Geoffrey C. Fox, "Distributed and Cloud Computing: From Parallel Processing to the Internet of Things", Morgan Kaufmann, 2013
2. Rajkumar Buyya, Christian Vecchiola, and Thamarai Selvi, "Mastering Cloud Computing", McGraw Hill, 2017.
3. Ajit Singh, "Parallel and Distributed Computing", Kindle Version, e-Book, 2021.
4. Bertil S, Jorge G-D, Christian H and Mortiz S, "Parallel Programming: Concepts and Practice", Morgan Kaufmann, 2018.
5. Sunita Mahajan and Seema Shah, "Distributed Computing", 2nd Edition, Oxford Press, 2013.

COURSE OBJECTIVES

• To explore basic concepts and practices of distributed computing.

• To understand cloud computing concepts, technologies, architecture and applications.

• To understand different cloud programming platforms and tools to develop and deploy applications on cloud.

MAPPING OF COs with POs

Course Outcomes	Programme Outcomes (PO) (Enter Numbers only)
1. Acquire knowledge of the concepts and technologies of distributed and cloud computing.	I,II,III,V
2. Demonstrate where to apply parallel and distributed techniques.	I,II,III,IV
3. Use various performance criteria to evaluate the quality of the cloud architecture.	I,II,III,V

COURSE PLAN – PART II

COURSE OVERVIEW

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	Week 1 (3 Classes)	Fundamentals of Distributed Computing – Inter Process Communications	PPT
2	Week 2 (3 Classes)	Distributed Computing Paradigms	PPT
3	Week 3 (3 Classes)	Distributed Objects	PPT
4	Week 4 (3 Classes)	Fundamentals of Parallel Computing – Classification of Parallel Computers	PPT
5	Week 5 (3 Classes)	Parallel Computer Architectures – Performance Analysis of Parallel Computing – Parallel Computational Model	PPT
6	Week 6 (3 Classes)	Introduction to Parallel Algorithms – OpenMP and CUDA.	PPT
7	Week 7 (3 Classes)	Introduction to virtualization – Different Approaches to Virtualization – Server – Storage – Network Virtualization – VM Migration	PPT
8	Week 8 (3 Classes)	Hypervisors – Case Studies: VMware – KVM – Xen –Containerization	PPT

9	Week 9 (3 Classes)	Cloud Computing Properties and Characteristics – Business Drivers for Adopting Cloud Computing – Cloud Computing Architecture	PPT
10	Week 10 (3 Classes)	Cloud Computing Service Delivery Models: Infrastructure as a Service (IaaS) – Platform as a Service (PaaS) – Software as a Service(SaaS) Deployment Models: Public cloud – Private cloud – Hybrid cloud	PPT
11	Week 11 (3 Classes)	Data Center Design and Management – Case Studies: Amazon AWS – Microsoft Azure – Amazon EC2 – Google Cloud	PPT
12	Week 12 (3 Classes)	Service Level Agreements (SLAs) – Pricing Models of Cloud	PPT
13	Week 13 (3 Classes)	Migrating to Cloud – Cloud Simulators – Cloud Security Risks	PPT
14	Week 14 (1 Class)	Emerging Trends in Cloud Computing	PPT

COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Cycle Test 1	As per academic calendar	60 Minutes	20
2	Cycle Test 2	As per academic calendar	60 Minutes	20
3	Seminar and Assignment	9th week	-	10
CPA	Compensation Assessment*	As per academic calendar	60 Minutes	20
4	Final Assessment *	As per academic calendar	180 Minutes	50

*mandatory; refer to guidelines on page 5

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

- The students through the class representative may give their feedback at any time to the course coordinator which will be duly addressed.
- The students may give their feedback during class committee meetings.

COURSE POLICY (including compensation assessment to be specified)

MODE OF CORRESPONDENCE

By Email: ganga@nitt.edu

COMPENSATION ASSESSMENT POLICY

Compensation assessment will be conducted for absentees in cycle test I or cycle test II only after the submission of medical or On-Duty certificates signed by competent authority.

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- At least 75% attendance in each course is mandatory.

- A maximum of 10% shall be allowed under On Duty (OD) category.

- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

ACADEMIC DISHONESTY & PLAGIARISM

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.

- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.

- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.

- The above policy against academic dishonesty shall be applicable for all the programmes.

ADDITIONAL INFORMATION, IF ANY

FOR APPROVAL

Course Faculty _____ CC- Chairperson _____ HOD _____ 6/2/23

Head of the Department
Dept.of Computer Applications
National Institute of Technology
Tiruchirappalli - 620 015.
Tamilnadu, India.

Guidelines

a) The number of assessments for any theory course shall range from 4 to 6.

b) Every theory course shall have a final assessment on the entire syllabus with at least 30% weightage.

c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered.

d) The passing minimum shall be as per the regulations.

B.Tech. Admitted in				P.G.
2018	**2017**	**2016**	**2015**	
35% or (Class average/2) whichever is greater.		(Peak/3) or (Class Average/2) whichever is lower		40%

e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.

f) Absolute grading policy shall be incorporated if the number of students per course is less than 10.

g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.