NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF COMPUTER APPLICATIONS

COURSE PLAN – PART I			
Name of the programme and specialization	MASTER OF COMPUTER APLICATIONS		
Course Title	DISTRIBUTED TECHNOLOGIES		
Course Code	**CA726**	**No. of Credits**	**3**
Course Code of Pre-requisite subject(s)	CA727,CA712,CA714		
Session	~~**July**~~ **/ January 2019**	**Section (if, applicable)**	**B**
Name of Faculty	**Mrs.A.Cynthia devi**	**Department**	**COMPUTER APPLICATIONS**
Official Email	**cynthia@nitt.edu**	**Telephone No.**	**-**
Name of Course Coordinator(s) (if, applicable)	**Dr.P.J.A.Alphonse**		
Official E-mail	**alphonse@nitt.edu**	**Telephone No.**	**0431 - 2503742**
Course Type (please tick appropriately**)**	☐ ✓ **Core course**		

Syllabus (approved in BoS)

Introduction- Different Forms of Computing- Architecture - Inter-process Communications :IPC Program Interface-Event Synchronization-Timeouts and Threading Deadlocks and Timeouts- Data Representation- Data Encoding- Text-Based Protocols Request-Response Protocols-Event Diagram - Sequence Diagram- Connection-Oriented Vs Connectionless IPC

Client Server: Architecture – Types of Servers – Connection Oriented-Connectionless, Iterative-Concurrent and Stateful Servers. Distributed Computing: Paradigm – Architecture– Application

Socket API and Group Communication: Background-The Socket Metaphor in IPC-The Datagram Socket API-The Stream-Mode- Socket API- Sockets With Non-blocking I/O Operations- Secure Socket API. Group Communication – Unicasting- Multicasting and its types – Java Basic Multicast API - Reliable Multicast API

Distributed Objects : Message Passing Vs Distributed Objects- An Archetypal Distributed Object Architecture- Distributed Object Systems-Remote Procedure Calls- Remote Method Invocation: RMI Architecture, API for Java RMI, Sample RMI Application- Building an RMI Application-Testing and Debugging-Comparison of RMI And Socket APIs

CORBA, COM and Web Services: CORBA Object Interface- Inter-ORB Protocols- Object Servers- Object Clients- CORBA Object References - CORBA Naming Service –Interoperable Naming Service- CORBA Object Services- Object Adapters- Java IDL.WebServices: SOAP UDDI-WSDL-XML-RESTFUL WEB SERVICE
COURSE OBJECTIVES
To learn the various distributed objects and technologies.
MAPPING OF COs with POs

Course Outcomes	**Programme Outcomes (PO)** (Enter Numbers only)
1. Explain the principles and issues in Inter Process Communication	**1,2,3,6**
2. Use the concepts of client/server in developing applications	**3,5**
3. Implement IPC applications using sockets	**5**
4. Practice the distributed object technologies and use them in developing applications	**5,12**

COURSE PLAN – PART II

COURSE OVERVIEW

The major themes this course will teach include process distribution and communication, data distribution, scheduling, concurrency, resource sharing, synchronization, naming, abstraction and modularity, failure handling, protection from accidental and malicious harm, distributed programming models, distributed file systems, virtualization, and the use of instrumentation, monitoring and debugging tools in problem solving. Students will learn the design and implementation of today's popular web services and its nuances in distributed systems.

COURSE TEACHING AND LEARNING ACTIVITIES **(** Add more rows)

S.No.	**Week/Contact Hours**	**Topic**	**Mode of Delivery**
1	1	Computing and computing environment.	Chalk and Talk
	2	Distributed systems an overview	
	3	Architectural styles	
2	1	Java programming basics	PPT
	2	Java network and multithreading	
	3	Java applets ,AWT and Swing	
3	1	IPC	Chalk and Talk
	2	IPC API	
	3	Event Synchronization with example	
4	1	Deadlocks ,Timeouts and Threads	Chalk and Talk
	2	Data representation with encoding schemes	
	3	Protocols in IPC , event and sequence diagram	

5	1	Connection oriented and connectionless data transfer , client server architecture	Chalk and Talk
	2	Servers and its types	
	3	Servers and its types	
6	1	Distributed computing paradigms – architecture and applications	Chalk and Talk
	2	Sockets and socket API	
	3	Group Communication	
7	1	The Socket metaphor in IPC	Chalk and Talk
	2	Datagram socket – the Stream mode	
	3	Sockets with non block I/O	
8	1	Secure socket interface	Chalk and Talk
	2	Unicast and multicasting and its types	
	3	Java basic multicast - example	
9	1	Reliable multicast with examples	Chalk and Talk
	2	Message passing Vs Distributed Objects	
	3	An Archetypal distributed object architrecture	
10	1	Distributed object systems	Chalk and Talk
	2	RPC - Examples	
	3	RMI – Architecture with example	
11	1	RMI Application with example - JAVA	Chalk and Talk
	2	Testing and debugging RMI – Comparision with sockets API	
	3	Web Services - essentials	
12	1	CORBA	PPT
	2	JAVA IDL - SOAP	
	3	UDDI,XML,WSDL, RESTFUL webservices	

COURSE ASSESSMENT METHODS (shall range from 4 to 6**)**

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Test 1	4th week	60 mins	20
2	Test 2	8th week	60 mins	20
3	Assignment	Before 8th week		20
CPA	Compensation Assessment*	At the end of course	60 mins	20
4	Final Assessment *	At the end of course	180 mins	40

***mandatory; refer to guidelines on page 4**

1. M. L. Liu, "Distributed Computing Principles and Applications", Pearson Education 2004
2. Mark Hansen, "SOA using JAVA Web Services", Prentice Hall 2007
3. Crichlow, "Distributed Systems: Computing over Networks", PHI 2009
4. Tanenbaum, Sten, "Distributed Systems - Principles and Paradigms", PHI 2006
5. Puder, "Distributed Systems Architecture - A Middleware Approach", Science & Technology Books 2005.
6. Lynch, "Distributed Algorithms" Science & Technology Books 1996.
7. David Reilly & Michael Reilly, "Java Networking and Distributed Computing", Addison Wesley,2002.
8. Jim Farley, "Java Distributed Computing", O'Reilly Media; 1st edition, 1998.

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

- The students may give their feedback during class committee meeting.
- Feedback from the students will be duly addressed in subsequent class.
- CO s will be computed for assessments.

COURSE POLICY (including compensation assessment to be specified**)**

Plagiarism: The students are expected to come with original algorithm design and code for problems given during class work , home work , team project, lab exercises and test assigned
Mode of Correspondence : Email
Compensation assessment : One compensation assessment will be given for students absent for both the cycle test 1 and 2 for genuine reasons.

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,

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

Students can get their doubts clarified at any time with the faculty members

FOR APPROVAL

Course Faculty _____ **CC- Chairperson** _____ **HOD** _____

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.