



Department of Computer Applications National Institute of Technology, Tiruchirappalli

1.Course Outline			
Course Title	Distributed Technology		
Course Code	CA726		
Department	CA	No. of Credits	3
Pre-requisites Course Code	CA727,CA712,CA714	Faculty Name	1. Dr. R. Siva Shankar 2. Dr. S. Suresh
PAC Chairman	Dr. R. Eswari		
E-mail	sivashankar@nitt.edu sureshs@nitt.edu	Telephone No.	+91-431-2503730
Course Type	Core Course		

2. Course Overview

This course deals with the major recent developments in distributed systems technology. It explains the principles of distributed systems such as communication, naming, synchronization, replication, fault tolerance and security. It covers architectures in distributed systems, reflecting the progress that has been made on organizing distributed systems, Explores the various distributed computing paradigms such as message passing, distributed objects, object spaces and web services. Examples of distributed services & distributed computing environments. Design and implementation of distributed applications. Design principles of context-aware pervasive systems.

3. Course Objectives

- To learn the various paradigms and technologies of distributed computing.

4. Course Outcomes (CO)

Student will be able to:

- Explain the principles and issues in Inter Process Communication.
- Use the concepts of client/server in developing applications.
- Implement IPC applications using sockets.
- Practice the distributed object technologies and use them in developing applications.

5. Course Outcome (CO)	Aligned Programme Outcome (PO)											
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
Explain the principles and issues in Inter Process Communication.	H	L	M									
Use the concepts of client/server in developing applications.	L	M	H		M							
Implement IPC applications using sockets.	M	L	H		M							
Practice the distributed object technologies and use them in developing applications.	M	L	M	L	H							

L-Low M-Medium H-High

6. Course Teaching and Learning Activities			
Week	No. of Classes	Topic Covered	Mode of Delivery
1	Class-I	Introduction- Different forms of Computing – Architectures	Chalk and Talk , Power Point Presentation
	Class-II	Inter Process Communication	Chalk and Talk
	Class-III	Synchronization	Chalk and Talk
2	Class-I	Data Representation and Data Encoding	Chalk and Talk , Power Point Presentation
	Class-II	Text-Based Protocols – Request-Response Protocols	Chalk and Talk , Power Point Presentation
	Class-III	Event Diagrams – Sequence Diagrams	Chalk and Talk
3	Class-I	Connection-Oriented and Connectionless IPC	Chalk and Talk
	Class-II	Client Server - Architecture	Chalk and Talk , Power Point Presentation
	Class-III	Types of Servers – Connection Oriented – Connectionless	Chalk and Talk , Power Point Presentation
4	Class-I	Iterative-Concurrent and Stateful Servers	Chalk and Talk , Power Point Presentation
	Class-II	Distributed Computing – Paradigms	Chalk and Talk , Power Point Presentation
	Class-III	Distributed Computing – Architectures - Application	Chalk and Talk , Power Point Presentation
5	Class-I	Socket Programming	Chalk and Talk , Power Point Presentation
	Class-II	The Datagram Socket API	Chalk and Talk , Power Point Presentation
	Class-III	The Stream-mode-socket API	Chalk and Talk , Power Point Presentation
	Class-I	Sockets with non-blocking I/O operations, Secure Sockets	Chalk and Talk , Power Point Presentation

6	Class-II	Group Communication – Unicasting and Multicasting	Chalk and Talk , Power Point Presentation
	Class-III	Java Basic Multicast API – reliable Multicast API	Chalk and Talk , Power Point Presentation
7	Class-I	Distributed Objects: Message passing Vs Distributed Objects	Chalk and Talk , Power Point Presentation
	Class-II	Archetypal distributed object architecture	Chalk and Talk
	Class-III	Distributed Object Systems	Chalk and Talk
8	Class-I	Remote Procedure Calls	Chalk and Talk , Power Point Presentation
	Class-II	RMI – Architecture	Chalk and Talk , Power Point Presentation
	Class-III	API for Java RMI	Chalk and Talk , Power Point Presentation
9	Class-I	Sample RMI Application	Chalk and Talk , Power Point Presentation
	Class-II	Building an RMI Application – Testing and Debugging	Chalk and Talk , Power Point Presentation
	Class-III	Comparison of RMI and Socket APIs	Chalk and Talk , Power Point Presentation
10	Class-I	CORBA Object Interface	Chalk and Talk , Power Point Presentation
	Class-II	Inter-ORB Protocols	Chalk and Talk , Power Point Presentation
	Class-III	Object Servers – Object Clients	Chalk and Talk , Power Point Presentation
11	Class-I	CORBA Object References	Chalk and Talk , Power Point Presentation
	Class-II	CORBA Naming and Object Services	Chalk and Talk , Power Point Presentation
	Class-III	Object Adapters – Java IDL	Chalk and Talk , Power Point Presentation
12	Class-I	Web Services – SOAP – UDDI - WSDL	Chalk and Talk , Power Point Presentation
	Class-II	XML – RESTFUL Web Service	Chalk and Talk , Power Point Presentation

7. Course Assessment Methods – Theory				
Sl. No.	Mode of Assessment	Week/Date	Duration	Weightage (%)
1.	Cycle Test –1	4 th week	60 mins	20
2.	Cycle Test –2	8 th week	60 mins	20
3.	Assignment/Seminar	7 th to 10 th week	-	10
4.	End Semester Exam	-	180 mins	50
Total				100

8. Essential Readings (Textbooks, Reference books, Websites, Journals, etc.)

REFERENCES:

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 & TechnologyBooks 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.

9. Course Exit Survey (mention the ways by which the feedback about the course is assessed and indicate the attainment level)

1. The students through the class rep may give their feedback at any time to the course co-ordinator which will be duly addressed.
2. The students may also give their feedback during Class Committee meeting.
3. 'Course Outcome Survey' form will be distributed on the last working day to all the students and the feedback on various rubrics will be analyzed.
4. The COs will be computed after arriving at the final marks.


10. Course Policy (including plagiarism, academic honesty, attendance, etc.)

- **Plagiarism**
The students are expected to come out with their original code for problems given assignments during the class work, and tests/examinations. If found to copy from internet/other students, zero marks will be assigned and action will be taken.
- **Attendance**
100% is a must. However, relaxation will be given for leave on emergency requirements (medical, death, etc.) and representing institute events. Minimum 75% is required.
- **Academic Honesty**
 - i. Possession of any electronic device, if any, found during the test or exam, the student will be debarred for 3 years from appearing for the exam and this will be printed in the Grade statement/Transcript.
 - ii. Tampering of MIS records, if any, found, then the results of the student will be with held and the student will not be allowed to appear for the Placement interviews conducted by the Office of Training & Placement, besides (i).

11. Additional Course Information

- The students can get their doubts clarified at any time with their faculty member with prior appointment.

For Senate's Consideration


1. Dr. R. Siva Shankar 2. Dr. S. Suresh Dr.R. Eswari Dr. S.R. Balasundaram
Course Faculty Class Committee Chairperson HOD/CA/NITT