# **PONDICHERRY ENGINEERING COLLEGE, PUDUCHERRY – 605 014**

## CURRICULUM AND SYLLABI FOR AUTONOMOUS STREAM

## **M.TECH. (DISTRIBUTED SYSTEMS) COURSES**

## (FOR STUDENTS ADMITTED FROM ACADEMIC YEAR 2015-16 ONWARDS)

## **CURRICULUM**

#### **I SEMESTER**

Subject	Subjects	Catagory		Periods	5		Marks	S	Credits
Code	Subjects	Category	L	Т	Р	СА	SE	тм	Credits
CS151	Design of Distributed Systems	ΤY	3	1	-	40	60	100	4
CS152	High Performance Networks	ΤY	3	1	-	40	60	100	4
CS153	Distributed Database Management Systems	ΤY	3	1	-	40	60	100	4
CS154	Parallel Computing	ΤY	3	1	-	40	60	100	4
	Elective-I	ΤY	-	-	-	40	60	100	4
	Elective-II	ΤY	-	-	-	40	60	100	4
CS155	Advanced Software Laboratory-I	LB	-	-	3	60	40	100	2
	Т	otal Credits							26

#### **II SEMESTER**

Subject	Subjects	Catagory		Periods	;		Marks	;	Credits
Code	Subjects	Category	L	Т	Р	СА	SE	ТМ	Creats
CS156	Cloud Computing	ΤY	3	1	-	40	60	100	4
CS157	Service Oriented Architecture and Web Services	тсм	3	-	2	50	50	100	4
	Elective-III	ΤY	-	-	-	40	60	100	4
	Elective-IV	ΤY	-	-	-	40	60	100	4
	Elective-V	ΤY	-	-	-	40	60	100	4
	Elective-VI	ΤY	-	-	-	40	60	100	4
CS158	Advance Software Laboratory-II	LB	-	-	3	60	40	100	2
CS159	Research Methodology	PR	-	-	3	100	-	100	1
	Total Credits								

#### SEMESTER-III

Subject Code	Subjects	Cotogomy		Periods			Credits		
Subject Code	Subjects	Category	L	т	Р	СА	SE	тм	Credits
CS160	Project Phase I	PR	-	-	-	150	150	300	9
		Total Credits							9

#### **SEMESTER-IV**

Subject Code	Subjects	Category		Periods	5		Marks		Credits
		category	L	т	Ρ	СА	SE	тм	
CS161	Project Phase II	PR	-	-	-	200	200	400	14
	Professional Development Courses	PR	-	-	-	200	-	200	2
Total Credits								16	

A representative list of *Professional Development Courses* is given below:

- a) Industrial Training (Limited to one credit)
- b) Specific Field Knowledge Training
- c) Seminar related with directed study
- d) Paper Publication in SCI Journals(*Limited to one credit*)

#CA - Continuous Assessment, SE - Semester Examination, TM - Total Marks \*TY -Theory, TCM - Theory with a Mini Project, LB – Laboratory, PR - Practice

### LIST OF ELECTIVES

SI.No.	Subject Code	Subjects	Category
1.	CSE51	Mobile Computing Systems	TY
2.	CSE52	Information Retrieval Techniques	TY
3.	CSE53	Advanced Distributed System Architectures	TY
4.	CSE54	Machine Learning	TY
5.	CSE55	Agent Technology	TY
6.	CSE56	Optical Communication Networks	TY
7.	CSE57	Software Architecture	TY
8.	CSE58	Distributed Algorithms	ΤY
9.	CSE59	Data Mining and Warehousing Techniques	TY
10.	CSE60	Multi core Programming	ΤY
11.	CSE61	Ad hoc and Sensor Networks	TY
12.	CSE62	Network Management Systems	ΤY
13.	CSE63	Search Engine Optimization	ΤY
14.	CSE64	Text Data Mining	TY
15.	CSE65	Social Network Analytics	TY
16.	CSE66	Geographical Information System	TY
17.	CSE67	Internals of Operating System	TY
18.	CSE68	Distributed System Security	TY
19.	CSE69	Ethical Hacking	TY
20.	CSE70	Embedded Systems	TY

**SYLLABUS (Core Subjects)** 

Objectives• To Learn th • Design Mid • Design of FOutcomeOn successful • Create a Di Web servic • Design of FUNIT - IDistributed System • Communication - Distributed File system • Architecture - Algorithm - Protocols • Architecture - Algorithm - Protocols • Architecture - Algorithm - Protocols • Commit Protocols - Failure Resilient proce UNIT - VNaming, Securi Introduction - Features of Good Mechanisms - Issues in Designin Distributed Systems - Introductio Introduction to Real Time Oper	ce the Architecture, a ne Fundamental Princip ne Design of Distributed ompletion of the course deleware Components f istributed System throu- ces fault Tolerant Distributed tems Architecture, Typ buted Systems – Reso els – Functional Model ojects and Remote Invo nd Notifications ferating Systems faction Primitives – Inho Cuts; Termination Deten n - Token-Based Algorit Centralized Deadlock – Classification - Solution source Management tems – Architecture – I	L 3 and types oles of Dis d Fault To e, student for Distrib ugh the in ed System bes and R ource Shar burce Shar s - Charac ocation – herent Lim ection. Dis thms – Su -Detection ons –App	ris / Wo T 1 and de tribute lerant tribute swill k buted S tegrati ns emote ring an cteriza Comm nitation stribut uzuki-K n Algo lication ms – D	P - esign iss ed Oper Systems be able Systems ion of H e Procec nd the V tion of municat municat casami's prithms ns.	ating Syste s to: eterogene lure Call Web –Cha Distribute ion Betwe mport's Lo tual Exclu s Broadcas - Distribu	CA 40 tributed Systems cous Applica cous Applica llenges- Systems - en Distribu gical Clock; sion – Nor t Algorithm uted Dead	Hou stem Mo - Client- uted Obj Hou : Vector n-Token n – Distr lock-Det Hou nared Mo	TM 100 100 ars: 09 odels - Server ects – urs: 09 Clock; Based ibuted ection urs: 09 emory
CS151Design of DistributedPrerequisite-Objectives• To introduceObjectives• To Learn theOutcome• To Learn theOutcome• Design MideOutcome• Design of FUNIT – IDistributed SystemIntroduction – Examples of DistriIntroduction – Architectural ModeCommunication – Distributed ObRemote Procedure Call – Events andUNIT – IIDistributed OpIntroduction – Issues – CommuniCausal Ordering; Global State; CAlgorithms – Lamport's AlgorithmDeadlock Detection – Issues –Algorithms. Agreement ProtocolsUNIT – IIIDistributed ResIntroduction - Distributed File systemAlgorithms – Lamport's AlgorithmDeadlock Detection – Issues –Algorithms – Lamport's AlgorithmDeadlock Detection – Issues –Introduction - Distributed File system- Architecture – Algorithm – ProtocolsUNIT – IVFailure RecoveryRecovery in Concurrent Systems –Introduction – Commit ProtocolsProtocols – Failure Resilient proceUNIT – VNaming, SecuriIntroduction – Features of GoodMechanisms – Issues in DesigninDistributed Systems – IntroductioIntroduction to Real Time Oper	ce the Architecture, a ne Fundamental Princip ne Design of Distributed ompletion of the course deleware Components f istributed System throu- ces fault Tolerant Distributed tems Architecture, Typ buted Systems – Reso els – Functional Model ojects and Remote Invo nd Notifications ferating Systems faction Primitives – Inho Cuts; Termination Deten n - Token-Based Algorit Centralized Deadlock – Classification - Solution source Management tems – Architecture – I	L 3 and types oles of Dis d Fault To e, student for Distrib ugh the in ed System bes and R ource Shar burce Shar s - Charac ocation – herent Lim ection. Dis thms – Su -Detection ons –App	T 1 and de tribute lerant ts will b buted S tegrati ts tegrati ns emote ring an cteriza Comm nitation stribut uzuki-K n Algo lication ms – D	P - esign iss ed Oper Systems be able Systems ion of H e Procec nd the V tion of municat municat casami's prithms ns.	C 4 ues of Dist ating Syste s to: eterogene lure Call Neb –Cha Distribute ion Betwe nport's Lo tual Exclus s Broadcas - Distribute	CA 40 tributed Systems cous Applica cous Applica llenges- Systems - en Distribu gical Clock; sion – Nor t Algorithm uted Dead	SE 60 stems stems ations ar Hou stem Mo - Client- uted Obj Hou - Client- uted Obj Uck-Det hor lock-Det Hou hared Mo	TM 100 100 ars: 09 odels - Server ects – urs: 09 Clock; Based ibuted ection urs: 09 emory
PrerequisiteObjectives• To introduceObjectives• To Learn the• To Learn the• To Learn the• To Learn the• On successful construction• Design Mide• Create a Ding• Design of F• Design of FUNIT – IDistributed SystimationIntroduction – Examples of DistriIntroduction – Architectural ModeCommunication – Distributed ObRemote Procedure Call – Events andUNIT – IIDistributed OpIntroduction – Issues – CommuniCausal Ordering; Global State; CAlgorithms – Lamport's AlgorithmDeadlock Detection – Issues –Algorithms. Agreement ProtocolsUNIT – IIIDistributed ResIntroduction - Distributed File systing– Architecture – Algorithm – ProtocolsVITT – IVFailure RecoveringRecovery – Introduction – basic ofRecovery in Concurrent Systems –Introduction – Commit ProtocolsProtocols – Failure Resilient proceUNIT – VNaming, SecuriIntroduction – Features of GoodMechanisms – Issues in DesigninDistributed Systems – IntroductioIntroduction to Real Time Oper	ce the Architecture, a ne Fundamental Princip ne Design of Distributed ompletion of the course deleware Components f istributed System throu- ces fault Tolerant Distributed tems Architecture, Typ buted Systems – Reso els – Functional Model ojects and Remote Invo nd Notifications ferating Systems faction Primitives – Inho Cuts; Termination Deten n - Token-Based Algorit Centralized Deadlock – Classification - Solution source Management tems – Architecture – I	3 Ind types a oles of Dis d Fault To e, student for Distributed ource Shar ocation – herent Lime ction. Dis thms – Su -Detection ons – App Mechanis	1 and de tribute lerant is s will b buted S tegrati ns emote ring an cteriza comm nitation stribut uzuki-K n Algo lication ms – D	esign iss ed Oper System be able Systems ion of H e Procect nd the V tion of municat municat ns - Lar ced Mu (asami's prithms ns.	4 ues of Dist ating Syste s to: eterogene lure Call Web –Cha Distribute ion Betwe nport's Lo tual Exclus Broadcas - Distribu	40 tributed Systems eous Applica llenges- Systems - en Distribu gical Clock; sion – Nor t Algorithm uted Dead	60 stems ations ar hou stem Mo - Client- uted Obj Hou : Vector - Token n – Distr lock-Det Hou nared Mo	100 nd urs: 09 odels - Server ects – urs: 09 Clock; Based ibuted ection urs: 09 emory
PrerequisiteObjectives• To introduceObjectives• To Learn the• To Learn the• To Learn the• To Learn the• On successful construction• Design Mide• Create a Ding• Design of F• Design of FUNIT – IDistributed SystimationIntroduction – Examples of DistriIntroduction – Architectural ModeCommunication – Distributed ObRemote Procedure Call – Events andUNIT – IIDistributed OpIntroduction – Issues – CommuniCausal Ordering; Global State; CAlgorithms – Lamport's AlgorithmDeadlock Detection – Issues –Algorithms. Agreement ProtocolsUNIT – IIIDistributed ResIntroduction - Distributed File systing– Architecture – Algorithm – ProtocolsVITT – IVFailure RecoveringRecovery – Introduction – basic ofRecovery in Concurrent Systems –Introduction – Commit ProtocolsProtocols – Failure Resilient proceUNIT – VNaming, SecuriIntroduction – Features of GoodMechanisms – Issues in DesigninDistributed Systems – IntroductioIntroduction to Real Time Oper	ce the Architecture, a ne Fundamental Princip ne Design of Distributed ompletion of the course deleware Components f istributed System throu- ces fault Tolerant Distributed tems Architecture, Typ buted Systems – Reso els – Functional Model ojects and Remote Invo nd Notifications ferating Systems faction Primitives – Inho Cuts; Termination Deten n - Token-Based Algorit Centralized Deadlock – Classification - Solution source Management tems – Architecture – I	ind types oles of Dis d Fault Tole , student for Distributed agh the in ed System oes and Re ource Shar ocation – herent Lim ection. Dis thms – Su -Detection ons –App Mechanis	and de tribute lerant s will k buted S tegrati ns emote ring an cteriza Comm nitation stribut uzuki-K n Algo lication ms – D	ed Oper System De able Systems ion of H e Proced ad the V tion of municat municat casami's prithms ns.	ating Syste s to: eterogene lure Call Web –Cha Distribute ion Betwe mport's Lo tual Exclu s Broadcas - Distribu	eous Applica eous Applica llenges- Sys d Systems - en Distribu gical Clock; sion – Nor t Algorithm uted Dead	ations ar ations ar Hou stem Mo - Client- uted Obj Hou - Client- uted Obj - Client- uted Obj - Client- - Clie	nd urs: 09 odels - Server jects – urs: 09 Clock; Based ibuted ection urs: 09 emory
Objectives• To introduct • To Learn th • On successful co • Design Mid • Create a Di Web servic • Design of FOutcomeOn successful co • Design Mid • Create a Di Web servic • Design of FUNIT – IDistributed SysIntroduction – Examples of Distri Introduction – Architectural Mode Communication – Distributed Ob Remote Procedure Call – Events a UNIT – IIUNIT – IIDistributed OpIntroduction – Issues – Communi Causal Ordering; Global State; C Algorithms – Lamport's Algorithm Deadlock Detection – Issues – Algorithms. Agreement ProtocolsUNIT – IIIDistributed Res Introduction - Distributed File syst – Architecture – Algorithm – Protocols Protocols – Failure Resilient proceUNIT – IVFailure Recover Failure Resilient proceUNIT – VNaming, Securi Introduction – Features of Good Mechanisms – Issues in Designin Distributed Systems – Introduction Introduction to Real Time Oper	ne Fundamental Princip ne Design of Distributed ompletion of the course deleware Components f istributed System throu- ces fault Tolerant Distributed tems Architecture, Typ ibuted Systems – Reso els – Functional Model ojects and Remote Invo nd Notifications ferating Systems ication Primitives – Inho Cuts; Termination Deten n - Token-Based Algorit Centralized Deadlock – Classification - Solution source Management tems – Architecture – I	bles of Dis d Fault To e, student for Distribush agh the in- ed System <b>bes and R</b> burce Shar burce Shar s - Charac ocation – herent Lim ection. Dis thms – Su -Detection ons –App Mechanis	tribute lerant s will b buted S tegrati ns emote ring an cteriza · Comm nitation stribut uzuki-K n Algo lication ms – D	ed Oper System De able Systems ion of H e Proced ad the V tion of municat municat casami's prithms ns.	ating Syste s to: eterogene lure Call Web –Cha Distribute ion Betwe mport's Lo tual Exclu s Broadcas - Distribu	ems eous Applica llenges- Sys d Systems - en Distribu gical Clock; sion – Nor t Algorithm uted Dead	Hou stem Mo - Client- uted Obj Hou : Vector n-Token n – Distr lock-Det Hou nared Mo	urs: 09 odels - Server ects – urs: 09 Clock; Based ibuted ection urs: 09 emory
Objectives• To Learn th • Design Mid • Design of FOutcomeOn successful • Create a Di Web servic • Design of FUNIT - IDistributed System • Communication - Distributed Tile system • Architecture - Algorithm - Protocols • Architecture - Algorithm - Protocols • Architecture - Algorithm - Protocols • Commit Protocols - Failure Resilient proce UNIT - VNaming, Securi Introduction - Features of Good Mechanisms - Issues in Designin Distributed Systems - Introductio Introduction to Real Time Oper	ne Fundamental Princip ne Design of Distributed ompletion of the course deleware Components f istributed System throu- ces fault Tolerant Distributed tems Architecture, Typ ibuted Systems – Reso els – Functional Model ojects and Remote Invo nd Notifications ferating Systems ication Primitives – Inho Cuts; Termination Deten n - Token-Based Algorit Centralized Deadlock – Classification - Solution source Management tems – Architecture – I	bles of Dis d Fault To e, student for Distribush agh the in- ed System <b>bes and R</b> burce Shar burce Shar s - Charac ocation – herent Lim ection. Dis thms – Su -Detection ons –App Mechanis	tribute lerant s will b buted S tegrati ns emote ring an cteriza · Comm nitation stribut uzuki-K n Algo lication ms – D	ed Oper System De able Systems ion of H e Proced ad the V tion of municat municat casami's prithms ns.	ating Syste s to: eterogene lure Call Web –Cha Distribute ion Betwe mport's Lo tual Exclu s Broadcas - Distribu	ems eous Applica llenges- Sys d Systems - en Distribu gical Clock; sion – Nor t Algorithm uted Dead	Hou stem Mo - Client- uted Obj Hou : Vector n-Token n – Distr lock-Det Hou nared Mo	urs: 09 odels - Server ects – urs: 09 Clock; Based ibuted ection urs: 09 emory
<ul> <li>To Learn the</li> <li>On successful consumption</li> <li>Design Midil</li> <li>Create a Dingeneration</li> <li>Design of F</li> <li>UNIT – I</li> <li>Distributed Systimation</li> <li>Distributed Systimation</li> <li>Distributed Ob</li> <li>Remote Procedure Call – Events and</li> <li>UNIT – II</li> <li>Distributed Op</li> <li>Introduction – Issues – Communication – Issues – Communication</li> <li>Lamport's Algorithm</li> <li>Deadlock Detection – Issues –</li> <li>Algorithms – Lamport's Algorithm</li> <li>Deadlock Detection – Issues –</li> <li>Algorithms. Agreement Protocols</li> <li>UNIT – III</li> <li>Distributed Ression</li> <li>Architecture – Algorithm – Protocols</li> <li>Architecture – Algorithm – Protocols</li> <li>Protocols – Failure Resilient proce</li> <li>UNIT – V</li> <li>Naming, Securi</li> <li>Introduction – Features of Good</li> <li>Mechanisms – Issues in Designin</li> <li>Distributed Systems – Introduction</li> </ul>	ne Design of Distributed ompletion of the course deleware Components f istributed System throu- es iault Tolerant Distribute tems Architecture, Typ buted Systems – Reso els – Functional Model ojects and Remote Inve nd Notifications rerating Systems ication Primitives – Inh cuts; Termination Deten n - Token-Based Algorit Centralized Deadlock – Classification - Solution source Management tems – Architecture – I	d Fault To e, student for Distribugh the in- ed System <b>bes and Re</b> burce Shar ls - Characo ocation – herent Lim ection. Dis thms – Su -Detection ons –App Mechanis	lerant i s will k buted S tegrati ns emote ring an cteriza Comm nitation stribut uzuki-K n Algo lication ms – D	System be able Systems ion of H e Procect nd the V tion of municat municat ns - Lar ced Mu (asami's prithms ns.	s to: eterogene lure Call Web –Cha Distribute ion Betwe nport's Lo tual Exclus s Broadcas - Distribu	eous Applica llenges- Sys d Systems - en Distribu gical Clock; sion – Nor t Algorithm uted Dead	Hou stem Mo - Client- uted Obj Hou : Vector - Token n – Distr lock-Det Hou nared M	urs: 09 odels - Server ects – urs: 09 Clock; Based ibuted ection urs: 09 emory
OutcomeOn successful co 	mpletion of the course addeware Components f istributed System throu eas fault Tolerant Distribute tems Architecture, Typ buted Systems – Reso els – Functional Model ojects and Remote Invo nd Notifications ferating Systems faction Primitives – Inh cuts; Termination Dete n - Token-Based Algorit Centralized Deadlock – Classification - Solution source Management tems – Architecture – I	e, student for Distrib ugh the in ed System <b>Des and Ro</b> ource Shar ls - Charac ocation – nerent Lim ection. Dis thms – Su -Detection ons – App Mechanis	s will b buted S tegrati ns emote ring an cteriza Comm nitation stribut uzuki-K n Algo lication ms – D	e Procect and the V tion of H tion of municat ns - Lar casami's prithms ns.	to: eterogene lure Call Web –Cha Distribute ion Betwe nport's Lo tual Exclus s Broadcas - Distribu	llenges- Sys d Systems - en Distribu gical Clock; sion – Nor t Algorithm uted Dead	Hou stem Mo - Client- uted Obj Hou : Vector - Token n – Distr lock-Det Hou nared M	urs: 09 odels - Server ects – urs: 09 Clock; Based ibuted ection urs: 09 emory
Outcome• Design MidOutcome• Create a Di Web servic • Design of FUNIT – IDistributed SystemIntroduction – Examples of Distri Introduction – Architectural Mode Communication – Distributed Ob Remote Procedure Call – Events and UNIT – IIUNIT – IIDistributed OpIntroduction – Issues – Communi Causal Ordering; Global State; C Algorithms – Lamport's Algorithm Deadlock Detection – Issues – Algorithms. Agreement Protocols UNIT – IIIDistributed ResIntroduction - Distributed File system – Architecture – Algorithm – Protocols Protocols – Failure Resilient proceUNIT – IVFailure Recover Failure Recover Introduction – Commit Protocols Protocols – Failure Resilient proceUNIT – VNaming, Securi Introduction – Issues – Introduction Introduction – Sues in Designin Distributed Systems – Introductio Introduction to Real Time Oper	Idleware Components f istributed System throu eas ault Tolerant Distribute tems Architecture, Typ ibuted Systems – Reso els – Functional Model ojects and Remote Invo nd Notifications erating Systems ication Primitives – Inh Cuts; Termination Deten - Token-Based Algorit Centralized Deadlock – Classification - Solution source Management tems – Architecture – I	for Distributed agh the in- ed System <b>bes and R</b> burce Shar ocation – nerent Lim ection. Dis thms – Su -Detection ons – App Mechanis	outed S tegrati ns emote ring an cteriza · Comm nitation stribut uzuki-K n Algo lication ms – D	Systems ion of H e Proced nd the V tion of municat municat casami's prithms ns. Design I	eterogene lure Call Web –Cha Distribute ion Betwe mport's Lo tual Exclu- s Broadcas - Distribu	llenges- Sys d Systems - en Distribu gical Clock; sion – Nor t Algorithm uted Dead	Hou stem Mo - Client- uted Obj Hou : Vector - Token n – Distr lock-Det Hou nared M	urs: 09 odels - Server ects – urs: 09 Clock; Based ibuted ection urs: 09 emory
Outcome• Create a Di Web servic• Design of FUNIT – IDistributed SystemIntroduction – Examples of DistriIntroduction – Architectural ModelCommunication – Distributed Ob Remote Procedure Call – Events and UNIT – IIUNIT – IIDistributed OpIntroduction – Issues – Communic Causal Ordering; Global State; C Algorithms – Lamport's Algorithm Deadlock Detection – Issues – Algorithms. Agreement Protocols UNIT – IIIDistributed RessIntroduction - Distributed File system – Architecture – Algorithm – Protocols Entroduction – Distributed File system – Architecture – Algorithm – Protocols Protocols – Failure Resilient proce UNIT – VNaming, Securi Introduction – Features of Good Mechanisms – Issues in Designin Distributed Systems – Introductio Introduction to Real Time Oper	stributed System throu es ault Tolerant Distribute tems Architecture, Typ buted Systems – Reso els – Functional Model ojects and Remote Invo nd Notifications erating Systems cation Primitives – Inh Cuts; Termination Deten n - Token-Based Algorit Centralized Deadlock – Classification - Solution source Management tems – Architecture – I	agh the in ed System pes and Ra ource Shar is - Charac ocation – herent Lim ection. Dis thms – Su -Detection ons –App Mechanis Distributeo	tegrati ns emote ring an cteriza · Comn nitation stribut uzuki-K n Algo lication ms – D	e Proced and the V tion of municat ns - Lar ced Mu (asami's prithms ns.	eterogene lure Call Web –Cha Distributer ion Betwe mport's Lo tual Exclus 5 Broadcas - Distribu ssues – Dis	llenges- Sys d Systems - en Distribu gical Clock; sion – Nor t Algorithm uted Dead	Hou stem Mo - Client- uted Obj Hou : Vector - Token n – Distr lock-Det Hou nared M	urs: 09 odels Serve ects - urs: 09 Clock Basec ibutec ectior urs: 09 emory
Web servic• Design of FUNIT – IDistributed SysiIntroduction – Examples of DistriIntroduction – Architectural ModeCommunication – Distributed ObRemote Procedure Call – Events atUNIT – IIDistributed OpIntroduction – Issues – CommuniCausal Ordering; Global State; CAlgorithms – Lamport's AlgorithmDeadlock Detection – Issues –Algorithms. Agreement ProtocolsUNIT – IIIDistributed ResIntroduction - Distributed File syst– Architecture – Algorithm – ProtocolsUNIT – IVFailure RecoverRecovery – Introduction – basic ofRecovery in Concurrent Systems –Introduction – Commit ProtocolsProtocols – Failure Resilient proceUNIT – VNaming, SecuriIntroduction – Features of GoodMechanisms – Issues in DesignirDistributed Systems – IntroductioIntroduction to Real Time Oper	ess ault Tolerant Distribute tems Architecture, Typ buted Systems – Reso els – Functional Model ojects and Remote Invo nd Notifications erating Systems cation Primitives – Inh Cuts; Termination Dete n - Token-Based Algorit Centralized Deadlock – Classification - Solution source Management tems – Architecture – I	ed System Des and Re Durce Shar ls - Characo ocation – Derent Lim ection. Dis thms – Su -Detection ons –App Mechanis Distributeo	ns emote ring an cteriza · Comn nitation stribut uzuki-K n Algo lication ms – D	e Proced nd the V tion of nunicat ns - Lar ced Mu (asami's prithms ns. Design I	lure Call Web –Cha Distribute ion Betwe nport's Lo tual Exclus Broadcas - Distribu	llenges- Sys d Systems - en Distribu gical Clock; sion – Nor t Algorithm uted Dead	Hou stem Mo - Client- uted Obj Hou : Vector - Token n – Distr lock-Det Hou nared M	urs: 09 odels Serve ects - urs: 09 Clock Basec ibutec ectior urs: 09 emory
Design of F     Distributed Syss Introduction – Examples of Distri Introduction – Architectural Mode Communication – Distributed Ob Remote Procedure Call – Events a UNIT – II Distributed Op Introduction – Issues – Communi Causal Ordering; Global State; C Algorithms – Lamport's Algorithm Deadlock Detection – Issues – Algorithms. Agreement Protocols UNIT – III Distributed Res Introduction - Distributed File syst – Architecture – Algorithm – Protoc UNIT – IV Failure Recover Recovery – Introduction – basic o Recovery in Concurrent Systems – Introduction – Commit Protocols Protocols – Failure Resilient proce UNIT – V Naming, Securi Introduction – Features of Good Mechanisms – Issues in Designin Distributed Systems – Introductio Introduction to Real Time Oper	ault Tolerant Distribute tems Architecture, Typ buted Systems – Reso els – Functional Model ojects and Remote Invo nd Notifications erating Systems ication Primitives – Inh Cuts; Termination Deten n - Token-Based Algorit Centralized Deadlock – Classification - Solution source Management tems – Architecture – I	bes and R burce Shar s - Charac ocation – herent Lim ection. Dis thms – Su -Detection ons –App Mechanis	emote ring an cteriza · Comm nitation stribut uzuki-K n Algo lication ms – D	nd the V tion of municat ns - Lar ced Mu (asami's prithms ns. Design I	Web –Cha Distribute ion Betwe nport's Lo tual Exclus s Broadcas - Distribu ssues – Dis	d Systems - en Distribu gical Clock; sion – Nor t Algorithm uted Dead	stem Mo – Client- uted Obj Hou : Vector n-Token n – Distr lock-Det Hou nared Mo	odels Serve ects - urs: 09 Clock Based ibuted ection urs: 09 emory
UNIT – IDistributed SystemIntroduction – Examples of DistriIntroduction – Architectural ModelCommunication – Distributed ObleRemote Procedure Call – Events andUNIT – IIDistributed OpleIntroduction – Issues – CommuniCausal Ordering; Global State; CAlgorithms – Lamport's AlgorithmDeadlock Detection – Issues –Algorithms. Agreement ProtocolsUNIT – IIIDistributed ResIntroduction - Distributed File syste– Architecture – Algorithm – ProtocolsUNIT – IVFailure RecoverRecovery – Introduction – basic ofRecovery in Concurrent Systems –Introduction – Commit ProtocolsProtocols – Failure Resilient proceUNIT – VNaming, SecuriIntroduction – Features of GoodMechanisms – Issues in DesignirDistributed Systems – IntroductioIntroduction to Real Time Oper	tems Architecture, Typ buted Systems – Reso els – Functional Model ojects and Remote Invo nd Notifications erating Systems ication Primitives – Inh Cuts; Termination Dete n - Token-Based Algorit Centralized Deadlock – Classification - Solution source Management tems – Architecture – I	bes and R burce Shar s - Charac ocation – herent Lim ection. Dis thms – Su -Detection ons –App Mechanis	emote ring an cteriza · Comm nitation stribut uzuki-K n Algo lication ms – D	nd the V tion of municat ns - Lar ced Mu (asami's prithms ns. Design I	Web –Cha Distribute ion Betwe nport's Lo tual Exclus s Broadcas - Distribu ssues – Dis	d Systems - en Distribu gical Clock; sion – Nor t Algorithm uted Dead	stem Mo – Client- uted Obj Hou : Vector n-Token n – Distr lock-Det Hou nared Mo	odels Serve ects - urs: 09 Clock Basec ibutec ectior urs: 09 emory
Introduction – Examples of DistriIntroduction – Architectural ModeCommunication – Distributed ObRemote Procedure Call – Events atUNIT – IIDistributed OpIntroduction – Issues – CommuniCausal Ordering; Global State; CAlgorithms – Lamport's AlgorithmDeadlock Detection – Issues –Algorithms. Agreement ProtocolsUNIT – IIIDistributed RegIntroduction - Distributed File syst– Architecture – Algorithm – ProtocolsUNIT – IVFailure RecoverRecovery – Introduction – basic ofRecovery in Concurrent Systems –Introduction – Commit ProtocolsProtocols – Failure Resilient proceUNIT – VNaming, SecuriIntroduction – Features of GoodMechanisms – Issues in DesignirDistributed Systems – IntroductioIntroduction to Real Time Oper	buted Systems – Reso els – Functional Model ojects and Remote Invo nd Notifications erating Systems cation Primitives – Inh Cuts; Termination Dete n - Token-Based Algorit Centralized Deadlock – Classification - Solution source Management tems – Architecture – I	nerent Lim ection. Dis - Detection ons – App Mechanis	ring an cteriza · Comn nitation stribut uzuki-K n Algo lication ms – D	nd the V tion of municat ns - Lar ced Mu (asami's prithms ns. Design I	Web –Cha Distribute ion Betwe nport's Lo tual Exclus s Broadcas - Distribu ssues – Dis	d Systems - en Distribu gical Clock; sion – Nor t Algorithm uted Dead	stem Mo – Client- uted Obj Hou : Vector n-Token n – Distr lock-Det Hou nared Mo	odels Serve ects - urs: 09 Clock Based ibuted ection urs: 09 emory
Introduction – Architectural ModeCommunication – Distributed ObRemote Procedure Call – Events atUNIT – IIDistributed OpIntroduction – Issues – CommuniCausal Ordering; Global State; CAlgorithms – Lamport's AlgorithmDeadlock Detection – Issues –Algorithms – Lamport's AlgorithmDeadlock Detection – Issues –Algorithms – Kareement ProtocolsUNIT – IIIDistributed ResIntroduction - Distributed File syst– Architecture – Algorithm – ProtocolsOrdering: Global State; CAlgorithms – Lamport's AlgorithmDeadlock Detection – Issues –Algorithms - Lamport's AlgorithmDeadlock Detection – Issues –Algorithms - Lamport's AlgorithmDistributed ResIntroduction - Distributed ResOutputArchitecture – Algorithm – ProtocolsProtocols – Failure Resovery –Introduction – Commit ProtocolsProtocols – Failure Resilient proceUNIT – VNaming, SecuriIntroduction – Features of GoodMechanisms – Issues in DesigninDistributed Systems – IntroductioIntroduction to Real Time Oper	els – Functional Model ojects and Remote Inve nd Notifications <b>erating Systems</b> fication Primitives – Inh Cuts; Termination Dete n - Token-Based Algorit Centralized Deadlock – Classification - Solution source Management tems – Architecture – I	s - Charac ocation – herent Lim ection. Dis thms – Su -Detection ons –App Mechanis	cteriza Comm nitation stribut uzuki-K n Algo lication ms – D	tion of municat ns - Lar ced Mu (asami's prithms ns. Design I	Distribute ion Betwe nport's Lo tual Exclus Broadcas - Distribu ssues – Dis	d Systems - en Distribu gical Clock; sion – Nor t Algorithm uted Dead	- Client- uted Obj Hou : Vector n-Token n – Distr lock-Det Hou nared M	Serve ects - urs: 09 Clock Basec ibutec ectior urs: 09 emory
Communication – Distributed Ob Remote Procedure Call – Events a UNIT – IIDistributed OpIntroduction – Issues – Communi Causal Ordering; Global State; C Algorithms – Lamport's Algorithm Deadlock Detection – Issues – Algorithms. Agreement Protocols UNIT – IIIDistributed ResIntroduction - Distributed File syst – Architecture – Algorithm – Protocols UNIT – IVFailure Recovery Recovery in Concurrent Systems – Introduction – Commit Protocols Protocols – Failure Resilient proce UNIT – VNaming, Securi Introduction – Features of Good Mechanisms – Issues in Designin Distributed Systems – Introductio Introduction to Real Time Oper	pjects and Remote Inve nd Notifications erating Systems cation Primitives – Inh Cuts; Termination Dete n - Token-Based Algorit Centralized Deadlock – Classification - Solution source Management tems – Architecture – I	nerent Lim ection. Dis thms – Su -Detection ons –App Mechanis Distributed	Comn nitation stribut uzuki-K n Algo lication ms – D	nunicat ns - Lar ced Mu Casami's prithms ns. Design I	ion Betwe nport's Lo tual Exclus Broadcas - Distribu	en Distribu gical Clock; sion – Nor t Algorithm uted Dead	Hou Hou Vector n-Token n – Distr lock-Det Hou nared M	ects - urs: 09 Clock Basec ibutec ectior urs: 09 emory
Remote Procedure Call – Events aUNIT – IIDistributed OpIntroduction – Issues – CommuniCausal Ordering; Global State; CAlgorithms – Lamport's AlgorithmDeadlock Detection – Issues –Algorithms. Agreement ProtocolsUNIT – IIIDistributed ResIntroduction - Distributed File syst– Architecture – Algorithm – ProtocolsUNIT – IVFailure RecoverRecovery – Introduction – basic ofRecovery – Introduction – basic ofProtocols – Failure Resilient proceUNIT – VNaming, SecuriIntroduction – Features of GoodMechanisms – Issues in DesignirDistributed Systems – IntroductioIntroduction to Real Time Oper	nd Notifications erating Systems cation Primitives – Inh Cuts; Termination Dete n - Token-Based Algorit Centralized Deadlock – Classification - Solution source Management tems – Architecture – I	nerent Lim ection. Dis thms – Su -Detection ons –App Mechanis Distributed	nitation stribut uzuki-K n Algc lication ms – D	ns - Lar ced Mu casami's prithms ns. Design I	nport's Lo tual Exclus s Broadcas - Distribu ssues – Dis	gical Clock; sion – Nor t Algorithm uted Dead	Hou Vector n-Token n – Distr lock-Det Hou nared M	Clock Basec ibutec ectior urs: 09
UNIT – IIDistributed OpIntroduction – Issues – CommuniCausal Ordering; Global State; CAlgorithms – Lamport's AlgorithmDeadlock Detection – Issues –Algorithms. Agreement ProtocolsUNIT – IIIDistributed ResIntroduction - Distributed File syst– Architecture – Algorithm – ProtocolsUNIT – IVFailure RecoverRecovery – Introduction – basic ofRecovery in Concurrent Systems –Introduction – Commit ProtocolsProtocols – Failure Resilient proceUNIT – VNaming, SecuriIntroduction – Features of GoodMechanisms – Issues in DesignirDistributed Systems – IntroductioIntroduction to Real Time Oper	erating Systems ication Primitives – Inh Cuts; Termination Dete n - Token-Based Algorit Centralized Deadlock – Classification - Solution source Management tems – Architecture – I	ection. Dis thms – Su -Detection ons –App Mechanis Distributed	stribut uzuki-K n Algo lication ms – D	ced Mu Casami's prithms ns. Design I	tual Exclu Broadcas - Distrib ssues – Dis	sion – Nor t Algorithm uted Dead	: Vector n-Token n – Distr lock-Det <b>Hou</b> nared M	Clock Based ibuted ection urs: 09 emory
Introduction – Issues – CommuniCausal Ordering; Global State; CAlgorithms – Lamport's AlgorithmDeadlock Detection – Issues –Algorithms. Agreement ProtocolsUNIT – IIIDistributed ResIntroduction - Distributed File syst– Architecture – Algorithm – ProtocUNIT – IVFailure RecoverRecovery – Introduction – basic ofRecovery – Introduction – basic ofProtocols – Failure Resilient proceUNIT – VNaming, SecuriIntroduction – Features of GoodMechanisms – Issues in DesigninDistributed Systems – IntroductioIntroduction to Real Time Oper	cation Primitives – Inh Cuts; Termination Dete n - Token-Based Algorit Centralized Deadlock – Classification - Solution source Management tems – Architecture – I	ection. Dis thms – Su -Detection ons –App Mechanis Distributed	stribut uzuki-K n Algo lication ms – D	ced Mu Casami's prithms ns. Design I	tual Exclu Broadcas - Distrib ssues – Dis	sion – Nor t Algorithm uted Dead	: Vector n-Token n – Distr lock-Det <b>Hou</b> nared M	Clock Based ibuted ection urs: 09 emory
Causal Ordering; Global State; CAlgorithms – Lamport's AlgorithmDeadlock Detection – Issues –Algorithms. Agreement ProtocolsUNIT – IIIDistributed ResIntroduction - Distributed File syst– Architecture – Algorithm – ProtocolsUNIT – IVFailure RecoverRecovery – Introduction – basic ofRecovery in Concurrent Systems –Introduction – Commit ProtocolsProtocols – Failure Resilient proceUNIT – VNaming, SecuriIntroduction – Features of GoodMechanisms – Issues in DesigninDistributed Systems – IntroductioIntroduction to Real Time Oper	Cuts; Termination Deten n - Token-Based Algorit Centralized Deadlock – Classification - Solutio source Management tems – Architecture – I	ection. Dis thms – Su -Detection ons –App Mechanis Distributed	stribut uzuki-K n Algo lication ms – D	ced Mu Casami's prithms ns. Design I	tual Exclu Broadcas - Distrib ssues – Dis	sion – Nor t Algorithm uted Dead	n-Token n – Distri lock-Det <b>Hot</b> nared M	Based ibuted ection urs: 09 emory
Algorithms – Lamport's AlgorithmDeadlock Detection – Issues –Algorithms. Agreement ProtocolsUNIT – IIIDistributed ResIntroduction - Distributed File syst– Architecture – Algorithm – ProtocolsUNIT – IVFailure RecoverRecovery – Introduction – basic ofRecovery in Concurrent Systems –Introduction – Commit ProtocolsProtocols – Failure Resilient proceUNIT – VNaming, SecuriIntroduction – Features of GoodMechanisms – Issues in DesigninDistributed Systems – IntroductioIntroduction to Real Time Oper	n - Token-Based Algorit Centralized Deadlock – Classification - Soluti source Management tems – Architecture – I	thms – Su -Detection ons –App Mechanis Distributec	uzuki-K n Algo lication ms – D	Casami's prithms ns. Design I	Broadcas - Distrib	t Algorithm uted Dead	n – Distri lock-Det <b>Hou</b> nared M	ibuted ection urs: 09 emory
DeadlockDetectionIssuesAlgorithms.Agreement ProtocolsUNIT – IIIDistributed ResIntroduction - Distributed File syst– Architecture – Algorithm – ProtocolsUNIT – IVFailure RecoverRecovery – Introduction – basic ofRecovery in Concurrent Systems –Introduction – Commit ProtocolsProtocols – Failure Resilient proceUNIT – VNaming, SecuriIntroduction – Features of GoodMechanisms – Issues in DesigninDistributed Systems – IntroductioIntroduction to Real Time Oper	Centralized Deadlock – Classification - Solution source Management tems – Architecture – I	-Detection ons –App Mechanis Distributec	n Algo lication ms – D	orithms ns. Design I	- Distrib	uted Dead	lock-Det Hou nared M	ection urs: 0 emor
Algorithms. Agreement ProtocolsUNIT – IIIDistributed RegIntroduction - Distributed File syst– Architecture – Algorithm – ProtocolsUNIT – IVFailure RecoverRecovery – Introduction – basic ofRecovery in Concurrent Systems –Introduction – Commit ProtocolsProtocols – Failure Resilient proceUNIT – VNaming, SecuriIntroduction – Features of GoodMechanisms – Issues in DesigninDistributed Systems – IntroductionIntroduction to Real Time Oper	– Classification - Soluti source Management tems – Architecture – I	ons –App Mechanis Distributec	lication ms – D	ns. Design I	ssues – Dis	stributed Sh	Hou nared M	u <b>rs: 0</b> 9 emor
UNIT – IIIDistributed ResIntroduction - Distributed File syst– Architecture – Algorithm – ProtoUNIT – IVFailure RecoverRecovery – Introduction – basicRecovery in Concurrent Systems –Introduction – Commit ProtocolsProtocols – Failure Resilient proceUNIT – VNaming, SecuriIntroduction – Features of GoodMechanisms – Issues in DesignirDistributed Systems – IntroductioIntroduction to Real Time Oper	<b>source Management</b> tems – Architecture – I	Mechanis Distributec	ms – D	Design I			nared M	emor
Introduction - Distributed File syst– Architecture – Algorithm – ProtoconUNIT – IVFailure RecoverRecovery – Introduction – basic ofRecovery in Concurrent Systems –Introduction – Commit ProtocolsProtocols – Failure Resilient proceUNIT – VNaming, SecuriIntroduction – Features of GoodMechanisms – Issues in DesigninDistributed Systems – IntroductioIntroduction to Real Time Oper	tems – Architecture – I	istributed		-			nared M	emor
– Architecture – Algorithm – Proto         UNIT – IV       Failure Recover         Recovery – Introduction – basic of         Recovery in Concurrent Systems –         Introduction – Commit Protocols         Protocols – Failure Resilient proce         UNIT – V       Naming, Securi         Introduction – Features of Good         Mechanisms – Issues in Designin         Distributed Systems – Introductio         Introduction to Real Time Oper		istributed		-				
UNIT – IVFailure RecoverRecovery – Introduction – basicRecovery in Concurrent Systems –Introduction – Commit ProtocolsProtocols – Failure Resilient proceUNIT – VNaming, SecuriIntroduction – Features of GoodMechanisms – Issues in DesignirDistributed Systems – IntroductioIntroduction to Real Time Oper			JSCHE	duling		omponent	s – Algui	1111110
Recovery – Introduction – basic of Recovery in Concurrent Systems – Introduction – Commit Protocols Protocols – Failure Resilient proceUNIT – VNaming, Securi Introduction – Features of Good Mechanisms – Issues in Designin Distributed Systems – Introductio Introduction to Real Time Oper				uunng –	- issues – C		La	urs: 09
Recovery in Concurrent Systems – Introduction – Commit Protocols Protocols – Failure Resilient proce UNIT – V Naming, Securi Introduction – Features of Good Mechanisms – Issues in Designir Distributed Systems – Introductio Introduction to Real Time Oper		on of Eail	luroc	Packa	ard and E	onward Err		
Introduction – Commit Protocols Protocols – Failure Resilient proce UNIT – V Naming, Securi Introduction – Features of Good Mechanisms – Issues in Designin Distributed Systems – Introductio Introduction to Real Time Oper	•							,
Protocols – Failure Resilient proceUNIT – VNaming, SecuriIntroduction – Features of GoodMechanisms – Issues in DesigninDistributed Systems – IntroductioIntroduction to Real Time Oper	• •			•	-	•		
UNIT – V Naming, Securi Introduction – Features of Good Mechanisms – Issues in Designir Distributed Systems – Introductio Introduction to Real Time Oper		-	oung	protoco	JIS – Dyria	inic voting	Reassig	inten
Introduction – Features of Good Mechanisms – Issues in Designin Distributed Systems – Introductio Introduction to Real Time Oper	ity and Real Time Oper		tem				Но	urs: 09
Mechanisms – Issues in Designin Distributed Systems – Introductio Introduction to Real Time Oper		• •		System_	Oriented	Names $-0$		
Distributed Systems – Introductio Introduction to Real Time Oper			•	•			-	
Introduction to Real Time Oper	-				-		-	
-						-	-	
Scheduling	uting System Desig	,11 1550C5	in ite		. Distribut	cu System	5 100	
	Total Tutorials: 15	Total	Practic	cal Class	ses: -	Total Hou	rs: 60	
Text Books:								
1. Mukesh Singhal, and Nir	ranian Shivratri Distri	huted Or	eratin	ø Svste	m New I	Delhi <sup>.</sup> Tata	McGrav	∧ Hill
Seventh Reprint, 2007		outer op		8 - 7000				
2. Andrew S. Tanenbaum,	Maarten Van Steen	Distribut	ed Svs	stems P	rinciples A	And Paradia	gms . Pe	earsor
Prentice Hall, Second Editi							5, .	
Reference Books:								
1. George Coulouris, Jean D								
Education, 2009	ion, 2007.	lberg, Dis	tribute	ed Svst	ems Conce	epts and De	esign. Pe	arsor
2. Sunita Mahajan and Seem	ion, 2007.	lberg, Dis	tribute	ed Syste	ems Conce	epts and De	esign, Pe	arsor
Websites :	ion, 2007. Pollimore and Tim Kind	_		-		-	-	
1. http://nptel.ac.in	ion, 2007. Pollimore and Tim Kind	_		-		-	-	

	Computer Science and Engineering	_			(Distribute	ed Syste	ms)	
Semester : (	Dne	Categor	-					
Subject Code	Course Name		rs / Wee T	1	Credit		mum N SE	larks TM
CS152	High Performance Networks	L 3	1	Р	<b>C</b> 4	<b>CA</b> 40	60	100
Prerequisite		5		-	4	40	00	100
	To introduce the concepts, te	echniques and a	oplicatio	ons of (	Computer	Networ	ks.	
Objectives	<ul> <li>To educate about layered c control algorithms.</li> <li>To give ideas and insights o networks.</li> </ul>	communication a	architec	ture, r	outing alg	orithms	s, conge	estion puter
Outcome	At the end of the course the students • Understand the advanced to	pics in the field	•					
	Gain knowledge about routin	ng, switching and	netwo	rk conf	iguration	ma	anagem	
UNIT – I	Introduction to Networks							rs: 09
	computer networks(Definition, Types							
	works - High speed LANs – Fast Etherne	et - Switched Fas	t Ethern	net - Gi	gabit Ethe	rnet – Is	SDN – B	-ISDN
	elay - operations and layers.							
UNIT – II	SONET and ATM					lut i l		rs: 09
Cell format and	SONET – SONET/SDH Layers – SONET I Switching Principles – Protocol Archite acket header – User services – Protoco	ecture – Service	categor	ies. T	P/IP proto	ocol Suit		
UNIT – III	Congestion Control and Traffic Mana	agement					Hou	rs: 09
Congestion cor	ntrol in Data Networks and Internets	s – Effects of C	Congesti	on –	Congestio	n Conti	rol in F	Packet
Traffic and Cor	rorks. Frame relay Congestion Control ngestion Control – Attributes – Traffi TCP Traffic Control – Flow Control –	c Management	Framev	vork –	Traffic Co	ontrol -	- ABR 1	Traffic
UNIT – IV								
	OoS and Introduction to Cisco						Hou	rs: 09
	QoS and Introduction to Cisco Quality of Service - Integrated Servi	ices – Differenti	ated Se	rvices	– Protocol	s for Q		
Introduction to	Quality of Service - Integrated Servi						oS sup	port -
Introduction to Resource Rese		abel Switching	(MPLS)	) — R	eal-Time	Transp	oS sup ort Pro	port - ptocol
Introduction to Resource Rese (RTP). Multime	Quality of Service - Integrated Servi ervation (RSVP) – Multiprotocol La	abel Switching edia over the in	(MPLS) - ternet	) — R - IP mւ	eal-Time Ilticasting	Transp – VOIP.	oS sup ort Pro Introdu	port - otocol uction
Introduction to Resource Rese (RTP). Multime to the Cisco I	Quality of Service - Integrated Servi ervation (RSVP) – Multiprotocol La edia services – Transmission of multim OS – Cisco user interface – Router	abel Switching edia over the in	(MPLS) - ternet	) — R - IP mւ	eal-Time Ilticasting	Transp – VOIP.	oS sup ort Pro Introdu	port - otocol uction
Introduction to Resource Rese (RTP). Multime	Quality of Service - Integrated Servi ervation (RSVP) – Multiprotocol La edia services – Transmission of multim OS – Cisco user interface – Router	abel Switching edia over the in	(MPLS) - ternet	) — R - IP mւ	eal-Time Ilticasting	Transp – VOIP.	oS sup ort Pro Introdu r interf	otocol uction
Introduction to Resource Rese (RTP). Multime to the Cisco I Configuration n <b>UNIT – V</b>	Quality of Service - Integrated Servi ervation (RSVP) – Multiprotocol La edia services – Transmission of multim OS – Cisco user interface – Router nanagement.	abel Switching edia over the in and Switch Ad	(MPLS) ternet – ministra	) – R - IP mu ative f	eal-Time Ilticasting unction –	Transp – VOIP. Routei	oS sup ort Pro Introdu r interf <b>Hou</b>	port - ptocol uction ace - rs: 09
Introduction to Resource Rese (RTP). Multime to the Cisco I Configuration n UNIT – V Introduction to	Quality of Service - Integrated Servi ervation (RSVP) – Multiprotocol La edia services – Transmission of multim OS – Cisco user interface – Router nanagement. Optical Networks	abel Switching edia over the in and Switch Ad sion multiplexir	(MPLS) ternet – ministra	) – R - IP mu ative f M) – Ir	eal-Time Ilticasting unction – htroductio	Transp – VOIP. Router n to br	oS sup ort Pro Introdu r interf Hou	port - ptocol uction ace - rs: 09 t-and-
Introduction to Resource Rese (RTP). Multime to the Cisco I Configuration n <b>UNIT – V</b> Introduction to select networks	Quality of Service - Integrated Servi ervation (RSVP) – Multiprotocol La edia services – Transmission of multim OS – Cisco user interface – Router nanagement. Optical Networks – Wavelength divi	abel Switching edia over the in and Switch Ad sion multiplexin ssing – Wavelen	(MPLS) ternet – ministra g (WDI gth rout	) – R - IP mu ative f M) – Ir ted net	eal-Time Ilticasting unction – htroduction	Transp – VOIP. Router n to br witch a	oS sup ort Pro Introdu r interf Hour roadcast	port - otocol uction ace – rs: 09 t-and- ures -
Introduction to Resource Rese (RTP). Multime to the Cisco I Configuration n <b>UNIT – V</b> Introduction to select networks	Quality of Service - Integrated Servi ervation (RSVP) – Multiprotocol La edia services – Transmission of multim OS – Cisco user interface – Router nanagement. Optical Networks Optical networks – Wavelength divi s - Switch architectures - channel acces avelength assignment – virtual topolog	abel Switching edia over the in and Switch Ad sion multiplexin ssing – Wavelen	(MPLS) ternet – ministra g (WDI gth rout	) – R - IP mu ative f M) – Ir ted net	eal-Time Ilticasting unction – htroduction	Transp – VOIP. Router n to br witch a	oS sup ort Pro Introdu r interf Hour roadcast	port - otocol uction ace – rs: 09 t-and- ures -
Introduction to Resource Rese (RTP). Multime to the Cisco II Configuration n UNIT – V Introduction to select networks Routing and wa	Quality of Service - Integrated Servi ervation (RSVP) – Multiprotocol La edia services – Transmission of multim OS – Cisco user interface – Router nanagement. Optical Networks Optical networks – Wavelength divi s - Switch architectures - channel acces evelength assignment – virtual topolog over WDM.	abel Switching edia over the in and Switch Ad sion multiplexin ssing – Wavelen	(MPLS) ternet – ministra ng (WDI gth rout r SONET	) – R - IP mu ative f M) – Ir ted net	eal-Time Ilticasting unction – htroduction	Transp – VOIP. Router n to br witch ar WDM –	oS sup ort Pro Introdu r interf Hour roadcast	port - otocol uction ace – rs: 09 t-and- ures -
Introduction to Resource Rese (RTP). Multime to the Cisco II Configuration n <b>UNIT – V</b> Introduction to select networks Routing and wa over WDM – IP	Quality of Service - Integrated Servi ervation (RSVP) – Multiprotocol La edia services – Transmission of multim OS – Cisco user interface – Router nanagement. Optical Networks Optical networks – Wavelength divi s - Switch architectures - channel acces evelength assignment – virtual topolog over WDM.	abel Switching edia over the in and Switch Ad sion multiplexir ssing – Wavelen y design– IP ove	(MPLS) ternet – ministra ng (WDI gth rout r SONET	) – R - IP mu ative f M) – Ir ted net	eal-Time Ilticasting unction – htroduction tworks – S ATM over	Transp – VOIP. Router n to br witch ar WDM –	oS sup ort Pro Introdu r interf Hour roadcast	port - otocol uction ace – rs: 09 t-and- ures -
Introduction to Resource Rese (RTP). Multime to the Cisco II Configuration in UNIT – V Introduction to select networks Routing and wa over WDM – IP Total contact H Text Books: 1. William	Quality of Service - Integrated Servier Quality of Service - Integrated Servier Quality of Service - Multiprotocol Later Content         Provide the services - Transmission of multime         OS - Cisco user interface - Router Content         Optical Networks         Optical Networks - Wavelength divier         S - Switch architectures - Channel access         Avelength assignment - virtual topology         over WDM.         Iours: 45         Total Tutorials: 15         Total Tutorials: 15	abel Switching edia over the in and Switch Ad sion multiplexir ssing – Wavelen y design– IP ove otal Practical Cla	(MPLS) ternet – ministra ng (WDI gth rout r SONET nsses: –	) – R - IP mu ative f M) – Ir ted net	eal-Time Ilticasting unction – htroduction tworks – Si ATM over	Transp – VOIP. Router n to br witch ar WDM – s: 60	oS sup ort Pro Introdu r interf Hou oadcast rchitect IP over	port - ptocol uction ace – rs: 09 t-and- ures - r ATM
Introduction to Resource Rese (RTP). Multime to the Cisco II Configuration in UNIT – V Introduction to select networks Routing and wa over WDM – IP Total contact H Text Books: 1. William	Quality of Service - Integrated Servier         ervation (RSVP) – Multiprotocol Lagedia services – Transmission of multim         OS – Cisco user interface – Router         nanagement.         Optical Networks         Optical networks – Wavelength divis         s - Switch architectures - channel acces         avelength assignment – virtual topology         over WDM.         Iours: 45       Total Tutorials: 15	abel Switching edia over the in and Switch Ad sion multiplexir ssing – Wavelen y design– IP ove otal Practical Cla	(MPLS) ternet – ministra ng (WDI gth rout r SONET nsses: –	) – R - IP mu ative f M) – Ir ted net	eal-Time Ilticasting unction – htroduction tworks – Si ATM over	Transp – VOIP. Router n to br witch ar WDM – s: 60	oS sup ort Pro Introdu r interf Hou oadcast rchitect IP over	port - ptocol uction ace – rs: 09 t-and- ures - r ATM
Introduction to Resource Rese (RTP). Multime to the Cisco I Configuration n UNIT – V Introduction to select networks Routing and wa over WDM – IP Total contact H Text Books: 1. William Pearson 2. Todd La	Quality of Service - Integrated Servier Vation (RSVP) – Multiprotocol Lateria services – Transmission of multim         OS – Cisco user interface – Router nanagement.         Optical Networks         Optical networks – Wavelength divistions - Switch architectures - channel access avelength assignment – virtual topology over WDM.         Iours: 45       Total Tutorials: 15         Total Tutorials: 15       Total Tutorials: 15	abel Switching edia over the in and Switch Ad sion multiplexir ssing – Wavelen y design– IP ove otal Practical Cla	(MPLS) ternet – ministra og (WDI gth rout r SONET sses: -	) – R - IP mu ative f M) – Ir ted net T over 7 nd Qua	eal-Time Ilticasting unction – htroduction tworks – Si ATM over Fotal Hour	Transp – VOIP. Router n to br witch ar WDM – s: 60 ervice ,	oS sup ort Pro Introdu r interf Hou roadcast rchitect IP over 2nd Ec	port - ptocol action ace – rs: 09 t-and- ures - r ATM
Introduction to Resource Rese (RTP). Multime to the Cisco II Configuration n UNIT – V Introduction to select networks Routing and wa over WDM – IP Total contact H Text Books: 1. William Pearson 2. Todd La 3. Dayana	Quality of Service - Integrated Service         Quality of Service - Integrated Service         ervation (RSVP) - Multiprotocol Lagedia services - Transmission of multim         OS - Cisco user interface - Router         nanagement.         Optical Networks         Optical networks - Wavelength divis         s - Switch architectures - channel acces         avelength assignment - virtual topology         over WDM.         Iours: 45       Total Tutorials: 15         Total Tutorials: 15       Total rutorials: 15         Mathematical Sybex, CCNA Intro - Study Guid         and Ambawade, Deven shah, Mahendra	abel Switching edia over the in and Switch Ad sion multiplexir ssing – Wavelen y design– IP ove otal Practical Cla nternets, perforr de . aMehra, Advanc	(MPLS) ternet – ministra ng (WDI gth rout r SONET nsses: - mance a	) – R - IP mu ative f M) – Ir ted net Tover / 1 nd Qua	eal-Time Ilticasting unction – htroduction tworks – Si ATM over <b>Fotal Hour</b> ality and S etwork, W	Transp – VOIP. Router n to br witch an WDM – s: 60 ervice ,	oS sup ort Pro Introdu r interf Hour oadcast rchitect IP over 2nd Ec	port - btocol uction ace - rs: 09 t-and- ures - r ATM dition,
Introduction to Resource Rese (RTP). Multime to the Cisco I Configuration n UNIT – V Introduction to select networks Routing and wa over WDM – IP Total contact H Text Books: 1. William Pearson 2. Todd La 3. Dayana 4. Rajiv Ra	Quality of Service - Integrated Servier         Quality of Service - Integrated Servier         ervation (RSVP) - Multiprotocol Lagedia services - Transmission of multim         OS - Cisco user interface - Router         nanagement.         Optical Networks         Optical networks - Wavelength divis         S - Switch architectures - channel access         avelength assignment - virtual topology         over WDM.         Iours: 45       Total Tutorials: 15         Total Tutorials: 15         Total Stallings, High-Speed Networks and Ir         n Education, 2002.         ammle, Sybex, CCNA Intro – Study Guidan         amaswami and Kumar N. Sivarajan, Op	abel Switching edia over the in and Switch Ad sion multiplexir ssing – Wavelen y design– IP ove otal Practical Cla nternets, perforr de . aMehra, Advanc	(MPLS) ternet – ministra ng (WDI gth rout r SONET nsses: - mance a	) – R - IP mu ative f M) – Ir ted net Tover / 1 nd Qua	eal-Time Ilticasting unction – htroduction tworks – Si ATM over <b>Fotal Hour</b> ality and S etwork, W	Transp – VOIP. Router n to br witch an WDM – s: 60 ervice ,	oS sup ort Pro Introdu r interf Hour oadcast rchitect IP over 2nd Ec	port - btocol uction ace - rs: 09 t-and- ures - r ATM dition,
Introduction to Resource Rese (RTP). Multime to the Cisco I Configuration n UNIT – V Introduction to select networks Routing and wa over WDM – IP Total contact H Text Books: 1. William Pearson 2. Todd La 3. Dayana 4. Rajiv Ra Kaufma	Quality of Service - Integrated Serviervation (RSVP) – Multiprotocol Lagedia services – Transmission of multim         OS – Cisco user interface – Router         nanagement.         Optical Networks         Optical networks – Wavelength divistions - Switch architectures - channel accestion over WDM.         Iours: 45       Total Tutorials: 15         Total Tutorials: 15       Total Tutorials: 15         An Stallings, High-Speed Networks and Ir in Education, 2002.         ammle, Sybex, CCNA Intro – Study Guidant Ambawade, Deven shah, Mahendra amaswami and Kumar N. Sivarajan, Optiann (Elsevier Indian Edition), 2004	abel Switching edia over the in and Switch Ad sion multiplexir ssing – Wavelen y design– IP ove otal Practical Cla nternets, perforr de . aMehra, Advanc	(MPLS) ternet – ministra ng (WDI gth rout r SONET nsses: - mance a	) – R - IP mu ative f M) – Ir ted net Tover / 1 nd Qua	eal-Time Ilticasting unction – htroduction tworks – Si ATM over <b>Fotal Hour</b> ality and S etwork, W	Transp – VOIP. Router n to br witch an WDM – s: 60 ervice ,	oS sup ort Pro Introdu r interf Hour oadcast rchitect IP over 2nd Ec	port - btocol uction ace - rs: 09 t-and- ures - r ATM dition,
Introduction to Resource Rese (RTP). Multime to the Cisco II Configuration in UNIT – V Introduction to select networks Routing and wa over WDM – IP Total contact H Text Books: 1. William Pearson 2. Todd La 3. Dayana 4. Rajiv Ra Kaufma	Quality of Service - Integrated Servier Quality of Service - Integrated Servier Quality of Service - Integrated Servier Quality of Service - Multiprotocol Ladedia services - Transmission of multim QS - Cisco user interface - Router nanagement.         Optical services - Transmission of multim QS - Cisco user interface - Router nanagement.         Optical Networks         Optical networks - Wavelength diviers - Switch architectures - channel access avelength assignment - virtual topology over WDM.         Iours: 45       Total Tutorials: 15       Total Tutorials: 15         In Stallings, High-Speed Networks and Ir n Education, 2002.       Total Networks - Study Guidant Ambawade, Deven shah, Mahendra amaswami and Kumar N. Sivarajan, Optical Ambawade, Indian Edition), 2004	abel Switching edia over the in and Switch Ad sion multiplexir ssing – Wavelen y design– IP ove otal Practical Cla nternets, perforr de . aMehra, Advanc tical Networks: <i>i</i>	(MPLS) ternet – ministra ng (WDI gth rout r SONET asses: - mance a ce Comp A Practio	) – R - IP mu ative f M) – Ir ted net Tover / Tover / nd Qua	eal-Time Ilticasting unction – htroduction tworks – Si ATM over <b>Total Hour</b> ality and S etwork, W spective ,	Transp – VOIP. Router n to br witch an WDM – s: 60 ervice , /iley Inc 2nd Edi	oS sup ort Pro Introdu r interf Hour oadcast rchitect IP over 2nd Ec dia, 201 tion, M	port - btocol action ace - rs: 09 t-and- ures - r ATM dition, 1. organ
Introduction to Resource Rese (RTP). Multime to the Cisco I Configuration n UNIT – V Introduction to select networks Routing and wa over WDM – IP Total contact H Text Books: 1. William Pearson 2. Todd La 3. Dayana 4. Rajiv Ra Kaufma Reference Bool	Quality of Service - Integrated Serviervation (RSVP) – Multiprotocol Lagedia services – Transmission of multim         OS – Cisco user interface – Router         nanagement.         Optical Networks         Optical networks – Wavelength divistions - Switch architectures - channel accestion over WDM.         Iours: 45       Total Tutorials: 15         Total Tutorials: 15       Total Tutorials: 15         An Stallings, High-Speed Networks and Ir in Education, 2002.         ammle, Sybex, CCNA Intro – Study Guidant Ambawade, Deven shah, Mahendra amaswami and Kumar N. Sivarajan, Optiann (Elsevier Indian Edition), 2004	abel Switching edia over the in and Switch Ad sion multiplexir ssing – Wavelen y design– IP ove otal Practical Cla nternets, perforr de . aMehra, Advanc tical Networks: <i>i</i>	(MPLS) ternet – ministra ng (WDI gth rout r SONET asses: - mance a ce Comp A Practio	) – R - IP mu ative f M) – Ir ted net Tover / Tover / nd Qua	eal-Time Ilticasting unction – htroduction tworks – Si ATM over <b>Total Hour</b> ality and S etwork, W spective ,	Transp – VOIP. Router n to br witch an WDM – s: 60 ervice , /iley Inc 2nd Edi	oS sup ort Pro Introdu r interf Hour oadcast rchitect IP over 2nd Ec dia, 201 tion, M	port - btocol uction ace – rs: 09 t-and- ures - r ATM lition, 1. organ
Introduction to Resource Reso (RTP). Multime to the Cisco I Configuration n UNIT – V Introduction to select networks Routing and wa over WDM – IP Total contact H Text Books: 1. William Pearson 2. Todd La 3. Dayana 4. Rajiv Ra Kaufma Reference Bool 1. Fred Ha 2001.	Quality of Service - Integrated Servier Quality of Service - Integrated Servier Quality of Service - Integrated Servier Quality of Service - Multiprotocol Ladedia services - Transmission of multim QS - Cisco user interface - Router nanagement.         Optical services - Transmission of multim QS - Cisco user interface - Router nanagement.         Optical Networks         Optical networks - Wavelength diviers - Switch architectures - channel access avelength assignment - virtual topology over WDM.         Iours: 45       Total Tutorials: 15       Total Tutorials: 15         In Stallings, High-Speed Networks and Ir n Education, 2002.       Total Networks - Study Guidant Ambawade, Deven shah, Mahendra amaswami and Kumar N. Sivarajan, Optical Ambawade, Indian Edition), 2004	abel Switching edia over the in and Switch Ad sion multiplexir ssing – Wavelen y design– IP ove otal Practical Cla nternets, perforr de . aMehra, Advanc tical Networks: ,	(MPLS) ternet – ministra ng (WDI gth rout r SONET isses: - mance a ce Comp A Practio	) – R - IP mu ative f M) – Ir ted net Tover / Tover / nd Qua nd Qua outer N cal Per	eal-Time Ilticasting unction – htroduction tworks – Si ATM over Fotal Hour ality and S etwork, W spective , dards, Pea	Transp – VOIP. Router n to br witch ar WDM – s: 60 ervice , /iley Inc 2nd Edi rson Ed	oS sup ort Pro Introdu r interf Hou coadcast rchitect IP over 2nd Ec dia, 201 tion, M	port - btocol action ace - rs: 09 t-and- ures - r ATM lition, lition, 1. organ
Introduction to Resource Rese (RTP). Multime to the Cisco I Configuration n UNIT – V Introduction to select networks Routing and wa over WDM – IP Total contact H Text Books: 1. William Pearson 2. Todd La 3. Dayana 4. Rajiv Ra Kaufma Reference Bool 1. Fred Ha 2001. 2. C.Siva F 2002. 3. Laon-G	Quality of Service - Integrated Servier         Quality of Service - Integrated Servier         ervation (RSVP) - Multiprotocol Lagedia services - Transmission of multim         OS - Cisco user interface - Router         nanagement.         Optical Networks         Optical networks - Wavelength divier         s - Switch architectures - channel access         avelength assignment - virtual topology         over WDM.         Iours: 45       Total Tutorials: 15         Total Tutorials: 15       Total access         and Ambawade, Deven Shah, Mahendra         amaswami and Kumar N. Sivarajan, Optical Networks and Ir         and Ambawade, Deven Shah, Mahendra         amaswami and Kumar N. Sivarajan, Optical Networks         and Multimedia Communications: Appications	abel Switching edia over the in and Switch Ad sion multiplexir ssing – Wavelen y design– IP ove otal Practical Cla nternets, perforr de . aMehra, Advanc tical Networks: / oplications, Proto	(MPLS) ternet – ministra ng (WDI gth rout r SONET nsses: - mance a e Comp A Practio ocols and works: C	) – R - IP mu ative f M) – Ir ted net Tover / Tover / nd Qua outer N cal Per	eal-Time Ilticasting unction – htroduction tworks – S ATM over Fotal Hour ality and S etwork, W spective , dards, Pea ts, Design	Transp – VOIP. Router n to br witch an WDM – <b>s: 60</b> ervice , /iley Inc 2nd Edi rson Ed and Alg	oS sup ort Pro Introdu r interf Doadcast rchitect IP over 2nd Ec dia, 201 tion, M ucation	port - btocol uction ace – rs: 09 t-and- ures - r ATM lition, lition, 1. organ

## Websites:

1. http://gonda.nic.in/swangonda/pdf/ccna1.pdf

-	Computer Science and Engineering		-		ch. (Distrik	outed Sys	stems)	
Semester :	One		egory	:TY				
Subject Code	Subject	-	ours / V	1	Credit	Maxi	r	
CS153	Distributed Database Management Systems	L 3	т 1	Р -	<b>C</b>	<b>CA</b> 40	<b>SE</b> 60	<b>TM</b> 100
Prerequisite	-							
Trerequisite	<ul> <li>Understand the need for the Distribution</li> </ul>	nutod [	)atahas	Suctor	nc			
Objectives	<ul> <li>Knowledge on Distributed Database</li> <li>Need to get the knowledge regardled Management, Parallel Databases et</li> </ul>	e Archi arding tc.,	tecture. differei	nt Data		idigms li	ke Wel	o Data
Outcome	<ul> <li>On successful completion of the course studie</li> <li>Design the applications that include</li> <li>Perform Distributed Query Process</li> <li>Have knowledge on Integrity Contra</li> </ul>	es Distr ing anc	ibuted I	Databas	ses.			
UNIT – I	Introduction of DDBMS						Но	urs: 09
	a Processing – Data Delivery Alternatives – C	hallen	ges of D	DBSs –	Design Issu	ies – Dist		
Cleaning. UNIT – II View Manager	ottom Up Design Methodology – Schema Ma Data and Access Control ment – Data Security – Semantic Integrity oblem – Objectives of Query Processing	/ Cont	rol – C	verviev	v of Quer	y Proces	Ho ssing –	urs: 09 Quer
Characterizatio	n of Query Processors – Layers of Query Pro							
	osition – Localization of Distributed Data.							
UNIT – III	Optimization of Queries and Transaction N ation – Centralized Query Optimization – Joi	-						urs: 09
Processing Arc and Execution Transactions –	Multidatabase Query Processing – Issues in I hitecture – Query Rewriting Using Views – C – Introduction to Transaction Managem Types of Transactions – Architecture Revisite	Query ( ient – d.	Optimiza	ation ar	nd Executio	on – Que	ery Tran Propert	slatio ies o
UNIT – IV	Distributed Concurrency Control & Replica							urs: 0
Algorithms – T Deadlock Mana Measures – Fai with Site Failu Replicated Dat	heory – Taxonomy of Concurrency Contro imestamp based Concurrency Control Algor agement – "Relaxed" Concurrency Control – ilures in Distributed DBMS – Local Reliability res – Network Partitioning – Architectural cabases – Update Management Strategies I Failures – Replication Mediator Service.	rithms Distrib Proto Consi	– Optin uted DE cols – D deratior	nistic C BMS Rel istribut ns – Da	oncurrency iability – R ed Reliabil ita Replica	y Contro Reliability ity Proto ation – (	I Algorit concep cols – [ Consiste	hms - ots and Dealin ncy o
UNIT – V	Database Systems – Various Models						Но	urs: 0
Parallel Databa Database Clust – Object Distri Query Processi - Web Querying	ise System Architectures – Parallel Data Plac ers – Distributed Object Database Managem buted Design – Architectural Issues – Objec ng – Transaction Management - Web Data N g – Distributed XML Processing.	ent – F t Mana	undame agemen	ental Ob t – Dist	ject Conce tributed O	epts and bject Sto	ad Balar Object N orage —	ncing - Model Objec
Total contact H	Iours: 45 Total Tutorials: 15 Total F	Practica	al Classe	es: -	Total Ho	ours: 60		
Text Books:								
	er Ozsu, Patrick Valduriez, Principles of Distr	ibuted	Databa	se Syste	ems , Sprin	ger, 2011	L	
<b>Reference Boo</b>								
2. Stefand 2008	dra Ray, Distributed Database Systems, Pear o Ceri, Giuseppe Pelagatti, Distributed Data					McGraw	Hill Edu	catior
Websites:								
1. http://	databasemanagement.wikia.com/							

- http://docs.oracle.com/
   http://www.odbms.org/

	Computer Science and Engineering	-			h. (Distribut	ea Syst	ems)	
Semester :	One	Cate		: TY				
Subject Code	Subject		ours / W	1	Credit		mum N	1
CS154	Parallel Computing	<b>L</b> 3	<b>T</b>	Р	<b>C</b>	<b>CA</b> 40	<b>SE</b> 60	<b>TM</b> 100
Prerequisite		5	1	-	4	40	00	100
Objectives	<ul> <li>To understand the architecture of in present day's processors.</li> <li>To understand the various parallel parallel programming and learn the MPI</li> <li>To study the complexity behind par</li> </ul>	progra e paral	amming Iel prog	models rammin	s and the cl	hallenge	es invo	lved in
Outcome	<ul> <li>At the end of the course the students will be</li> <li>Acquire the skills to implement sof platforms</li> <li>Have a keen knowledge in multithree</li> </ul>	ftware	effectiv		efficiently			<sup>-</sup> dware
UNIT – I	Introduction					Hou	rs: 09	
algorithms. UNIT – II Parallel Progra performance – interconnection characteristics	he need for parallel computers - models Parallel Algorithm Design and Communicate amming Platforms: Trends in microproces parallel computing platforms – communication n networks. Principles of Parallel Algorithm of tasks and interactions – mapping technologies parallel algorithm models. Basic Com	tion Op sor ard on cost Desigr niques	eration chitectu s in para r: Prelir for loa	<b>s</b> Ires - I allel ma ninaries d balan	limitations chines – rou – decomp ncing – me	Hour of men uting me osition thods f	rs: 09 mory s echanis technio or con	system sms for ques – taining
to-one reductio	on – all-to-all broadcast reduction – all-reduce	e and p	orefix-su	im oper	ations – sca	itter and	d gathe	er – all
-	zed communication – circular shift – improvin	ng the s	peed of	some c	ommunicat			<u>.</u>
UNIT – III	Parallel Programming Models						rs: 09	
parallel system time. Program building blocks communication communicators Pthreads – cor	leling of Parallel Programs: Sources of overl s – scalability of parallel systems – minimum ming using the Message-Passing Paradigm – MPI – topologies and embedding – overlap n with computation – collective communi s. Programming Shared Address Space Platt ntrolling thread and synchronization attribut chronous programs – OpenMP.	n execut : princ ping ication forms:	tion tim iples of and co Thread	e and n messa omputa basics	ninimum co ge-passing tion opera – synchror	ost-optir prograi tions – iization	nal exe mming group primit	ecutior – the os and ives ir
UNIT – IV	Parallel Algorithms					Hou	rs: 09	
Dense Matrix A equations – FF Quicksort – bud	Algorithms: Matrix-vector multiplication – ma I. Sorting: Issues in sorting on parallel compu- cket and sample sort – other sorting algorithm ning tree – single-source shortest paths – all-	ters – s ns. Gra	orting r ph Algo	network rithms:	s – bubble s	ng a sys sort and	tem of its var	iants –
UNIT – V	Parallel Algorithms					Hou	rs: 09	
Search Algorith algorithms, sea parallel search Formulation-Se	mms for Discrete for Discrete Optimization P arch overhead factor, parallel depth-first sea algorithms. Dynamic Programming: Seria rial Polyadic DP Formulations-Non serial Pol Binary Exchange algorithm-The Transpose alg	arch, p I Mona Iyadic I gorithm	arallel I adic DF DP Forn	Dest-firs Formunulation	t search, spulation-Non	es, sequ beedup serial ier Trar	iential anoma Monae	alies ir dic DF
Text Books:			2.2.000					
1. Ananth Pearso	Grama, Anshul gupta, George Karypis and V n Education, Second edition, 2004.							outing
2. V. Raja	raman and C. Siva Ram Murthy, Parallel Co	mputer	rs – Arc	nitectur	e and Pro	grammi	ng, Pr	entice

Hall of India, 2003.

### **Reference Books:**

- 1. Selim G. Akl, The Design and Analysis of Parallel Algorithms, Prentice-Hall of India, 1999.
- 2. M.J. Quinn, Parallel Computing Theory and Practice , McGraw-Hill, 1994.
- 3. Michael Jay Quinn, Parallel Programming in C with MPI and OpenMP McGraw-Hill, 2003

### Websites:

- 1. http://www.openmp.org
- 2. http://www.nptel.ac.in
- 3. http://www/aparallel.com

Subject         Hours / Week         Credit         Maximum Marks           CS155         Advance Software Laboratory I         -         3         2         60         40         100           Prerequisite         -         -         3         2         60         40         100           Objectives         To impart basic working knowledge on distributed system concepts.         -         3         2         60         40         100           Objectives         To impart basic working knowledge on distributed system concepts.         -         3         2         60         40         100           Objectives         To impart basic working knowledge on distributed architecture environment.         -         -         3         2         60         40         100           Outcome         -         After doing the lab students are able to understand the distributed systems concepts.         -         Able to implement time, event relationships and understand the concepts of distributed deadlocks and mutual exclusion.         -         To gain in depth understanding of distributed architecture environment.           CYCLE - 1         Any experiments from the chosen elective course may be included.         Hours: 21         1         Inter-process communication         Ising algorithms.         6         Clock synchronization:         NF <th>Department : C</th> <th>Computer Scier</th> <th>nce and Eng</th> <th>gineering</th> <th>Program</th> <th>mme : N</th> <th>1.Tech.</th> <th>(Distrib</th> <th>uted Syste</th> <th>ms)</th> <th></th>	Department : C	Computer Scier	nce and Eng	gineering	Program	mme : N	1.Tech.	(Distrib	uted Syste	ms)	
Subject         L         T         P         C         CA         SE         TM           CS155         Advance Software Laboratory I         -         -         3         2         60         40         100           Prerequisite         -         -         3         2         60         40         100           Prerequisite         -         -         -         3         2         60         40         100           Prerequisite         -         -         -         3         2         60         40         100           Prerequisite         -         -         -         3         2         60         40         100           Polipectives         -         To impart basic working knowledge on distributed architecture environment.         -	Semester : (	Dne			Catego	r <b>y :</b> Ll	В				
Control         L         T         P         C         CA         SE         TM           CS155         Advance Software Laboratory I         -         -         3         2         60         40         100           Prerequisite         -         -         3         2         60         40         100           Objectives         To impart basic working knowledge on distributed system concepts.         -         60         40         100           Dutcome         -         After doing the lab students are able to understand the distributed systems concepts.         -         After doing the lab students are able to understand the concepts of distributed aedlocks and mutual exclusion.         -         To gain in depth understanding of distributed architecture environment.           CYCLE - I         Any experiments from the chosen elective course may be included.         Hours: 21           1.         Inter-process communication using socket programming/ RPC mechanism .         -	Cubicat Code	Cubicat			Hours /	Week		Credit	Maxim	num Ma	rks
Prerequisite       -         Objectives       • To impart basic working knowledge on distributed system concepts.         • To understand the intricacies of distributed architecture environment.         • After doing the lab students are able to understand the distributed systems concepts.         • Able to implement time, event relationships and understand the concepts of distribute deadlocks and mutual exclusion.         • To gain in depth understanding of distributed architecture environment.         CYCLE - I       Any experiments from the chosen elective course may be included.         • Alter of election algorithms (Ring and Bus Topology)       4. a.Bully b.Ring         • Distributed/Hierarchical deadlock detection algorithms.       6. Clock synchronization: NTP / Lamports clock.         CYCLE - II       Any experiments from the chosen elective course may be included.         Hours: 24       1. Load distributing algorithms, Performance comparison.         6. Clock synchronization: NTP / Lamports clock.       Hours: 24         11. Load distributing algorithms, Performance comparison.       2. Error recovery in concurrent systems         3. Design and implement client server application using RMI (Remote Method invocation)       4. Design and implement an application using SIB (Entity Java Beans) session bean business logic and service using stub, i.e., client side proxy object.         5. Design and implement an offline database communication system using JMS (Java Message Service) to service the client request.	Subject Code	Subject			L	Т	Р	С	CA	SE	ТМ
Dbjectives       • To impart basic working knowledge on distributed system concepts.         • To understand the intricacies of distributed architecture environment.         • After doing the lab students are able to understand the distributed systems concepts.         • Able to implement time, event relationships and understand the concepts of distributed deadlocks and mutual exclusion.         • To gain in depth understanding of distributed architecture environment.         CYCLE - I       Any experiments from the chosen elective course may be included.         1. Inter-process communication using socket programming/ RPC mechanism .       2. Threads clock synchronization.         3. Simulation of election algorithms (Ring and Bus Topology)       4. a.Bully b.Ring         5. Distributed/Hierarchical deadlock detection algorithms.       6. Clock synchronization: NTP / Lamports clock.         CYCLE - II       Any experiments from the chosen elective course may be included.       Hours: 24         1. Load distributing algorithms, Performance comparison.       2. Error recovery in concurrent systems       3. Design and implement client server application using RMI (Remote Method Invocation)         4. Design and implement an application using EJB (Entity Java Beans) session bean business logic and service using stub, i.e., client side proxy object.       5. Design and implement an offline database communication system using JMS (Java Message Service) to service the client request.       6. Develop a simple task manage application that keeps track of tasks execution maintaining which tasks have been execute	CS155	Advance Sof	ftware Lab	oratory I	-	-	3	2	60	40	100
Dispectives       • To understand the intricacies of distributed architecture environment.         • After doing the lab students are able to understand the distributed systems concepts.         • Able to implement time, event relationships and understand the concepts of distribute deadlocks and mutual exclusion.         • To gain in depth understanding of distributed architecture environment.         CYCLE - I       Any experiments from the chosen elective course may be included.       Hours: 21         1. Inter-process communication using socket programming/ RPC mechanism .       2. Threads clock synchronization.       Hours: 21         2. Threads clock synchronization.       3. Simulation of election algorithms (Ring and Bus Topology)       4. a.Bully b.Ring         5. Distributed/Hierarchical deadlock detection algorithms.       6. Clock synchronization: NTP / Lamports clock.       Hours: 24         1. Load distributing algorithms, Performance comparison.       2. Error recovery in concurrent systems       B. Design and implement an application using RMI (Remote Method Invocation)       4. Design and implement an application using EJB (Entity Java Beans) session bean business logic and service using stub, i.e., client side proxy object.       5. Design and implement an offline database communication system using JMS (Java Message Service) to service the client request.       6. Develop a simple task manage application that keeps track of tasks execution maintaining which tasks have been executed in eclipse JAVA environment using XML and JAVA servlets/JSP	Prerequisite	-				·					
• Able to implement time, event relationships and understand the concepts of distributed deadlocks and mutual exclusion.       • To gain in depth understanding of distributed architecture environment.         CYCLE - I       Any experiments from the chosen elective course may be included.       Hours: 21         1.       Inter-process communication using socket programming/ RPC mechanism.       PC         2.       Threads clock synchronization.       3. Simulation of election algorithms (Ring and Bus Topology)         4.       a.Bully b.Ring       5. Distributed/Hierarchical deadlock detection algorithms.         6.       Clock synchronization: NTP / Lamports clock.       Hours: 24         1.       Load distributing algorithms, Performance comparison.       Error recovery in concurrent systems         3.       Design and implement client server application using RMI (Remote Method Invocation)       4. Design and implement an application using EJB (Entity Java Beans) session bean business logic and service using stub, i.e., client side proxy object.         5.       Design and implement an offline database communication system using JMS (Java Message Service) to service the client request.         6.       Develop a simple task manage application that keeps track of tasks execution maintaining which tasks have been executed in eclipse JAVA environment using XML and JAVA servlets/JSP	Objectives		•	-	-				•		
1.       Inter-process communication using socket programming/ RPC mechanism.         2.       Threads clock synchronization.         3.       Simulation of election algorithms (Ring and Bus Topology)         4.       a.Bully b.Ring         5.       Distributed/Hierarchical deadlock detection algorithms.         6.       Clock synchronization: NTP / Lamports clock.         CYCLE - II       Any experiments from the chosen elective course may be included.         Hours: 24       1.         Load distributing algorithms, Performance comparison.         2.       Error recovery in concurrent systems         3.       Design and implement client server application using RMI (Remote Method Invocation)         4.       Design and implement an application using EJB (Entity Java Beans) session bean business logic and service using stub, i.e., client side proxy object.         5.       Design and implement an offline database communication system using JMS (Java Message Service) to service the client request.         6.       Develop a simple task manage application that keeps track of tasks execution maintaining which tasks have been executed in eclipse JAVA environment using XML and JAVA servlets/JSP	Outcome	• Able dead	<ul> <li>Able to implement time, event relationships and understand the concepts of di deadlocks and mutual exclusion.</li> </ul>								-
mechanism .         2. Threads clock synchronization.         3. Simulation of election algorithms (Ring and Bus Topology)         4. a.Bully b.Ring         5. Distributed/Hierarchical deadlock detection algorithms.         6. Clock synchronization: NTP / Lamports clock.         CYCLE - II         Any experiments from the chosen elective course may be included.         Hours: 24         1. Load distributing algorithms, Performance comparison.         2. Error recovery in concurrent systems         3. Design and implement client server application using RMI (Remote Method Invocation)         4. Design and implement an application using EJB (Entity Java Beans) session bean business logic and service using stub, i.e., client side proxy object.         5. Design and implement an offline database communication system using JMS (Java Message Service) to service the client request.         6. Develop a simple task manage application that keeps track of tasks execution maintaining which tasks have been executed in eclipse JAVA environment using XML and JAVA servlets/JSP	CYCLE - I	Any exp	eriments f	rom the choser	n elective co	urse ma	ay be ir	ncluded.		Hours	: 21
<ol> <li>Load distributing algorithms, Performance comparison.</li> <li>Error recovery in concurrent systems</li> <li>Design and implement client server application using RMI (Remote Method Invocation)</li> <li>Design and implement an application using EJB (Entity Java Beans) session bean business logic and service using stub, i.e., client side proxy object.</li> <li>Design and implement an offline database communication system using JMS (Java Message Service) to service the client request.</li> <li>Develop a simple task manage application that keeps track of tasks execution maintaining which tasks have been executed in eclipse JAVA environment using XML and JAVA servlets/JSP</li> </ol>		<ul> <li>mechanism .</li> <li>2. Threads clock synchronization.</li> <li>3. Simulation of election algorithms (Ring and Bus Topology)</li> <li>4. a.Bully b.Ring</li> <li>5. Distributed/Hierarchical deadlock detection algorithms.</li> </ul>									
<ol> <li>Error recovery in concurrent systems</li> <li>Design and implement client server application using RMI (Remote Method Invocation)</li> <li>Design and implement an application using EJB (Entity Java Beans) session bean business logic and service using stub, i.e., client side proxy object.</li> <li>Design and implement an offline database communication system using JMS (Java Message Service) to service the client request.</li> <li>Develop a simple task manage application that keeps track of tasks execution maintaining which tasks have been executed in eclipse JAVA environment using XML and JAVA servlets/JSP</li> </ol>	CYCLE - II							cluded.		Hours	: 24
		<ol> <li>Load distributing algorithms, Performance comparison.</li> <li>Error recovery in concurrent systems</li> <li>Design and implement client server application using RMI (Remote Method Invocation)</li> <li>Design and implement an application using EJB (Entity Java Beans) session bean business logic and service using stub, i.e., client side proxy object.</li> <li>Design and implement an offline database communication system using JMS (Java Message Service) to service the client request.</li> <li>Develop a simple task manage application that keeps track of tasks execution maintaining which tasks have been executed in eclipse JAVA</li> </ol>									
				-						4-1 U.S	

Somostor - 7	Било.					(		.Tech. (Distributed Systems) {					
Semester : 7	[wo		Cate		: TY			• • • • •					
Subject Code	Course Nan	ne	HO	urs / W	еек Р	Credit C	CA	ximum I SE	viarks TM				
CS156	Cloud Com	nuting	3	1	- r	4	40	60	100				
Prerequisite	-		<u> </u>	-			10		100				
	• To i	ntroduce the basics o	f Cloud Computi	ing									
		educate the cloud wor		<u>8</u> .									
Objectives		Allow computer system	-	aucod	in an o	fficiont m	nnor						
		kes the environment t		e useu	iii ali e		anner.						
		ful completion of the c		will bo	abla ta	<b>.</b> .							
Outcomo		derstand the concepts					niquoc						
Outcome		•	•	-	unsie		inques.						
UNIT – I	• Pro	vide a pleasant and ef	rective user inte	riace									
		uting The Evolution	of Cloud Comm		Lloudu				lours: 0				
		uting- The Evolution	•	-									
		zation - Web Servic											
Cloud Network		- Monitoring-as-aServ	ice – Platform-	as-a-Se	rvice -	- Software	e-as-a-se	ervice –	Buildin				
									10				
UNIT – II			Duit of a stand its	Delette			-		Hours:0				
		esence in the Cloud -	•						ystems -				
-	Lioua - Comm	on Standards in the C	ioua – Ena-User	Access	to the	Cloud Cor	nputing						
UNIT – III									lours: 0				
Continuum of L	Jtilities- Stand	wards a Utility Model dards and Working Gro	oups - Standards	s Bodie	s and <b>\</b>	Working G	roups –	re Applio Service	cations Oriente				
Continuum of U Architecture – Utility Computi Based Automa	Jtilities-Stand Business Prod ng Technolog tion – Applic	dards and Working Gro cess Execution Langua y – Virtualization – Hy ation Management –	oups - Standards ge – Interopera per Threading – Evaluating Utili	s Bodie bility S Blade ty Mar	s and N tandar Server nagem	Working G ds for Dat s - Automa ent Techn	roups – a Cente ated Pro ology -	re Applie Service r Manage visioning	cations Oriente gement g - Polic				
Continuum of U Architecture – Utility Computi Based Automa development E	Jtilities-Stand Business Prod ng Technolog tion – Applic	dards and Working Gro cess Execution Langua y – Virtualization – Hy	oups - Standards ge – Interopera per Threading – Evaluating Utili	s Bodie bility S Blade ty Mar	s and N tandar Server nagem	Working G ds for Dat s - Automa ent Techn	roups – a Cente ated Pro ology -	re Applic Service r Manag visionin Virtual	cations - Orienteo gement g - Polic Test and				
Continuum of U Architecture – Utility Computi Based Automa development E <b>UNIT – IV</b>	Jtilities- Stand Business Proo ng Technolog tion – Applic nvironment -	dards and Working Gro cess Execution Langua y – Virtualization – Hy ation Management – Data Center Challenge	oups - Standards ge – Interopera per Threading – Evaluating Utili es and Solutions	s Bodie bility S Blade ty Mar - Autor	s and N tandar Server nagem nating	Working G ds for Dat s - Automa ent Techn the Data G	roups – a Cente ated Pro ology - Center	re Applic Service r Manag visionin Virtual	cations - Oriente gement g - Polic Test and <b>Iours: 0</b>				
Continuum of U Architecture – Utility Computi Based Automa development E <b>UNIT – IV</b> Software Utility Value - Softwa	Jtilities- Stand Business Pro- ng Technolog tion – Applic nvironment - / Application re Applicatio	dards and Working Gro cess Execution Langua y – Virtualization – Hy ation Management – Data Center Challenge Architecture - Charact n Services Framework	oups - Standards ge – Interopera per Threading – Evaluating Utili es and Solutions teristics of an Sa s - Common En	s Bodie bility S Blade ty Mar - Autor aaS - So ablers	s and N tandar Server nagement mating	Working G ds for Dat s - Automa ent Techn the Data C e Utility A	roups – ca Cente ated Pro ology - Center pplicatio	re Applic Service r Manag visionin Virtual <b>h</b> ons - Cos	cations Oriente gement g - Polic Test an <b>Iours: 0</b> st Versu				
Continuum of U Architecture – Utility Computi Based Automa development E <b>UNIT – IV</b> Software Utility Value - Softwa Profits - Implen	Jtilities- Stand Business Pro- ng Technolog tion – Applic nvironment - / Application re Applicatio	dards and Working Gro cess Execution Langua y – Virtualization – Hy ation Management – Data Center Challenge Architecture - Charact	oups - Standards ge – Interopera per Threading – Evaluating Utili es and Solutions teristics of an Sa s - Common En	s Bodie bility S Blade ty Mar - Autor aaS - So ablers	s and N tandar Server nagement mating	Working G ds for Dat s - Automa ent Techn the Data C e Utility A	roups – ca Cente ated Pro ology - Center pplicatio	re Applic Service r Manag visionin Virtual <b>h</b> ons - Cos eality –	cations - Oriente gement g - Polic Test and Iours: O st Versu Busines				
Continuum of U Architecture – Utility Computi Based Automa development E UNIT – IV Software Utility Value - Softwa Profits - Implen UNIT – V	Jtilities- Stand Business Pro- ng Technolog tion – Applic nvironment - / Application re Application nenting Datak	dards and Working Gro cess Execution Langua y – Virtualization – Hy ation Management – Data Center Challenge Architecture - Characc n Services Framework base Systems for Multi	oups - Standards ge – Interopera per Threading – Evaluating Utili es and Solutions teristics of an Sa c - Common En tenant Architect	s Bodie bility S Blade ty Mar - Autor aaS - So ablers ure	s and V tandar Server nagem nating oftware – Conc	Working G ds for Dat s - Automa ent Techn the Data G e Utility A ceptual vie	roups – a Cente ated Pro ology - Center pplicatio	re Applic Service r Manag visionin Virtual <b>h</b> ons - Cos eality –	cations - Oriente gement g - Polic Test and <b>lours: 0</b> Busines				
Continuum of U Architecture – Utility Computi Based Automa development E <b>UNIT – IV</b> Software Utility Value - Softwa Profits - Implen <b>UNIT – V</b> Other Design	Jtilities- Stand Business Pro- ng Technolog tion – Applic nvironment - / Application re Application nenting Datab	dards and Working Gro cess Execution Langua y – Virtualization – Hy ation Management – Data Center Challenge Architecture - Charact n Services Framework base Systems for Multi- ns - Design of a V	oups - Standards ge – Interopera per Threading – Evaluating Utili es and Solutions teristics of an Sa c - Common En- tenant Architect	s Bodie bility S Blade ty Mar - Autor aaS - So ablers ure Meteri	s and V tandar Server nagem mating oftware – Conce ng Int	Working G ds for Dat s - Automa ent Techn the Data C e Utility A e Utility A eptual vie erface -	roups – a Cente ated Pro ology - <u>Center</u> pplicatic ew to Ro Applica	re Applic Service or Manage ovisioning Virtual <b>H</b> ons - Cos eality – <b>H</b> tion Mo	cations - Oriente gement g - Polic Test and Iours: 0 St Versu Busines				
Continuum of U Architecture – Utility Computi Based Automa development E <b>UNIT – IV</b> Software Utility Value - Softwa Profits - Implen <b>UNIT – V</b> Other Design Implementation	Jtilities- Stand Business Pro- ng Technolog tion – Applic nvironment - Application re Application nenting Datak Consideration n - A Design	dards and Working Gro cess Execution Langua y – Virtualization – Hy ation Management – Data Center Challenge Architecture - Charact n Services Framework base Systems for Multi- ns - Design of a M for an Update and	oups - Standards ge – Interopera per Threading – Evaluating Utili es and Solutions teristics of an Sa c - Common En- tenant Architect Web Services Notification Pol	s Bodie bility S Blade ty Mar - Autor aaS - So ablers ure Meteri icy - T	s and V tandar Server nagem mating oftward – Cond ng Int ransfo	Working G ds for Dat s - Automa ent Techn the Data C e Utility A e Utility A e trility A erface - rming to	roups – a Cente ated Pro ology - Center pplicatic ew to R Applica Softwar	re Applic Service ovisionin Virtual Pons - Cos eality – tion Mo e as a S	cations - Oriented gement g - Polic Test and Iours: 0 Busines Iours: 0 Service				
Continuum of U Architecture – Utility Computi Based Automa development E <b>UNIT – IV</b> Software Utility Value - Softwa Profits - Implen <b>UNIT – V</b> Other Design Implementation	Jtilities- Stand Business Pro- ng Technolog tion – Applic nvironment - / Application re Application nenting Datak Consideration n - A Design nsformation I	dards and Working Gro cess Execution Langua y – Virtualization – Hy ation Management – Data Center Challenge Architecture - Charact n Services Framework base Systems for Multi- ns - Design of a V	oups - Standards ge – Interopera per Threading – Evaluating Utili es and Solutions teristics of an Sa c - Common En- tenant Architect Web Services Notification Pol	s Bodie bility S Blade ty Mar - Autor aaS - So ablers ure Meteri icy - T Virtual	s and V tandar Server nagem nating oftward – Cond ng Int ransfo Service	Working G ds for Dat s - Automa ent Techn the Data G e Utility A e Utility A eptual vie erface - rming to es for Orga	roups – a Cente ated Pro ology - Center pplicatic ew to R Applica Softwar	re Applic Service r Manage visionin Virtual Uirtual <b>h</b> ons - Cos eality – <b>h</b> tion Mo e as a S s - The F	cations Oriente gement g - Polic Test an <b>Iours: 0</b> St Versu Busines <b>Iours: 0</b> Onitorin Service				
Continuum of U Architecture – Utility Computi Based Automa development E <b>UNIT – IV</b> Software Utility Value - Softwa Profits - Implen <b>UNIT – V</b> Other Design Implementation Application Tra	Jtilities- Stand Business Pro- ng Technolog tion – Applic nvironment - / Application re Application nenting Datak Consideration n - A Design nsformation I	dards and Working Gro cess Execution Langua y – Virtualization – Hy ation Management – Data Center Challenge Architecture - Characc n Services Framework base Systems for Multi- ns - Design of a M for an Update and Program - Business Mo	oups - Standards oups - Interopera per Threading – Evaluating Utili es and Solutions teristics of an Sa c - Common En tenant Architect Web Services Notification Pol odel Scenarios -	s Bodie bility S Blade ty Mar - Autor aaS - So ablers ure Meteri icy - T Virtual	s and V tandar Server nagem nating oftward – Cond ng Int ransfo Service	Working G ds for Dat s - Automa ent Techn the Data G e Utility A e Utility A eptual vie erface - rming to es for Orga	roups – a Cente ated Pro ology - Center pplication w to Re Applica Softwar nization	re Applic Service r Manage visionin Virtual Uirtual <b>h</b> ons - Cos eality – <b>h</b> tion Mo e as a S s - The F	cations Oriente gement g - Polic Test an Iours: 0 St Versu Busines Iours: 0 Donitorin Service				
Continuum of U Architecture – Utility Computi Based Automa development E <b>UNIT – IV</b> Software Utility Value - Softwa Profits - Implen <b>UNIT – V</b> Other Design Implementation Application Tra <b>Total contact H</b>	Jtilities- Stand Business Pro- ng Technolog tion – Applic nvironment - / Application re Application nenting Datab Consideration n - A Design nsformation I lours: 45	dards and Working Gro cess Execution Langua y – Virtualization – Hy ation Management – Data Center Challenge Architecture - Characc n Services Framework base Systems for Multi- ns - Design of a M for an Update and Program - Business Mo	oups - Standards ge – Interopera per Threading – Evaluating Utili es and Solutions teristics of an Sa teristics of an Sa tenant Architect Web Services Notification Pol odel Scenarios - Y Total Practic	s Bodie bility S Blade ty Mar - Autor aaS - So ablers ure Meteri icy - T Virtual <b>al Class</b>	s and V tandar Server nagem mating oftward - Cond ng Int ransfo Service ses: -	Working G ds for Dat s - Automa ent Techn the Data C e Utility A e O Tota	roups – a Cente ated Pro ology - Center pplication pplication Applica Softwar nization	re Applic Service r Manag visionin Virtual <b>H</b> ons - Cos eality – <b>H</b> tion Mc e as a S s - The F <b>: 60</b>	cations Oriente gement g - Polic Test an Iours: 0 St Versu Busines Iours: 0 Donitorin Service				
Continuum of U Architecture – Utility Computi Based Automa development E <b>UNIT – IV</b> Software Utility Value - Softwa Profits - Implen <b>UNIT – V</b> Other Design Implementation Application Tra <b>Total contact H</b> <b>Text Books:</b> 1. Guy Bu <b>Reference Boo</b>	Jtilities- Stand Business Pro- ng Technolog tion – Applic nvironment - / Application re Application re Application nenting Datab Consideration n - A Design nsformation I lours: 45	dards and Working Gro cess Execution Langua y – Virtualization – Hy ation Management – Data Center Challenge Architecture - Characc n Services Framework base Systems for Multi ns - Design of a V for an Update and Program - Business Mo <b>Total Tutorials: 15</b>	oups - Standards ge – Interopera per Threading – Evaluating Utili es and Solutions teristics of an Sa c - Common En- tenant Architect Web Services Notification Pol odel Scenarios - V Total Practic ng Utility Comp	Bodie bility S Blade ty Mar - Autor aaS - So ablers aure Meteri icy - T Virtual al Class uting , J	s and V tandar Server nagement mating oftware - Conce - Conce - Conce - Conce - Service - Service - Service - Service - Service - Service	Vorking G ds for Dat s - Automa ent Techn the Data G e Utility A e O e Utility A e O e O e O e O e O e O e O e O e O e O	roups – a Cente ated Pro ology - Center pplication pplication a Applica Softwar nization al Hours s Ltd, 20	re Applic Service r Manage visionin Virtual Uirtual bons - Cos eality – <u>H</u> tion Mo e as a S s - The F <b>: 60</b>	cations Oriente gement g - Polic Test an <b>Iours: 0</b> St Versu Busines <b>Iours: 0</b> Onitorin Service uture.				
Continuum of U Architecture – Utility Computi Based Automa development E UNIT – IV Software Utility Value - Softwa Profits - Implem UNIT – V Other Design Implementation Application Tra Total contact H Text Books: 1. Guy Bu Reference Boo 1. John W , CRC P	Jtilities- Stand Business Pro- ng Technolog tion – Applic nvironment - / Application re Application nenting Datak Consideration n- A Design nsformation I ours: 45 nker and Dark ks: / Rittinghouse ress, Taylor &	dards and Working Gro cess Execution Langua y – Virtualization – Hy ation Management – Data Center Challenge Architecture - Charact n Services Framework base Systems for Multi ns - Design of a M for an Update and Program - Business Mo <b>Total Tutorials: 15</b>	oups - Standards age – Interopera per Threading – Evaluating Utili es and Solutions teristics of an Sa teristics of an Sa tenant Architect Web Services Notification Pol odel Scenarios - V Total Practic ng Utility Compu- e, Cloud Compu- Saton London Ne	Bodie bility S Blade ty Mar - Autor aaS - So ablers ure Meteri icy - T virtual al Class uting Im ew York	s and V tandar Server nagem nating oftward - Cond ing Int ransfo Service ses: -	Working G ds for Dat s - Automa ent Techn the Data C e Utility A e Otto s for Orga s for Orga s for Orga diley & Son ntation, M	roups – ra Cente ated Pro ology - Center pplicatic ew to R Applica Softwar nization al Hours s Ltd, 20 lanagem	re Applic Service r Manage wisionin Virtual <b>h</b> ons - Cos eality – <b>h</b> tion Me e as a S s - The F <b>: 60</b>	cations Oriente gement g - Polic Test an <b>Iours: 0</b> St Versu Busines <b>Iours: 0</b> Donitorin Service Juture.				
Continuum of U Architecture – Utility Computi Based Automar development E UNIT – IV Software Utility Value - Softwa Profits - Implen UNIT – V Other Design Implementation Application Tra Total contact H Text Books: 1. Guy Bu Reference Bool 1. John W , CRC P 2. Alfredo	Jtilities- Stand Business Pro- ng Technolog tion – Applic nvironment - / Application re Application nenting Datak Consideration n- A Design nsformation I ours: 45 nker and Dark ks: / Rittinghouse ress, Taylor &	dards and Working Gro cess Execution Langua y – Virtualization – Hy ation Management – Data Center Challenge Architecture - Charact n Services Framework base Systems for Multi- ns - Design of a M for an Update and Program - Business Mo <b>Total Tutorials: 15</b> ren Thomson, Deliveri e and ames F. Ransom Francis Group, Boca R	oups - Standards age – Interopera per Threading – Evaluating Utili es and Solutions teristics of an Sa teristics of an Sa tenant Architect Web Services Notification Pol odel Scenarios - V Total Practic ng Utility Compu- e, Cloud Compu- Saton London Ne	Bodie bility S Blade ty Mar - Autor aaS - So ablers ure Meteri icy - T virtual al Class uting Im ew York	s and V tandar Server nagem nating oftward - Cond ing Int ransfo Service ses: -	Working G ds for Dat s - Automa ent Techn the Data C e Utility A e Otto s for Orga s for Orga s for Orga diley & Son ntation, M	roups – ra Cente ated Pro ology - Center pplicatic ew to R Applica Softwar nization al Hours s Ltd, 20 lanagem	re Applic Service r Manage wisionin Virtual <b>h</b> ons - Cos eality – <b>h</b> tion Me e as a S s - The F <b>: 60</b>	cations Oriente gement g - Polic Test an <b>Iours: 0</b> St Versu Busines <b>Iours: 0</b> Donitorin Service Juture.				
Continuum of U Architecture – Utility Computi Based Automa development E UNIT – IV Software Utility Value - Softwa Profits - Implen UNIT – V Other Design Implementation Application Tra Total contact H Text Books: 1. Guy Bu Reference Boo 1. John W , CRC P	Jtilities- Stand Business Pro- ng Technolog tion – Applic nvironment - / Application re Application nenting Datak Consideration n- A Design nsformation I ours: 45 nker and Dark ks: / Rittinghouse ress, Taylor &	dards and Working Gro cess Execution Langua y – Virtualization – Hy ation Management – Data Center Challenge Architecture - Charact n Services Framework base Systems for Multi- ns - Design of a M for an Update and Program - Business Mo <b>Total Tutorials: 15</b> ren Thomson, Deliveri e and ames F. Ransom Francis Group, Boca R	oups - Standards age – Interopera per Threading – Evaluating Utili es and Solutions teristics of an Sa teristics of an Sa tenant Architect Web Services Notification Pol odel Scenarios - V Total Practic ng Utility Compu- e, Cloud Compu- Saton London Ne	Bodie bility S Blade ty Mar - Autor aaS - So ablers ure Meteri icy - T virtual al Class uting Im ew York	s and V tandar Server nagem nating oftward - Cond ing Int ransfo Service ses: -	Working G ds for Dat s - Automa ent Techn the Data C e Utility A e Otto s for Orga s for Orga s for Orga diley & Son ntation, M	roups – ra Cente ated Pro ology - Center pplicatic ew to R Applica Softwar nization al Hours s Ltd, 20 lanagem	re Applic Service r Manage wisionin Virtual <b>h</b> ons - Cos eality – <b>h</b> tion Me e as a S s - The F <b>: 60</b>	cations Oriente gement g - Polic Test an <b>Iours: 0</b> St Versu Busines <b>Iours: 0</b> Donitorin Service Juture.				

Department : Computer Science and Engineering         Programme : M.Tech. (Distributed Systems)										
Semester : 1	Гмо	Category	: TC	M						
Subject Code	Subject	Hours	s / Wee	k	Credit	Max	imum N	larks		
Subject Code	Subject	L	Т	Ρ	С	CA	SE	ТМ		
CS157	Service Oriented Architecture and Web	3	_	2	4	50	50	100		
	Services	5		2	-	50	50	100		
Prerequisite	-									
	<ul> <li>To gain understanding of the basic p</li> </ul>	•								
Objectives	To learn advanced concepts such a	is service d	iscover	ry, ser	vice comp	ositio	n and se	ervice		
	oriented analysis techniques.									
	To practice web service development		-		E and .NE	l envir	onment	•		
	On successful completion of the course, stud									
	<ul> <li>Apply Service Oriented Design pri dovelopment</li> </ul>	ncipies and	a techr	niques	tor E-Cor	nmerc	e applio	ation		
Outcome	<ul><li>development.</li><li>Experience advanced web service st</li></ul>	andards an		availat	olo in 12EE	and N	ET platf	orm		
	<ul> <li>Apply recent programming tech</li> </ul>						•			
	Application Development	iniques su	cii as	Ajax,	13010 and	JQue		VVED		
UNIT – I							Ноц	rs: 09		
	Evolution and differences with Distributed	computing	. XMI	– Nar	nespace	I XML-R				
	of Web Services - WSDL, SOAP, UDD, SOAP				• •					
Discovery and (				,						
UNIT – II							Hou	rs: 09		
Introduction to	Service Oriented Architecture, Roots of SOA	A – Charact	eristics	of SO	A - Comp	aring S	OA to c	lient-		
server and distr	ributed internet architectures – Anatomy of S	OA- How c	ompon	ents in	an SOA ir	nterrela	ate Prin	ciples		
of Service Orier	ntation									
UNIT – III							Hou	rs: 09		
	Veb Services Development, Web services -						mpone	nts &		
Containers,	Java API for		L-based		web			rvices		
	API for XML based RPC (JAX-RPC), ASP.Net	Web Serv	ice , SO	DA sup	port in .N	NET an	d J2EE,	MVC		
Architecture, S	truts.									
UNIT – IV Web service	 es – Service descriptions – M	laccaging	with	SO		essage		rs: 09		
	es – Service descriptions – M Coordination –Atomic Transactions – B	lessaging				0		nange		
	(WS-CDL) - Service layer abstraction					•		siness		
	Orchestration Service Layer.		pheat	5		uyer	Du	5111035		
UNIT – V							Hou	rs: 09		
	ise Study - Web Service Search Engine, Web Se	ervice Disco	overy u	sing U[	DDI, Web S	Service				
	ing BPEL, Developing an Service oriented E-Co			-				х.		
MINI PROJECT							Hou	rs: 30		
	are to be made of batches of two or three									
	oject in the realm of cloud computing. At the	end of the	project	each	team shou	ld pre	pare a r	eport		
	of at least the following.									
	luction, Problem Statement, Design Document									
Total contact H	ours: 45 Total Tutorials: - Total	Practical Cla	asses: 3	30	Total Ho	urs: 75				
Text Books:				Desie	Deserve	. <b>.</b>	tion 20			
	s Erl, Service-Oriented Architecture: Concepts			-						
	s Erl, SOA Principles of Service Design , The F s Erl , 2005.			CE-ON	enteu Con	npuun	5 Jerres	110111		
	p Chatterjee, James Webber, Developing En	ternrise \\//	eh Serv	vices A	n Archite	רל' <b>ג ה</b> וי	ide Do	arson		
	on, 2005	CIPIDE W		.cc3, P			, re			
Reference Bool	•									
	oods and Thomas Mattern, Enterprise SOA	Designing	IT for E	Busines	s Innovati	ion , O	'REILLY,	First		
Edition		5 0					,			
Websites:										

Department : C	omputer Science and Engineering	Program	me : M	.Tech. (	Distribute	d System	ıs)			
Semester : T	wo	Category	/ :LI	3						
Subject Code	Subject	Hou	rs / We	ek	Credit	Maximum Mark				
Subject Code	Subject	L	Т	Р	С	CA	SE	TM		
CS158	Advance Software Laboratory II	-	-	3	2	60	40	100		
Prerequisite	-									
Objectives	Working on distributed applic	<ul> <li>Working on distributed applications using Integrated development environment .</li> <li>To understand and get hands on experience in distributed environment.</li> </ul>								
Outcome	<ul> <li>To gain knowledge on developing and deploying web services.</li> <li>To gain knowledge on the flexibility of IDEs .</li> <li>To realize the importance of reengineering.</li> </ul>									
CYCLE - I	Any experiments from the chosen elective courses may be included. Hours: 21									
	<ol> <li>Create a web application using dream weaver/Microsoft Express Editor.</li> <li>Create any web application using MVC Implementation of functional</li> </ol>									
	<ul><li>dependencies and closures of</li><li>3. Scientific computing with Map</li><li>4. Distributed job management s</li></ul>	Reduce.			ing.					
CYCLE - II							Hours:	24		
CYCLE - II       Any experiments from the chosen elective courses may be included.       Hou         1. Application design using UML.       1. Implementation of cryptographic algorithms.       1. Generating OWL script using protégé.         3. Generating OWL script using protégé.       1. Simulation of location monitoring system in sensor networks.       5. Attribute relevance analysis in WEKA and Data classification in WEKA.										
Total contact H		Total Practi				tal Hou	rs: 45			

Department :	Computer S	cience and Engineering	Program	<u>mme : </u> N	/I.Tech. (D	istributed	d Systems	)	
Semester :	Two		Catego	r <b>y :</b> P	R				
Cubic et codo	Cubicat		Hours/	week		Credit	Maximum mark         CA       SE         100       0         ems       100       0         rea of research on the search methods to       100       100         ic program, namely       100       100       100         tulate, Proposition, nd Characteristics; T       100       100       100         tulate, Proposition, nd Characteristics; T       100       100       100       100         tulate, Proposition, nd Characteristics; T       100	ks	
Subject code	Subject		L	Т	Р	С	CA	SE	ТМ
CS159	Research I	Methodology	-	-	3	1	C       CA       SE         1       100       0         oblems	100	
Prerequisite	-								
Objectives	• To	educate students to met	hods of sel	ection c	of researcl	h problem	าร		
Objectives	• To	expose students to differ	rent resear	ch meth	nods				
	• St	udents will be capable to	identify an	d narro	w down t	o the are	a of resea	arch on t	he bas
	th	e requirements of industr	ial and glob	bal requ	irements				
Outcomos	• St	udents will exhibit the d	lomain skil	l to cho	oose suita	able resea	arch met	hods to	execut
Outcomes	re	search effectively							
	• St	udents will possess kno	wledge to	furthe	er their a	cademic	program	, namel	y, Ph.I
	pr	ogram.							
<ul> <li>Definit</li> </ul>	tion of res	earch: Research - Defin	nition; Con	cept of	f Constru	ct, Postu	late, Pro	position,	, Thesi
Hypot	nesis, Law, I	Principle. Definition and D	Dimension	of a The	eory, Fund	ctions and	d Characte	eristics;	Types o
Theory	: General 1	Theory and Particular/ En	npirical The	eory. Ca	ases and	their Limi	itations; (	Causal R	elation
Philos	ophy and va	lidity of research. Objectiv	ve of resear	rch.					
Chara	teristics of	research: Various functio	ons that des	scribe cl	haracteris	tics of res	search su	ch as sys	temati
		mpirical and critical appro-						•	
• Types	of researc	h: Pure and applied rese	earch. Des	criptive	and expl	lanatory i	research.	Qualita	tive an
quanti	tative appro	baches.		-		-			
Resea	rch procedu	ure: Formulating the Rese	earch Prob	lem, Lit	terature F	Review, D	eveloping	g the ob	jective
Prepai	ing the rese	earch design including sam	nple. Desigr	n, Sampl	le size.				
Consid	erations in	selecting research proble	em: Releva	nce, int	erest, ava	ilable dat	a, choice	of data,	Analys
of data	a, Generaliza	ation and interpretation o	f analysis.						
Outco	me of resea	arch: Significance of repor	rt writing –	Layout	s of the re	esearch re	eport – Ty	/pes of r	eports
Oral p	resentation	- Mechanics of writing	research r	eport –	Precauti	ons for w	vriting res	search r	eports
Plagia	rism and co	oy right violation – Patent	writing and	d filing.					
Total contact	hours: -	Total tutorials: -	Total pr	actical	classes:15	5	Total h	ours: 15	•
Reference boo	ks:		- <b>4</b>			<b>I</b>			
1. Dawsc	n, Catherin	e, Practical Research Meth	nods, UBS F	ublishe	ers and Dis	stributors	, New Del	hi, 2002	
	•	-	-					-	
		earch Methodology, A Ste		•	•				
	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		, , P		0		,,		,

Singapore, 2005.

Department : C	omputer Science and Engineering	Progra	mme	: M.Tech.	(Distribut	ed Syste	ems)	
Semester : 1	hree	Catego	ory :	PR				
Subject Code	Course Name	Но	urs / V	Veek	Credit	Maxi	mum M	arks
Subject Code	Course Name	L	Т	Р	C	СА	SE	ТМ
CS160	Project Work (Phase I)	-	-	-	9	150	150	300
Prerequisite	-							
Objectives	<ul> <li>To expose students with project technologies.</li> <li>To understand the Product Develor</li> <li>To plan for various activities of the product of</li></ul>	pment C	Cycle th			ising of	state-	of-art
Outcome	<ul> <li>Exposure to Learning and knowl papers and participation in research</li> </ul>	-		echnique	es using C	Conferer	nces, Jo	urnal
Phase I								
	1. Select a Research Problem.							
	2. Conduct a Survey in the chosen are	ea.						
	3. Perform a feasibility study.							
	4. Study the limitations of the Existin	g Systen	٦.					
	5. Define the Problem Statement and	d Objecti	ves.					
	6. Choose the Research Methodology	y.						
	7. Finalize the Experimental Environr	nent.						
	8. Choose the evaluation parameters	5.						
	9. Implement the Existing System.							
	10. Document the outcome of Phase I	•						
Total contact H	ours: - Total Tutorials: -	Total F	Practic	al Classes	5: -	Tota	l Hours	:-

Department : (	Computer Science and Engineering	Progra	amme :	M.Tech.	(Distribute	d Syste	ms)	
Semester :	Four	Catego	ory :	PR				
Subject Code	Course Name	Ho	ours / W	/eek	Credit	Maxi	mum N	1arks
Subject Code	Course Name	L	Т	Р	С	CA     SE       200     200       / International project .	ТМ	
CS161	Project Work (Phase II)	-	-	-	14	200	200	400
Prerequisite	-							
Objectives	<ul> <li>To encourage and expose student presentation activities.</li> <li>Acquire in depth working knowledge</li> </ul>					Interna	tional µ	oaper
Outcome:	<ul> <li>Acquire knowledge and skills needed</li> <li>Enhance the technical presentation</li> <li>Inculcate the practice of publishing i</li> </ul>	skills.			0,	ftware (	oroject	
Phase I								
	1. High level Design of the Proposed S	olution.						
	2. Detailed Design of the Proposed Sol	ution.						
	3. Implementation of the Proposed Sol	ution.						
	4. Comparison of the performance with	n the ex	isting sy	/stem.				
	5. Document the results in the Project	Report.						
Total contact H	ours: - Total Tutorials: - Total P	ractical	Classes	: -	Total Ho	urs: -		

**SYLLABUS (Elective Subjects)** 

Department : C	Computer Science and Engineering	Prog	ramme	: M.Te	ch. (Distrib	uted Sy	stems)	
Semester :		Categ	gory	:TY				
Subject Code	Subject	Но	urs / W	/eek	Credit	yer. Computing. H d Gateway- Ap nals – Antenna Ommunication Allocation Protocol Ing and Encap oc Networks: Mobile Transpo L - Security an ation-Based Eff L - Security an ation-Based Eff	Marks	
Subject Code	Subject	L	Т	Р	C	СА	SE	ТМ
CSE51	Mobile Computing Systems	3	1	-	4	40	60	100
Prerequisite	-							
	<ul> <li>Introduction to the basics of Wire</li> </ul>	less tra	nsmiss	ion basi	cs.			
Objectives	<ul> <li>To have a wide knowledge on Lay</li> </ul>	ers in N	1obile I	_ayers.				
	<ul> <li>Security issues in Mobile Comput</li> </ul>							
	On successful completion of the course, s	tudents	will be	e able to	):			
0	<ul> <li>Posses knowledge on digital data</li> </ul>	transfe	r and d	igital m	obile comn	nunicat	ion syst	ems.
Outcome	<ul> <li>Knowledgeable Protocols in mobil</li> </ul>	le netw	ork lay	er and t	ransport la	iyer.		
	<ul> <li>Be well versed in the standards and</li> </ul>	nd issue	s in Wi	reless a	nd Mobile	Compu	iting.	
UNIT – I	Mobile Computing						ł	lours: 09
Introduction –	Technology overview – Research Issues –D	ialogue	contro	ol – Mid	ldleware ar	nd Gate	way- A	pplicatio
and services –	Security - Standards- Architecture of Mo	bile Sof	tware	Applica	tions – Sig	nals –	Antenna	as and it
types-Signal pr	opagation – MAC							
UNIT – II	Telecommunication						ŀ	lours: 0
Group of Specia	al mobile – General Packet Radio Service -	- Digital	Enhan	ced Co	rdless telec	commu	nication	(DECT) -
IMT-2000 and	UMTS- Satellite communication basics – Satellite communication basics	atellite	networ	rk confi	guration –	Allocat	ion of F	requency
for mobile sate	llite services – Iridium Systems – Digital Vid	eo broa	dcastir	ng – Wii	eless Appli	cation	Protoco	l (WAP)
UNIT – III	Mobile Network Layer							Hours: 0
Mobile IP- IP F	Packet Delivery- Agent Advertisement and	Discov	ery – I	Registra	tion-Tunne	eling an	id Enca	osulation
Optimizations-	Reverse Tunneling - IPv6-Dynamic Host	: Config	guratio	n Proto	ocol. Ad H	loc Ne	tworks:	Routing
Destination Sec	quence Distance Vector-Dynamic Source R	outing-	Hierard	hical A	lgorithms.	Mobile	Transp	ort Layeı
Traditional TCP	-Congestion Control -Indirect TCP- Snoopin	g TCP-N	1obile 1	ГСР				
UNIT – IV	Mobility and Location Based Services							Hours: 0
Data Acquisitio	n of Location Information – GIS - Location I	nformat	tion M	odeling	- Location-	Based S	Services	Applied
Utilizing Location	on-Based Services with Mobile Applications	- Repre	esentin	g Locati	on with UN	ИL - Seo	curity ar	nd Privac
of Location Info	rmation - Localization and Internationaliza	tion - La	itest De	evelopn	nents in Loo	cation-l	Based Ef	forts
UNIT – V	Security Issues in Mobile Computing							Hours: 0
	curity – Techniques and Algorithm – Securi	ty Proto	cols –	Public K	ey Infrastr	ucture	– Trust -	- Security
Models – Secur	ity Framework for mobile computing.							
Total contact H	ours: 45 Total Tutorials: 15 Tota	l Practio	al Clas	ses: -	Total H	lours: 6	50	
Text Books:								
	K. Talukar, Mobile Computing, Second Editi				•			
	'Far ,Mobile Computing Principles: Design	ing and	Devel	oping N	Nobile App	licatior	ns with	UML and
	ambridge University Press, 2004.							
Reference Boo								
	Imielinski and Henry F. Korth ,Mobile Com					ess Meo	dia, 1990	5
	sri Arokiamary ,Mobile Computing, Technic	al publi	cation,	3rd edi	tion, 2009.			
Websites:								
-								

Department : (	Computer S	Science and Engineering	Progra	mme	: M.Tech. (Di	stributed	Syster	ns)	
Semester :	1		Catego		: TY				
Subject Code	Subject		Н	ours /	Week	Credit	Max	imum N	<b>/</b> arks
Subject coue	Jubjeet		L	Т	Р	С	CA	SE	TM
CSE52	Informat	ion Retrieval Techniques	3	1	-	4	40	60	100
Prerequisite		-							
Objectives	eff • Ide Re	ply machine learning techniqu ficient entify and design the various co trieval sign cross language informatior	mponents	of an I	nformation I	_			
Outcome	On succe Bu Ab	ssful completion of the course, ild an Information Retrieval sys ility to analyze the Web conten sign an efficient search engine	students w tem using t	ill be a	able to:				
UNIT – I	Introduo							Hou	rs: 09
		Issues-Retrieval Process–Arc	hitecture-P	Boolea	n Retrieval-	-Retrieva	Fval		
•		ry of Web Search–Web Chara							•
		Search engine-Searching the V			-				
•		awling and Indexing–Link Analy							
UNIT – II	Ontolog							Hou	rs: 09
Ontology Dev	-	- taxonomies-Topic maps-Onto	ology-Defini	ition-e	expressing	ontology	logic	ally-ont	ology
•••	•	RDFS-OWL-OIL-ontology dev	•••		• •		-	•	
Semantic web		07	•				07	U	U
UNIT – III	Modelin	g and Indexing						Hou	rs: 09
Taxonomy and		zation of IR Models–Boolean M	odel–Vecto	or Mod	del-Term We	ighting–			
Scoring and Ra	inking–Lan	guage Models–Set Theoretic N	1odels-Prob	abilist	tic Models–A	lgebraic	Model	s–Struc	tured
Text Retrieval	Models-M	lodels for Browsing. Indexing -	Static and	Dynai	mic Inverted	Indices-	Index	Constru	uction
and Index Co	mpressior	. Searching-Sequential Search	ning and	Patter	n Matching	. Query	Oper	ations-	Query
Languages–Qu		sing-Relevance Feedback and Q	uery Expan	sion-A	utomatic Lo	cal and Gl	obal A	nalysis	
UNIT – IV	Evaluatio	on and Text Classification						Hou	rs: 09
-		and Efficiency Multimedia IR: M		-	-	-		-	
	-	praries. Text Classification -Ve	•						
	-	ocuments. Flat Clustering –Hie	erarchical (	Cluste	ring–Matrix	decompo	sition	s and	latent
semantic index		· · · -							
UNIT – V		Latest Trends							rs: 09
		on retrieval - CLIR- Translation	•						
•		mprove CLIR- Latest Trends in	IR- Query	бу Е	xample - Qi	lery Expa	insion	- Auto	matic
		based Searching. Total Tutorials: 15	Total		al Classes: -	Tatal U	<u></u>	-	
Total contact H	10urs: 45	Total Tutorials: 15	TOLATP	ractic	al Classes: -	Total H	ours: c	50	
		tes, BerthierRibeiro –Neto, Mo		nation	Retrieval: T	he conce	ots and	d Techn	ology
2. Christo	pher D. N	CM Press Books), Second Edition Janning, Prabhakar Raghavan,	Hinrich Sc	hutze	, Introductio	n to Info	ormatio	on Reti	rieval,
	-	rsity Press, First South Asian Edi						<b>(</b> ) <b>(</b> )	
		a, leo J. Obart and Kevin J Smi			o – A guide	to the fu	iture o	ot XML,	Web
		wledge management ,Wiley Pub			atrianal (C	nthas:- '	o o±		
		Graeme Hirst, cross – Langua	-		verneval, (Sy	nunesis L	ecture	S UN H	uman
Reference Boo	-	logies) , Morgan & Claypool Ρι	idiistiets, 20	.600					
		Charles L. A. Clarke, Gordon	V Corma	ick In	formation	otrioual	Imploy	nontin	hac t
Evalua 2. Ricardo	ting Search D Baeza-Ya	Engines, The MIT Press, Cambrates, Berthier Ribeiro–Neto, M	idge, Mass	achuse	etts London,	England,	2010		-
Edition	,2005								
WebSites:									

	omputer Science and Engineering	-			ch. (Distri	buled S	ystems	2)
Semester :		Categor		TY ·				
Subject Code	Subject	Hours	i / We T	ek P	Credit C	Max CA	imum l SE	Marks TM
CSE53	Advanced Distributed System Architectures	3	1	-	4	40	60	100
Prerequisite	-							
Objectives	<ul> <li>To learn the state of the art in distribu</li> <li>To understand the advantages and architectures.</li> <li>To understand the management o organizations.</li> </ul>	d disadva	antage	es of	various			
Outcome	<ul> <li>On successful completion of the course studen</li> <li>Adopt appropriate architecture for rea</li> <li>Develop and implement new ideas to s</li> <li>Design Enterprise Applications with th</li> </ul>	il-world di solve oper	stribu n prob	ted sy Iems	in distrib	•		
UNIT – I	Introduction istributed Systems: Characteristics of Distrib							urs: 09
Centralized Arcl – Interceptors	Designing Distributed Systems – Architecture nitectures – Decentralized Architectures – Hybrid – General Approaches to Adaptive Software - ol Model – Architectural Patterns for Distributed	d Architec – Self-Ma	tures nagem	– Arc nent i	hitecture n Distrib	s Versu	s Midd	lewar
UNIT – II	Middleware	,					Но	urs: 0
open source sol	uses: Information source – EIS/DSS: From Qu utions.	0.100, 10	,			·o •••		
	Client-Server Architecture							
Multiprocessor Client/Server Be tier or multi-tie TP Monitors: I Groupware: C		Client -Sonsaction I Insaction I te or TP- cributed S	erver - <b>Proces</b> Heavy ystem	– Thro sing :	ee-tier Cl The bas TP Mor	ient -Se ics of Tr nitors —	Compu rver – ransact <b>Client/</b>	ting - Three ions - <b>Serve</b>
Multiprocessor Client/Server Be tier or multi-tie TP Monitors: I Groupware: C	Client-Server Architecture architectures – Client-server architecture uilding Blocks – Client -Server model – Two-tier r – Thin Client – Fat Client – Client/Server Tra Managing Client/Server Transactions – TP-Li Component of Groupware – Client/Server Dist	Client -Sonsaction I Insaction I te or TP- cributed S	erver - <b>Proces</b> Heavy ystem	– Thro sing :	ee-tier Cl The bas TP Mor	ient -Se ics of Tr nitors —	Compu rver – ransact Client/ outed S	Three ions - <b>Serve</b>
Multiprocessor Client/Server Bitier or multi-tie TP Monitors: I Groupware: C Management St UNIT – IV Client/Server W architecture – L broker – ORB-b Beans – COM+: Internet: The F	Client-Server Architecture architectures – Client-server architecture uilding Blocks – Client -Server model – Two-tier r – Thin Client – Fat Client – Client/Server Tra Managing Client/Server Transactions – TP-Li Component of Groupware – Client/Server Dist candards – Client/Server Tools and Application D Distributed Object Architecture /ith Distributed Objects: – Distributed Objects a Jses – CORBA – CORBA application structure – C ased object communications – Inter-ORB comm The Other Component Bus – Object Database Appertext Era – The Interactive Era – The Distributed	Client -Se nsaction I te or TP- cributed S evelopme and Comp CORBA sta nunication es – Dist	erver - Proces Heavy ystem ent. onent ndards s – CC ribute	– Thro sing : Man S- Adr s – CC DRBA d Obj	ee-tier Cl The bas TP Mor agement vantages DRBA objeservices	ient -Se ics of Tr nitors – Distril of distr ects – O – ORBs	Compu rver – ransact Client/ outed S Hou ibuted bject r To Ento	ting - Three ions - <b>Serve</b> System urs: 09 objec eques erprise nd the
Multiprocessor Client/Server B tier or multi-tie TP Monitors: I Groupware: C Management St UNIT – IV Client/Server W architecture – L broker – ORB-b Beans – COM+: Internet: The H UNIT – V	Client-Server Architecture architectures – Client-server architecture uilding Blocks – Client -Server model – Two-tier r – Thin Client – Fat Client – Client/Server Tra Managing Client/Server Transactions – TP-Li component of Groupware – Client/Server Dist candards – Client/Server Tools and Application D Distributed Object Architecture /ith Distributed Objects: – Distributed Objects a Jses – CORBA – CORBA application structure – C ased object communications – Inter-ORB comm The Other Component Bus – Object Database Hypertext Era – The Interactive Era – The Distributed	Client -Sonsaction I te or TP- cributed Son evelopme and Comp CORBA stan ounication es – Dist uted Obje	erver - Proces Heavy ystem ent. onent ndards s – CC ribute ct Era.	– Thro sing : Man S- Adr s – CC DRBA d Obj	ee-tier Cl The bas TP Mor agement vantages DRBA obj services ects – C	ient -Se ics of Tr nitors – Distril of distr ects – O – ORBs lient/Se	Compu rver – ransact Client/ buted S Hou ibuted bject r To Ente rver a	ting - Three ions - Serve Systen urs: 09 objec eques erprise nd the urs: 09
Multiprocessor Client/Server Bitier or multi-tie TP Monitors: I Groupware: C Management St UNIT – IV Client/Server W architecture – L broker – ORB-b Beans – COM+: Internet: The F UNIT – V Peer-Peer Archi Organization – I Extraterrestrial P2P systems an DHT-based P2P Tangible benefit	Client-Server Architecture architectures – Client-server architecture uilding Blocks – Client -Server model – Two-tier r – Thin Client – Fat Client – Client/Server Tra Managing Client/Server Transactions – TP-Li Component of Groupware – Client/Server Dist candards – Client/Server Tools and Application D Distributed Object Architecture /ith Distributed Objects: – Distributed Objects a Jses – CORBA – CORBA application structure – C ased object communications – Inter-ORB comm The Other Component Bus – Object Database Appertext Era – The Interactive Era – The Distributed	Client -S nsaction I te or TP- ributed S evelopme and Comp ORBA sta nunication es – Dist uted Objec challenges adigms – antages – Avaki and SOA to p	erver - Proces Heavy ystem ent. onent ndards s – CC ribute ct Era. S – Pla Centra Decen d PAS SOA – ast are	- Thro sing : Man S- Adro s - CC DRBA d Obj cing I alized tralized tralized tralized char chitec	ee-tier Cl The bas TP Mor agement vantages DRBA obj services ects – C ects – C pects –	ient -Se ics of Tr nitors – Distril of distr ects – O - ORBs lient/Se on Secu ems: SE ystems: System s–Work REST an	Compu rver – ransact Client/ outed S Hou ibuted bject r To Ente rto Ente rter a Hou rity wir TI (Sea Unstru s: Best flow o d syste	ting Three ions Serve Systen urs: 09 objec eques erprise nd the urs: 09 thin an rch fo ictured Peer f SOA- ems o
Multiprocessor Client/Server Ba tier or multi-tie TP Monitors: I Groupware: C Management St UNIT – IV Client/Server M architecture – L broker – ORB-b Beans – COM+: Internet: The F UNIT – V Peer-Peer Archi Organization – I Extraterrestrial P2P systems an DHT-based P2P Tangible benefi systems.	Client-Server Architecture architectures – Client-server architecture uilding Blocks – Client -Server model – Two-tier r – Thin Client – Fat Client – Client/Server Tra Wanaging Client/Server Transactions – TP-Li component of Groupware – Client/Server Dist andards – Client/Server Tools and Application D Distributed Object Architecture /ith Distributed Objects: – Distributed Objects a Uses – CORBA – CORBA application structure – C ased object communications – Inter-ORB comm The Other Component Bus – Object Database Hypertext Era – The Interactive Era – The Distributed Differentiate Peer-to-Peer paradigm – features and Differentiate Peer-to-Peer with client server par Intelligence), Napster – Advantages and Disadva d Structured P2P systems – Gnutella, FreeNet, systems – Service Oriented Architecture: Func- ts – Pitfalls – Evolution of SOA – Comparing services and SOA – Service Oriented Architecture	Client -Se nsaction I te or TP- ributed S evelopme and Comp ORBA stan unication es – Dist uted Objec challenges antages – Avaki and SOA to p ture for E	erver - Proces Heavy ystem ent. onent ndards s – CC ribute ct Era. Son – Pla Centra Decen d PAS <sup>-</sup> SOA – ast are Enterp	– Thro sing : Man Man s- Adv s – CC DRBA d Obj cong I alized tralized tralized tralized tralized tralized	ee-tier Cl The bas TP Mor agement vantages DRBA obj services ects – C ects – C pects –	ient -Se ics of Tr hitors – – Distril of distr ects – O – ORBs lient/Se on Secu ems: SE /stems: System s–Work REST an	Compu rver – ransact Client/ outed S Hou ibuted bject r To Ente rto Ente rter a Hou rity wir TI (Sea Unstru s: Best flow o d syste	ting Three ions Serve Systen urs: 0 objec eques erpris nd th urs: 0 thin al rch fo cture Peer f SOA ems c
Multiprocessor Client/Server Bitier or multi-tie TP Monitors: I Groupware: C Management St UNIT – IV Client/Server M architecture – U broker – ORB-b Beans – COM+: Internet: The F UNIT – V Peer-Peer Arch Organization – I Extraterrestrial P2P systems an DHT-based P2P Tangible benefit systems – Web	Client-Server Architecture architectures – Client-server architecture uilding Blocks – Client -Server model – Two-tier r – Thin Client – Fat Client – Client/Server Tra Wanaging Client/Server Transactions – TP-Li component of Groupware – Client/Server Dist andards – Client/Server Tools and Application D Distributed Object Architecture /ith Distributed Objects: – Distributed Objects = Uses – CORBA – CORBA application structure – Claed Ses – CORBA – CORBA application structure – Claed Object communications – Inter-ORB comm The Other Component Bus – Object Database Hypertext Era – The Interactive Era – The Distributed Differentiate Peer-to-Peer paradigm – features and Differentiate Peer-to-Peer with client server par Intelligence), Napster – Advantages and Disadva d Structured P2P systems – Gnutella, FreeNet, systems – Service Oriented Architecture: Func- ts – Pitfalls – Evolution of SOA – Comparing services and SOA – Service Oriented Architecture	Client -Se nsaction I te or TP- ributed S evelopme and Comp ORBA stan unication es – Dist uted Objec challenges antages – Avaki and SOA to p ture for E	erver - Proces Heavy ystem ent. onent ndards s – CC ribute ct Era. Son – Pla Centra Decen d PAS <sup>-</sup> SOA – ast are Enterp	– Thro sing : Man Man s- Adv s – CC DRBA d Obj cong I alized tralized tralized tralized tralized tralized	ee-tier Cl The bas TP Mor agement vantages DRBA objo services ects – C ects – C pformati P2P Syst ed P2P Syst ed P2P Syst brid P2P acteristic tures –	ient -Se ics of Tr hitors – – Distril of distr ects – O – ORBs lient/Se on Secu ems: SE /stems: System s–Work REST an	Compu rver – ransact Client/ outed S Hou ibuted bject r To Ente rto Ente rter a Hou rity wir TI (Sea Unstru s: Best flow o d syste	ting Three ions <b>Serve</b> Syster <b>urs: 0</b> objec eques erpris nd th <b>urs: 0</b> thin a rch fo cture Peer f SOA ems c

 Thomas Erl, Service-Oriented Architecture: Concepts, Technology & Design, Pearson Education Pvt Lt 2008.

3.	Andrew S.Tanenbaum and Maarten Van Steen, Distributed Systems, Pearson Education, 2014.
Refe	rence Books:
1.	Abhijit Belapurkar, Anirban Chakrabarti, Harigopal Ponnapalli, Niranjan Varadarajan, Srinivas
	Padmanabhuni and Srikanth Sundarrajan, Distributed Systems Security: Issues, Processes and Solutions,
	Wiley Pubilications, 2009.
2.	Gupta,IT Infrastructure and Its Management, Tata Mc graw Hill Publishing Company Limited 2009.
3.	Q.H. Vu, Lupu, M and Oai, B.C., Peer-to-Peer Computing, Springer-Verlag Berlin Heidelberg, 2010.
4.	Kai Hwang, Jack Dongarra and Geoffrey C. Fox, Distributed and Cloud Computing: From Parallel Processing
	to the Internet of Things, Morgan Kaufmann Publishers, 2011.
Websit	tes:
1.	https://msdn.microsoft.com/en-us/library/dd129906.aspx
2.	www.aosabook.org/en/distsys.html
3.	jan.newmarch.name/go/arch/chapter-arch.html
4.	http://www.vitanuova.com/inferno/papers/styx.html

Department : Co	omputer Science and Engineering	Program	nme : N	/l.Tech.	(Distribu	ted Sys	stems)	
Semester :		Categor	' <b>y :</b> ⊺	Ϋ́				
	Cubicat	Hou	rs / We	ek	Credit	Maxi	mum N	Лarks
Subject Code	Subject	L	Т	Р	С	СА	SE	ТМ
CSE54	Machine Learning	3	1	-	4	40	60	100
Prerequisite	-							
Objectives	<ul> <li>The students are to</li> <li>Be exposed to the overview of mach</li> <li>Understand the decision theory and</li> <li>Understand the underlying mather learning.</li> <li>Get an overview of the dimensionality</li> </ul>	parametri ematical	and p	ods. probabi	lity stru	-	in Ma	chine
Outcome	<ul> <li>At the end of the course the students will be</li> <li>Understand the theories and conception</li> <li>Identify, formulate and analyze maction</li> <li>Interpret the process and evaluation</li> </ul>	able to: ots of supe hine learr	ervised iing pro	learnin blems.	g.			
UNIT – I	Introduction and Supervised Leaning						Hou	rs: 09
	Machine Learning – Applications – Learn	-					-	
	earning – Reinforcement Learning – Supervised ximately Correct (PAC) Learning – Noise –	-	-					
UNIT – II	Bayesian Decision Theory and Parametric M	ethods					Hou	rs: 09
Information – B Likelyhood estir	on Theory – Classification – Losses and Risks ayesian Networks – Influence Diagrams – As nation – Bernoulli Density – Multinomial Dens ng Model complexity – Model selection proced	ssociation Sity – Gau	rules -	- Parar	netric me	ethods	– Maxi	imum
UNIT – III	Multivariate Methods and Dimensionality R	eduction					Hou	rs: 09
Features – Mult	thods – Parameter estimation – Multivariate ivariate regression – Dimensionality reduction Multidimensional scaling – Linear discriminat	– Subset	selectio		•	•	•	
UNIT – IV	Clustering and Non-Parametric Methods						Hou	irs: 09
– Non-parametr	ture densities – k-Means clustering – Expectat ic methods – Histogram estimator – Kernel e te trees – Pruning – Rule extraction from trees	stimator -	- k-Nea	irest ne	eighbor e	stimato	or – De	cision
UNIT – V	Multilayer Perceptions and Local Models						Hou	rs: 09
Local models –	eptions – Neural networks – perceptron – Tra Competitive learning – Radial basis function v processes – Evaluation problem – State	s – Mixtu	re of e	xperts	– Hidder	Mark	ov mod	dels –
Total contact Ho	ours: 45 Total Tutorials: 15	Total Pr	actical	Classes	s: -	Total I	lours: (	5 <b>0</b>
Text Books:								
1. Ethem A	Ipaydin, Introduction to Machine Learning, N	1IT Press,	2004.					
Reference Book	s:							
<ol> <li>Kaufman</li> <li>Goldber</li> <li>Learning</li> </ol>	uillermo Carbonell and Tom Michael Mitchell, nn, 1994. g and David E, Genetic Algorithms in Search. C g , Pearson Education, New Delhi, 1989.			-	-			
Websites:								
	npe.boun.edu.tr/~ethem/i2ml2e l.acm.org/citation.cfm?id=1734076							
2. http://u								

	Computer Science and Engineering	Programme	: M.Teo	ch. (Dist	nbuted Sy	stemsj		
Semester :			: TY					
Subject Code	Course Name	Hours	/ Weel	<b>(</b>	Credit	CA       SE         40       60         re agents.       ogy         ware agents.       Hour         lications, Program       Hour         lications, Program       Ween agents – Rea         n – Agent Cooperat       Hour         Distributed Plann       Path finding proble         Hour       Hour         • Distributed Plann       Path finding proble         Hour       Hour         • Bargaining – Ge       Hour         acation.       Hour         Modeling organiza       Hour         design, Agent orie       Agent Communic         ours: 60       Hour         Intelligent, MIT p       Hour	arks	
Subject Code		L	Т	Р	С	CA	SE	ТМ
CSE55	Agent Technology	3	1	-	4	40	60	100
Prerequisite	-							
	The students are to							
Objectives	<ul> <li>Be introduced the concepts, te</li> </ul>	echniques and	applica	ations o	f software	agents.		
Objectives	<ul> <li>Get an overview of problem s</li> </ul>	olving techniq	ue usir	ng agent	technolog	5Y		
	<ul> <li>Acquire an understanding of a</li> </ul>	agent based sy	stem d	levelopr	nent			
	At the end of the course the students	will be able to:						
Outcome	<ul> <li>Understand the basic concepts</li> </ul>	s techniques a	nd app	lication	s of softwa	ire agent	ts.	
Outcome	<ul> <li>Learn to develop a agent base</li> </ul>	ed system.						
	<ul> <li>Gain Knowledge in Multi agen</li> </ul>	t and Intelliger	nt ager	its.				
UNIT – I							Hou	rs: <b>0</b> 9
Introduction to	Agents (Definition, Properties, Lifecy	cle, Environm	ent, Ty	vpes, Us	es, Applic	ations, I	Progran	nming
paradigm, Com	munications, Architecture) – Multi-Age	nt Systems (M	IAS) –	Interac	tion betwe	een ager	its – Re	active
Agents – Cognit	tive Agents – Interaction protocols – Ag	ent coordinati	on – Ag	gent neg	gotiation –	Agent C	Coopera	tion -
Agent Organiza	tion – Self-Interested agents in Electron	ic Commerce A	Applica	itions.				
UNIT – II								
	blem Solving and Planning – Introducti		-		-			-
	nning and Execution. Search Algorithm f	for Agents – Co	onstrai	nt satisf	action – P	ath findi	ng prob	lem –
two player gam	e							
UNIT – III							Hou	ırs: 09
Distributed Rela	ation Decision making – Introduction Ev	aluation Crite	ria – V	oting – <i>i</i>	Auctions –	Bargain	ing – Ge	enera
Equilibrium ma	rket mechanisms – Contract nets – coa	alition formati	on Lea	rning in	multi-age	nt syste	m – Lea	arning
and activity coc	rdination – Learning about and from ot	her agents – L	earnin	g and Co	ommunicat	tion.		
UNIT – IV							Hou	ırs: 09
-							organiz	ations
Computational	Organization Theory – Introduction	Organizational	Conce	epts us	eful in mo	odeling		
	Organization Theory – Introduction ( s in DAI – Logic based representation ar	-	Conce	epts us	eful in mo	odeling		
	-	-	Conce	epts us	eful in mo	odeling	-	ırs: 09
Formal Method UNIT – V	-	nd reasoning.					Hou	
Formal Method UNIT – V Agent based s	s in DAI – Logic based representation ar	nd reasoning. oriented analy	ysis, A	gent or	iented de	sign, Ag	Hou ent ori	ented
Formal Method UNIT – V Agent based so Implementation	s in DAI – Logic based representation ar ystem development Lifecycle (Agent	nd reasoning. oriented analysis and languag	ysis, A ges – .	gent or IADE, A	iented de GLET – A	sign, Ag	Hou ent ori	ented
Formal Method UNIT – V Agent based so Implementation	s in DAI – Logic based representation ar ystem development Lifecycle (Agent n) – Agents Development frameworks ML – Agent Oriented methodologies –	nd reasoning. oriented analysis and languag	ysis, A ges – . ropos,	gent or IADE, A Promet	iented de GLET – A	sign, Ag gent Co	Hou ent ori	ented
Formal Method UNIT – V Agent based s Implementation Languages – KO	s in DAI – Logic based representation ar ystem development Lifecycle (Agent n) – Agents Development frameworks ML – Agent Oriented methodologies –	nd reasoning. oriented analys and languag GAIA, MASE, T	ysis, A ges – . ropos,	gent or IADE, A Promet	iented de GLET – A heus.	sign, Ag gent Co	Hou ent ori	
Formal Method UNIT – V Agent based s Implementation Languages – KC Total contact H Text Books:	s in DAI – Logic based representation ar ystem development Lifecycle (Agent n) – Agents Development frameworks ML – Agent Oriented methodologies –	nd reasoning. oriented analys and languag GAIA, MASE, T	ysis, A ges – . ropos,	gent or IADE, A Promet	iented de GLET – A heus.	sign, Ag gent Co	Hou ent ori	ented
Formal Method UNIT – V Agent based so Implementation Languages – KO Total contact H Text Books: 1. Bradsha 2. Michae	s in DAI – Logic based representation ar ystem development Lifecycle (Agent n) – Agents Development frameworks ML – Agent Oriented methodologies – ( ours: 45 Total Tutorials: 15 To aw, Software Agents , MIT Press, 2000 I Wooldridge, Introduction to Multi-age	nd reasoning. oriented analys and languag GAIA, MASE, T otal Practical (	ysis, A ges – . ropos, C <b>lasses</b>	gent or IADE, A Promet : -	iented de GLET – A heus. <b>Total Hou</b>	sign, Ag gent Co	Hou ent ori	ented
Formal Method UNIT – V Agent based s Implementation Languages – KO Total contact H Text Books: 1. Bradsha	s in DAI – Logic based representation ar ystem development Lifecycle (Agent n) – Agents Development frameworks ML – Agent Oriented methodologies – ( ours: 45 Total Tutorials: 15 To aw, Software Agents , MIT Press, 2000 I Wooldridge, Introduction to Multi-age	nd reasoning. oriented analys and languag GAIA, MASE, T otal Practical (	ysis, A ges – . ropos, C <b>lasses</b>	gent or IADE, A Promet : -	iented de GLET – A heus. <b>Total Hou</b>	sign, Ag gent Co	Hou ent ori	ented
Formal Method UNIT – V Agent based s Implementation Languages – KO Total contact H Text Books: 1. Bradsha 2. Michae Reference Bool 1. Gerhard	s in DAI – Logic based representation ar ystem development Lifecycle (Agent n) – Agents Development frameworks ML – Agent Oriented methodologies – ( ours: 45 Total Tutorials: 15 To aw, Software Agents , MIT Press, 2000 I Wooldridge, Introduction to Multi-age	nd reasoning. oriented analy s and languag GAIA, MASE, T otal Practical ( ent system , Jo	ysis, A ges – , ropos, Classes hn Wil	gent or IADE, A Promet : -	iented de GLET – A heus. <b>Total Hou</b> ns, 2002,	sign, Ag gent Co urs: 60	Hou ent ori mmunio	ented catior
Formal Method UNIT – V Agent based s Implementation Languages – KO Total contact H Text Books: 1. Bradsha 2. Michae Reference Bool 1. Gerhard 2000.	s in DAI – Logic based representation an ystem development Lifecycle (Agent n) – Agents Development frameworks ML – Agent Oriented methodologies – ( ours: 45 Total Tutorials: 15 To aw, Software Agents , MIT Press, 2000 I Wooldridge, Introduction to Multi-agents ks:	nd reasoning. oriented analys and languag GAIA, MASE, T otal Practical ( ent system , Jo rn approach t	ysis, A ges – . ropos, <b>Classes</b> hn Wil	gent or JADE, A Promet : -	iented de GLET – A heus. <b>Total Hou</b> ns, 2002, Artificial Ir	sign, Ag gent Co Irs: 60	Hou ent ori mmunio	ented catior press,

-	Computer Science and Engineering			Fech. (	Distributed	d Systen	ns)	
Semester :		Category				1		
Subject Code	Subject	Hou	rs / Wee	1	Credit	CA       SE         4       40       60         Instraints related to inication.       for the second secon	larks	
Subject code		L	Т	Р	С	CA	SE	ТМ
CSE56	Optical Communication Networks	3	1	-	4	40	60	100
Prerequisite	-							
Objectives	<ul> <li>Illustrate the concepts of states topology design and identify the Explain the mechanism to trans</li> <li>Design an algorithm for dynam</li> <li>Design an optical network which</li> </ul>	e importand sfer the conf ically establ	ce of Op trol info ishing a	tical co rmatio lightpa	ommunicat n in optica ath.	ion.		virtuai
Outcome	<ul> <li>On successful completion of the course</li> <li>Appriciate the necessity of stat</li> <li>Distiguish between static traffie</li> <li>Explain the concepts related network.</li> <li>Develop algorithms to transfer</li> </ul>	ic traffic rou c routing and to virtual	iting and d dynam topolog	l const iic traf y recc	fic routing onfiguratio	n, surv	ivability	of the
UNIT – I	Types of Optical Networks							ours: 09
	optical networks – Principles of optical	transmissior	ı – Evolu	ution o	f optical n	etworks		
-	echnologies – Wavelength division mult vorks, linear lightwave networks, and wa		-					
UNIT – II	Static Routing and Virtual Topology De	esign					Но	ours: 09
algorithms - o	outing in wavelength routed network: design of multi-fiber networks – Virt due to traffic changes - reconfiguration	tual topolo	gy reco	nfigura	ation – p	roblem	formula	
UNIT – III	Dynamic Routing				·			ours: 09
•	c routing in wavelength routed netword distributed control – Introduction to W		-		-	-	-	
UNIT – IV	Control Management of Optical Netwo	ork					Но	ours: 09
	anagement – Functions – Framework – Ietwork Survivability – Protection in So hemes.				•			
UNIT – V	Advanced Issues						Но	ours: 09
•	n optical Internets – burst switching – p rees - Access Networks – PON, FTTC, FTT		•					uting -
Total contact H	Iours: 45 Total Tutorials: 15 T	otal Practica	al Classe	s: -	Total H	ours: 60	)	
Prentic 2. B. Muk 3. Rajiv R	Ram Murthy and Mohan Gurusamy, W e-Hall of India, 2002. herjee,Optical WDM Networks, Springer amaswami and Kumar N. Sivarajan, Opter Indian Edition), Second edition, 2004.	, 2006.				_	-	
Reference Boo								
<ol> <li>Greg B and Sta</li> </ol>	emstein, Bala Rajagopalan and Debanja andards, Pearson Education, 2004.							otocol
	lack, Optical Networks - Third Generatio	n Transport	Systems	, Pears	son Educat	ion, 200	)2.	
Web Sites :								
	www.cse.wustl.edu/~jain/cis788-99/ftp/	-						
• • • •	www.cse.buffalo.edu/~qiao/cse620/wdr		•					
• • • •	grail.cba.csuohio.edu/~arndt/optical%20		t					
	/sit.iitkgp.ernet.in/research/aut05vol/top				weat			
5. http://	www.cambridge.org/resources/0521868	2003/2303		apter9	.րիւ			

•	omputer Scie	ence and Engineering				ch. (Distrik	outed Syst	tems)	
Semester :	1			gory	:TY	r	1		
Subject Code	Subject			ours / W	1	Credit		iximum	1
-	-		L	T	Р	C	CA	SE	TM
CSE57	Software A	rchitecture	3	1	-	4	40	60	100
Prerequisite	-								
		learn how to develop qu	-	-					
Objectives		introduce fundamentals		-					
		understand the softwar							
		dents would have acqui		-					
Outcome		dents would be able to	-	•			• •		
	• Stu	dents would be able to	choose from	a set o	faltern	ative desi	gns		
UNIT – I	Concepts								ours: 09
	-	tivities – Elements of d	-	tware o	quality	models ar	nd their e	effects –	Quality
Attributes – Bas	1	ftware design – Design p	process.						
UNIT – II		Architecture							ours: 09
		nitecture – Architectura	•				•		
	•	composition and decom	positions –	Data F	low Sty	'le – Call a	nd Returi	n – Inde	pendent
components – D		and virtual machine.					r		
UNIT – III	-	esign and Design Space							ours: 09
Choices of style	s and their c	ombination – Hierarchio	cal styles – S	Simultar	neously	heteroge	neous sty	le – Loca	ationally
heterogeneous	style – Theor	y of design spaces – Des	ign Space of	eleme	nts – De	esign Space	e of Styles	5.	
UNIT – IV		re Evaluation							ours: 09
•		ating modifiability – Eva	luating Perf	ormanc	e – SA	AM Metho	d – The p	process:	Analysis
and Evaluation	1	•					I		
UNIT – V		re Evaluation Methods							ours: 09
•		Analysis Activities – Qua	ality Models	– Cons	structio	n of qualit	ty models	– Deriv	ation of
quality features			1			r			
Total contact H	ours: 45	Total Tutorials: 15	Total Pra	tical Cla	asses:	- <b>To</b> t	tal Hours	60	
Text Books:									
-		ign Methodology: From	Principles to	o Archit	ectural	Styles , Bu	utterwort	h-Heine	mann
	blishers, 2013	B.							
Reference Book									
	-	I Software Architecture		0.		0	-		
		Kazman and Mark Kle		ing Sof	tware	Architectu	res – Me	thods a	nd Case
		w Price Edition, India, 20		_					
•		id Garlan, Software Arc	chitecture –	Perspe	ctives c	of an Emer	ging Disc	ipline , P	rentice
	ndia, 2008.						c	• • • •	
		bject Oriented Analysis	-	-					
		n H. Dutoit, Object-Ori	lented Softw	vare En	gineeri	ng Using l	JML, Patt	erns, an	id Java
	LOW Price Ed	dition, India, 2008.							
Websites:									
•	www.bredem				/				
• • • •		n/developerworks/ratio	nal/library/f	eb06/ee	eles/				
	www.coi.cmu	.edu/architecture/							

•	omputer Science and Engineering			: M.T	ech. (Distrib	outed Syste	ms)	
Semester :		Cate		:TY				
Subject Code	Subject	Ηοι	irs / W	eek	Credit	Ma	<u>ximum M</u>	larks
Subject code	-	L	Т	Ρ	С	CA	SE	ТМ
CSE58	Distributed Algorithms	3	1	-	4	40	Aximum M         SE         60         es         gineering pr         inciple         H         nous Netwo         a General         rocess failu         H         ronous Shar         H         rocess failu         H         rocess Failu         Failure Decole         col- alterna         roperties ar	100
Prerequisite	-							
	To gain depth knowledge abo	ut the	Distrib	uted A	lgorithms			
Objectives	To design efficient algorithms	using	Distrib	uted A	lgorithmic T	echniques		
	Introduce development of dis	tribute	d algo	rithms	for solving	larger engi	neering p	roblems
	On successful completion of the cours	e, stud	lents w	ill be a	able to:			
Outcomo	Design and Develop the algor	thms ι	ising D	istribu	ted prograr	nming prin	ciple	
Outcome	Identify, analyze, formulate and	nd solv	e large	r engi	neering prol	blems.		
	Analyze and Implement differ	ent alg	orithm	ı desig	n technique	S		
UNIT – I	Distributed Algorithms						F	lours: 09
Introduction to	Distributed Algorithms-Kinds of Distribu	ted Alg	gorithn	า- Timi	ing Models.	Synchrono	us Netwo	ork
Algorithms: Syn	chronous Network Model-Leader Electic	on in a	synchr	onous	Ring- Algor	ithms in a (	General	
Synchronous Ne	tworks- Distributed Consensus with Lin	k Failu	es- Dis	tribut	ed Consens	us with Pro	cess failu	ires-
More Consensus	s problems							
UNIT – II	Asynchronous Algorithms						F	lours: 0
Introduction - A	synchronous System Model. Asynchrono	ous Sha	ared M	emory	Algorithms	: Asynchro	nous Sha	red
Memory Model	-Mutual Exclusion-Resource Allocation-G	Consen	sus-At	omic C	Objects.			
UNIT – III	Asynchronous Network Algorithms						F	lours: 09
Introduction -	Asynchronous Network Model- Basic	Async	hronou	us Net	twork Algo	rithms-Syn	chronizer	s-Shared
Memory versus	Networks- Logical Time, Global Snapsho	ots and	Stable	prope	erties.			
UNIT – IV	Network Resource Allocation						F	lours: 09
Introduction – M	Mutual Exclusion-General Resource Allo	cation	- Asyno	chrono	us Network	ks with Pro	cess Failu	ures: The
Network Model	-Impossibility of Agreement in the prese	ence o	Faults	s- A Ra	ndomized A	Algorithm-	Failure D	etectors
k-Agreement- A	pproximate Agreement. Data Link Pro	tocols	: The I	Proble	m- Stennin	g's Protoco	ol- altern	ating Bi
Protocol- Bound	led Tag protocols tolerating Reordering-	Tolera	ting Cr	ashes.				
UNIT – V	Partially Synchronous Algorithms						F	lours: 09
Introduction – I	Partially Synchronous System Models:	MMT a	nd Ge	neral	Timed Auto	mata- Pro	perties a	nd Proo
methods-Model	ing Shared Memory and Network Sys	tems.	Mutua	l Exclu	usion with	Partial Syn	chrony: /	A single
	m- Resilience to Timing Failures- Impos	sibility	Result	s. Con	sensus with	partial Syr	hchrony:	A Failure
	Results-An Efficient algorithm.	1						
Total contact H	ours: 45 Total Tutorials: 15	Tota	Practi	cal Cla	sses: -	Total Hour	's: 60	
Text Books:								
1	A. Lynch, "Distributed Algorithms", Morg	an Kau	fmann	Publis	shers, 2000.			
Reference Book								
	el, Introduction to Distributed algorithm							
	Santoro, Design and Analysis of Distrik	buted A	Algoritl	nms,	Wiley-Inter	science, Jo	hn Wiley	& Sons
	plication, 2007.							
Websites :								
1. http://n	ptel.ac.in							

Semester :	Computer Science and Engineering		-		ech. (Dist	ibuteu	Systems	)
	r		egory	: TY	Cualit			Maulus
Subject Code	Subject	HO	urs / V T	vеек Р	Credit C	CA	aximum SE	TM
CSE59	Data Mining and Warehousing Techniques	3	1	-	4	40	60	100
Prerequisite	-							
Objectives	<ul> <li>To familiarize with clustering, cl</li> <li>To develop and apply critical th</li> <li>To understand the overall arcl and operational design method</li> </ul>	inking, p hitectur	robler	n-solvi	ng, and de	cision-n	naking sl	kills.
Outcomes	<ul> <li>On successful completion of the course,</li> <li>Discover interesting patterns fr solve problems, make predictio</li> <li>Select and apply proper data m</li> <li>Explore Data warehousing me maintaining Data warehousing</li> </ul>	, studen rom larg ns of ou ining alg	e amo tcome gorithm	unt da s n to bu	ta to anal ild analytic	al appli	cations	
UNIT – I	Data Mining							Hours: 09
Transformation Mining: - Efficie	<ul> <li>Data Mining Functionalities – Data</li> <li>Data Reduction – Data Discretization</li> <li>ent and Scalable Frequent Item set Miniming to Correlation Analysis – Constraint-E</li> </ul>	on and ng Meth	Conce ods –	pt Hie Mining	rarchy Ge g Various k	neratio	n. Assoc	iation Rule
UNIT – II	Classification and Prediction							Hours: 09
	es – Associative Classification – Lazy rror Measures – Evaluating the Accuracy Cluster Analysis							
Cluster Analysis Methods – Hie	s: - Types of Data in Cluster Analysis – A erarchical methods – Density-Based Me stering High- Dimensional Data – Constrai	ethods -	- Grid-	Based	Methods	– Mod	el-Basec	-
UNIT – IV	Data Warehousing and Business Analys				1y313 Out		19313.	Hours: 09
	ing Components –Building a Data wareh		Vannir	ng the	Data War	house	to a Mu	110415. 05
			งเสมมา					Itiprocesso
Metadata – re Multidimensior	DBMS Schemas for Decision Support - eporting – Query tools and Applicational Data Analysis.	– Data	Extract	ion, C	leanup, ai	nd Tran		on Tools – OLAP and
Metadata – re Multidimensior UNIT – V	eporting – Query tools and Applicatio nal Data Analysis. Trends in Mining	– Data ns – O	Extract	ion, C Analyti	leanup, ai ical Proce	nd Tran ssing (C	DLAP) –	OLAP and
Metadata – re Multidimension UNIT – V Mining of Comp Databases, Wor	eporting – Query tools and Applicatio nal Data Analysis.	– Data ns – O timedia Data M	Extract nline Databa ining.	ion, C Analyti ases, Ti <b>Case Si</b>	leanup, ai ical Proce ime Series t <b>udies:</b> Dat	nd Tran ssing (C and Sec a Minir	DLAP) – Juence D g Techn	OLAP and OLAP and Hours: 09 Data, Text iques for
Metadata – re Multidimension UNIT – V Mining of Comp Databases, Wor Optimizing Inve Total contact H	eporting – Query tools and Applicational Data Analysis. Trends in Mining olex Data Objects, Spatial Databases, Mul rld Wide Web, Applications and Trends in entories for Electronic Commerce, Crime I	– Data ns – O timedia Data M	Extract nline Databa ining. ( ning, Re	ion, C Analyti ases, Ti <b>Case Si</b> etailing	leanup, ai ical Proce ime Series tudies: Da g Bank Cus	nd Tran ssing (C and Sec a Minir	DLAP) – quence [ g Techn sttrition ]	OLAP and OLAP and Hours: 09 Data, Text iques for
Metadata – re Multidimension UNIT – V Mining of Comp Databases, Wor Optimizing Inve Total contact H Text Books:	eporting – Query tools and Applicational Data Analysis. Trends in Mining plex Data Objects, Spatial Databases, Mul rld Wide Web, Applications and Trends in entories for Electronic Commerce, Crime I lours: 45 Total Tutorials: 15 To	- Data ns – O timedia Data Min Data Min <b>tal Prac</b>	Extract nline Databa ining, for hing, Ro <b>tical C</b>	cion, C Analyti ases, Ti <b>Case Si</b> etailing <b>lasses:</b>	leanup, an ical Proce ime Series t <b>udies:</b> Dat g Bank Cus - <b>To</b>	and Tran ssing (C and Sec a Minir tomer A tal Hou	DLAP) – quence E g Techn attrition rs: 60	OLAP and OLAP and Hours: 09 Data, Text iques for Analysis.
Metadata – re Multidimension UNIT – V Mining of Comp Databases, Wor Optimizing Inve Total contact H Text Books: 1. Jiawei	eporting – Query tools and Applicational Data Analysis.          Trends in Mining         olex Data Objects, Spatial Databases, Mul         rld Wide Web, Applications and Trends in         entories for Electronic Commerce, Crime I         lours: 45       Total Tutorials: 15         Han and Micheline Kamber , Data Mir	- Data ns – O timedia Data Min Data Min <b>tal Prac</b>	Extract nline Databa ining, for hing, Ro <b>tical C</b>	cion, C Analyti ases, Ti <b>Case Si</b> etailing <b>lasses:</b>	leanup, an ical Proce ime Series t <b>udies:</b> Dat g Bank Cus - <b>To</b>	and Tran ssing (C and Sec a Minir tomer A tal Hou	DLAP) – quence E g Techn attrition rs: 60	OLAP and OLAP and Hours: 09 Data, Text iques for Analysis.
Metadata – re Multidimension UNIT – V Mining of Comp Databases, Wor Optimizing Inve Total contact H Text Books: 1. Jiawei Reprint 2. Alex Bo Tenth R	eporting – Query tools and Applicational Data Analysis.          Trends in Mining         olex Data Objects, Spatial Databases, Mul         rld Wide Web, Applications and Trends in         entories for Electronic Commerce, Crime I         lours: 45       Total Tutorials: 15         Han and Micheline Kamber , Data Mir         ted 2008.         erson and Stephen J. Smith,Data Wareho         Reprint 2007.	- Data ns – O timedia Data Min Data Min Data Prac	Extract nline Databa ining, Ro tical Cl incepts Data N	ion, C Analyti asses, Ti <b>Case S</b> f etailing and To lining a	ime Series tudies: Dat g Bank Cus - To echniques, & OLAP , 1	and Tran ssing (C and Sec a Minir tomer A tal Hou Second	DLAP) – quence E g Techn Attrition rs: 60 d Editior Graw –	OLAP and OLAP and Data, Text iques for Analysis.
Metadata – re Multidimension UNIT – V Mining of Comp Databases, Wor Optimizing Inver Total contact H Text Books: 1. Jiawei Reprint 2. Alex Bo Tenth R 3. G. K. Gu 2006.	eporting – Query tools and Applicational Data Analysis.          Trends in Mining         olex Data Objects, Spatial Databases, Mularld Wide Web, Applications and Trends in the entories for Electronic Commerce, Crime I         lours: 45       Total Tutorials: 15         Han and Micheline Kamber , Data Mir and Stephen J. Smith, Data Wareho	- Data ns – O timedia Data Min Data Min Data Prac	Extract nline Databa ining, R ning, R tical C ncepts Data M ies , Ea	ases, Ti Case St Case	leanup, an ical Proce ime Series tudies: Dat g Bank Cus - To echniques, & OLAP , 1 conomy Ed	and Tran ssing (C and Sec a Minir tomer A tal Hou Second Tata Mc ition, Pr	DLAP) – quence E g Techn Attrition rs: 60 d Edition Graw – rentice F	OLAP and OLAP and Hours: 09 Data, Text iques for Analysis. n, Elsevier, Hill Edition, Hall of India,
Metadata – re Multidimension UNIT – V Mining of Comp Databases, Wor Optimizing Inve Total contact H Text Books: 1. Jiawei Reprint 2. Alex Bo Tenth R 3. G. K. Gu 2006. 4. K.P. So Edition,	eporting – Query tools and Applicational Data Analysis. Trends in Mining plex Data Objects, Spatial Databases, Mul rld Wide Web, Applications and Trends in entories for Electronic Commerce, Crime I lours: 45 Total Tutorials: 15 To Han and Micheline Kamber , Data Mir erson and Stephen J. Smith,Data Wareho Reprint 2007. upta ,Introduction to Data Mining with Ca man, Shyam Diwakar and V. Ajay ,Insigh , Prentice Hall of India, 2006.	- Data ns – O timedia Data Min Data Min Data Prac	Extract nline Databa ining, R ning, R tical C ncepts Data M ies , Ea	ases, Ti Case St Case	leanup, an ical Proce ime Series tudies: Dat g Bank Cus - To echniques, & OLAP , 1 conomy Ed	and Tran ssing (C and Sec a Minir tomer A tal Hou Second Tata Mc ition, Pr	DLAP) – quence E g Techn Attrition rs: 60 d Edition Graw – rentice F	OLAP and OLAP and Hours: 09 Data, Text iques for Analysis. n, Elsevier, Hill Edition, Hall of India,
Metadata – re Multidimension UNIT – V Mining of Comp Databases, Wor Optimizing Inver Total contact H Text Books: 1. Jiawei Reprint 2. Alex Bo Tenth R 3. G. K. Gu 2006. 4. K.P. So Edition, Reference Bool	eporting – Query tools and Applicational Data Analysis. Trends in Mining plex Data Objects, Spatial Databases, Mul rld Wide Web, Applications and Trends in entories for Electronic Commerce, Crime I lours: 45 Total Tutorials: 15 To Han and Micheline Kamber , Data Mir erson and Stephen J. Smith,Data Wareho Reprint 2007. upta ,Introduction to Data Mining with Ca man, Shyam Diwakar and V. Ajay ,Insigh , Prentice Hall of India, 2006.	- Data ns – O timedia Data Min Data Min Data Min Data Prac	Extract nline Databa ining, R ning, R tical Cl ncepts Data M ies , Ea ata mi	ion, C Analyti ases, Ti <b>Case Si</b> etailing and To ining a ster Ec	leanup, an ical Proce ime Series tudies: Dat g Bank Cus - To echniques, & OLAP , 1 conomy Ed heory and	and Tran ssing (C and Sec a Minir tomer A tal Hou Second Tata Mc ition, Pr Practic	DLAP) – Juence E Jug Techn Attrition rs: 60 d Edition Graw – rentice F e , Easte	OLAP and OLAP and Hours: 09 Data, Text iques for Analysis. n, Elsevier, Hill Edition, Hall of India, er Economy

#### 2007

- 4. 4. Sam Anahory and Dennis Murray, Data Warehousing in the real world, Addison Wesley 2003.
- 5. 5. Bing Liu. Sentiment Analysis and Opinion Mining, Morgan & Claypool Publishers, May 2012.

Websit	tes:
1.	http://web.engr.illinois.edu/~hanj/bk2/datamining concepts
2.	http://www.cs.waikato.ac.nz/ml/weka/data mining software in java
3.	http://datawarehouse4u.info/
1	http://dota.warehouses.pot/architecture/

- 4.
- http://data-warehouses.net/architecture/ 5. http://www.cis.syr.edu/~hhuang13/cis600/notes.html

•	omputer Scie	ence and Engineering				ch. (Distril	Suled Sy	stems)	
Semester :			Catego	-	:TY	1	1		
Subject Code	Subject		Hou	rs / W	eek	Credit	Ma	iximum	Marks
Subject code	Jubjeet		L	Т	Р	С	CA	SE	ТМ
CSE60	Multi core	Programming	3	1	-	4	40	60	100
Prerequisite	<ul> <li>Pai</li> </ul>	rallel Computing							
Objectives	• Un	derstand the challenges	in parallel and	l mult	i-threa	ded progra	amming.		
Objectives	• Lea	arn about the various par	rallel program	ming	paradig	gms, and so	olutions.		
	On success	ful completion of the cou	urse, students	will b	e able	to:			
	• De	velop Program for Parall	el Processors.						
Outcome	• De	evelop programs using Op	penMP and M	PI.					
	• Co	mpare and contrast p	programming	for s	serial	processors	and p	orogram	ming fo
	pai	rallel processors							
UNIT – I	Introductio	on to Parallel Computing	5						Hours: 0
Single core to N	Multi-core ar	rchitectures – SIMD and	MIMD syster	ns – I	nterco	nnection r	networks	s - Symr	netric an
Distributed Sha	red Memory	y Architectures – Cache	coherence –	Perfo	rmanc	e Issues -	- Paralle	l progra	m desigi
Performance –	Scalability –	Synchronization and dat	ta sharing – D	ata ra	ces – S	ynchroniz	ation pri	mitives	(mutexe
locks, semapho	res, barriers	s) – deadlocks and livelo	ocks – comm	unicat	ion bet	ween three	eads (co	ndition	variable
signals, message	e queues and	d pipes							
UNIT – II	Shared-Me	emory Programming with	h Pthreads						Hours: 0
Processes, Thre	ads, and Pt	hreads – Execution of t	threads - Mat	rix-Ve	ctor N	Iultiplicati	on- Crit	ical Sect	ions-Bus
waiting – mute>	kes - Produce	er-Consumer Synchroniza	ation and Sem	aphor	es- Bar	riers and (	Conditio	n Variab	les- Read
Write Locks- Ca	ches, Cache (	Coherence, and False Sha	aring- Thread-	Safety	/				
UNIT – III	Shared Me	mory Programming with	n OpenMP						Hours: 0
OpenMP Execut	tion Model –	- Memory Model – Open	MP Directives	– Wo	ork-sha	ring Const	ructs – L	ibrary fu	unctions
Handling Data a	nd Functiona	al Parallelism – Handling	Loops – Perfo	rmano	ce Cons	siderations	5		
UNIT – IV	Distributed	d Memory Programming	with MPI						Hours: 0
MPI program e	execution –	MPI constructs – librar	ies – MPI se	nd an	id rece	eive – Poi	nt-to-po	int and	Collectiv
communication	– MPI derive	ed datatypes – Performa	nce evaluatio	າ.					
UNIT – V	Parallel Pro	ogram Development							Hours: 0
Case studies – r	-Body solver	rs – Tree Search – OpenN	/IP and MPI im	plem	entatio	ns and cor	nparisor	າ.	
Total contact H	ours: 45	Total Tutorials: 15	Total Pract	ical Cla	asses:-	То	tal Hour	rs: 60	
Text Books:									
1. 1. Peter	S. Pacheco,	An Introduction to Paral	lel Programmi	ng, M	organ-	Kauffman,	'Elsevier	, 2011.	
2. Darryl G	Gove, Multic	ore Application Program	ming for Wind	lows,	Linux, a	and Oracle	Solaris,	Pearsor	n, 2011
Reference Book									
		rallel programming in C		•				03	
	em Akhter an	nd Jason Roberts, Multi-c	core Program	ning ,	Intel P	ress, 2006			
Websites:									
•	vww.openm								
<b>7</b> h++m.//.	vww.nptel.a	c in							
	•	C.III							
3. https://	gcc.gnu.org vww.open-m								

-	omputer Scie	nce and Engineering				h. (Distribu	uted Sys	tems)	
Semester :	İ		Catego	•	: TY	<b>a !</b>	T		
Subject Code	Subject		Hou	rs / Wo	еек Р	Credit C		ximum N SE	TM
CSE61	Ad hoc and	Sensor Networks	3	1	-	4	40	60	100
Prerequisite	-						11		
Objectives	• To (	study the applications of understand the specific design energy efficient a familiarize about the tax	challenges in p and QoS aware	rotoco protoc	cols				
Outcome	Des     Eva	ful completion of the cou sign their own protocol a luate the performance t sign energy-efficient pro	at any stack hrough experir	nents	and sir				
UNIT – I								Н	ours: 09
security – Powe UNIT – II Routing in Ad h	r managemer  oc Networks:	and Exposed Terminal I nt – QoS provisioning. Topology and Position	based approac	hes – I	proacti	ive and rea	active pr	He otocols -	ours: 09 - Hybrid
	-	Routing – Power Aware ng – TCP over MANETs –	-		-	-		aware Ro	outing -
UNIT – III		ig - TCF OVEL MAINETS -		icapsu		- runnenn	ig.	Н	ours: 09
	/IAC – WPAN	Architecture – Channel A s – Bluetooth – Piconet riptions.	-						
UNIT – IV		<u>·</u>						Н	ours: 09
Introduction to	Wireless Ser	nsor Networks: Applicat	tions – Radio (	Charad	teristi	cs – Energ	gy consti	raints - N	MANET
		architecture – Berkeley				•	•	•	
		ng – MAC protocols for							
	-	Issues – TinyOS – TOSSI	M - Multichan	nel W	SNs – (	Case Study	: Develo	opment c	of Hom
Automation Sys	tem.								
UNIT – V					In	ing David	<b>.</b>		ours: 09
• •					ograpn	ucal Rolltir		isport Pro	
Docign issues		- Directed Diffusion - PE					-	•	otocol -
-	- CODA – ES	GRT – RMST – GARUDA	A – PSFQ – A	TP — 1	Franspo	ort protoc	ol perfo	ormance	otocol · – WSI
middleware – N	- CODA – ES 1iddleware Li	GRT – RMST – GARUDA nking MiLAN – Middlew	A – PSFQ – A <sup>-</sup> are Service for	TP – 1 Monit	Franspo coring (	ort protoc (MSM) – C	ol perfo	ormance	otocol - – WSN
middleware – M Middleware Fra	- CODA – ES 1iddleware Li mework (CLN	RT – RMST – GARUDA nking MiLAN – Middlew ЛF) – WSN security – Act	A – PSFQ – A are Service for tuators – Contr	TP – 1 Monit olled e	Transpo coring ( enviror	ort protoc (MSM) – C iment.	col perfo luster ba	ormance ased light	otocol - – WSN
middleware – N Middleware Fra Total contact H	- CODA – ES 1iddleware Li mework (CLN	GRT – RMST – GARUDA nking MiLAN – Middlew	A – PSFQ – A <sup>-</sup> are Service for	TP – 1 Monit olled e	Transpo coring ( enviror	ort protoc (MSM) – C iment.	ol perfo	ormance ased light	otocol - – WSN
middleware – N Middleware Fra Total contact H Text Books: 1. Carlos Applica 2. Kazem Applica	- CODA – ES iddleware Li mework (CLN ours: 45 de Morais C tions , 2nd Ed Sohraby, Da tions , 1st Edi	RT – RMST – GARUDA nking MiLAN – Middlew ЛF) – WSN security – Act	A – PSFQ – A are Service for tuators – Contr Total Practic ash Agrawal, sity Press, 2012	TP – 1 Monit olled e cal Cla Ad F 1	Franspo coring ( enviror sses: - loc an	ort protoc (MSM) – C nment. <b>Tota</b> d Sensor	iol perfo luster ba al Hours Networ	<b>: 60</b> ks: Theo	otocol - – WSN weigh ory and
middleware – N Middleware Fra Total contact H Text Books: 1. Carlos Applica 2. Kazem Applica Reference Book	- CODA – ES iddleware Li mework (CLN ours: 45 de Morais C tions , 2nd Ed Sohraby, Da tions , 1st Edi ss:	RT – RMST – GARUDA nking MiLAN – Middlew AF) – WSN security – Act <b>Total Tutorials: 15</b> Cordeiro, Dharma Praka ition, Cambridge Univer niel Minoli, Taieb, Zna tion, John-Wiley & Sons,	A – PSFQ – A are Service for tuators – Contr <b>Total Practi</b> ash Agrawal, rsity Press, 2012 ati, Wireless , 2007.	TP – 1 Monit olled e cal Cla Ad H 1 Senso	Franspo coring ( enviror sses: - loc an r Netv	ort protoc (MSM) – C ment. <b>Tota</b> d Sensor vorks: Tec	ol perfo luster ba al Hours Networ	<b>: 60</b> ks: Theo	otocol – WSI weigh ory and ols and
middleware – N Middleware Fra Total contact H Text Books: 1. Carlos Applica 2. Kazem Applica Reference Book 1. C. Siva	- CODA – ES Aiddleware Li mework (CLN ours: 45 de Morais C tions , 2nd Ed Sohraby, Da tions , 1st Edi (s: Ram Murthy,	SRT – RMST – GARUDA nking MiLAN – Middlew AF) – WSN security – Act <b>Total Tutorials: 15</b> Cordeiro, Dharma Praka ition, Cambridge Univer niel Minoli, Taieb, Zna tion, John-Wiley & Sons, , B. S. Manoj, Ad Hoc V	A – PSFQ – A are Service for tuators – Contr <b>Total Practi</b> ash Agrawal, rsity Press, 2012 ati, Wireless , 2007.	TP – 1 Monit olled e cal Cla Ad H 1 Senso	Franspo coring ( enviror sses: - loc an r Netv	ort protoc (MSM) – C ment. <b>Tota</b> d Sensor vorks: Tec	ol perfo luster ba al Hours Networ	<b>: 60</b> ks: Theo	otocol – WSI weigh ory and ols and
middleware – N Middleware Fra Total contact H Text Books: 1. Carlos Applica 2. Kazem Applica Reference Book 1. C. Siva Pearsor 2. Srikanta	- CODA – ES Aiddleware Li mework (CLM ours: 45 – – – – – – – – – – – – – – – – – –	SRT – RMST – GARUDA nking MiLAN – Middlew AF) – WSN security – Act <b>Total Tutorials: 15</b> Cordeiro, Dharma Praka ition, Cambridge Univer niel Minoli, Taieb, Zna tion, John-Wiley & Sons, , B. S. Manoj, Ad Hoc V	A – PSFQ – A are Service for tuators – Contr Total Practic ash Agrawal, sity Press, 2012 ati, Wireless , 2007.	TP – 1 Monit olled e cal Cla Ad F 1 Senso	Franspo coring ( enviror sses: - foc an r Netv	ort protoc (MSM) – C ment. <b>Tota</b> d Sensor vorks: Tec	al Hours Networ	ks: Theo orks: Theo ols , 1st	otocol – WSI : weigh ory and ols an Edition
middleware – N Middleware Fra Total contact H Text Books: 1. Carlos Applica 2. Kazem Applica Reference Book 1. C. Siva Pearsor 2. Srikanta	- CODA – ES Aiddleware Li mework (CLM ours: 45 – – – – – – – – – – – – – – – – – –	RT – RMST – GARUDA nking MiLAN – Middlew AF) – WSN security – Act <b>Total Tutorials: 15</b> Cordeiro, Dharma Praka ition, Cambridge Univer niel Minoli, Taieb, Zna tion, John-Wiley & Sons, , B. S. Manoj, Ad Hoc M 2004. aolong Li, Yeon-Mo Ya	A – PSFQ – A are Service for tuators – Contr Total Practic ash Agrawal, sity Press, 2012 ati, Wireless , 2007.	TP – 1 Monit olled e cal Cla Ad F 1 Senso	Franspo coring ( enviror sses: - foc an r Netv	ort protoc (MSM) – C ment. Tota d Sensor vorks: Tec ctures and	al Hours Networ	ks: Theo orks: Theo ols , 1st	otocol – WSI : weigh ory and ols and Edition
middleware – N Middleware Fra Total contact H Text Books: 1. Carlos Applica 2. Kazem Applica Reference Book 1. C. Siva Pearsor 2. Srikanta Networ Websites: 1. Autono	- CODA – ES Aiddleware Li mework (CLM ours: 45 de Morais C tions , 2nd Ed Sohraby, Da tions , 1st Edi ss: Ram Murthy, a Patnaik, Xia ks , 1st Editio mous Netw	RT – RMST – GARUDA nking MiLAN – Middlew AF) – WSN security – Act <b>Total Tutorials: 15</b> Cordeiro, Dharma Praka ition, Cambridge Univer niel Minoli, Taieb, Zna tion, John-Wiley & Sons, B. S. Manoj, Ad Hoc M 2004. aolong Li, Yeon-Mo Ya n, Springer-India, 2015	A – PSFQ – A are Service for tuators – Contr <b>Total Practi</b> ash Agrawal, sity Press, 2012 ati, Wireless , 2007. Wireless Netwo	TP – 1 Monit olled e cal Cla Ad F 1 Senso orks: A	Franspo coring ( enviror sses: - loc an r Netv Archite pment	ort protoc (MSM) – C ment. Tota d Sensor vorks: Tec ctures and t in Wirele	al Hours Networ	<b>60</b> ks: Theo r, Protoco ols , 1st	otocol – WSI : weigh ory and ols and Edition Ad Ho
middleware – N Middleware Fra Total contact H Text Books: 1. Carlos Applica 2. Kazem Applica Reference Book 1. C. Siva Pearsor 2. Srikanta Networ Websites: 1. Autono https:// 2. Researc	- CODA – ES Aiddleware Li mework (CLN ours: 45 de Morais C tions , 2nd Ed Sohraby, Da tions , 1st Edir (s: Ram Murthy, a Patnaik, Xia ks , 1st Editio mous Netwanrg.usc.edu ch publicatio	RT – RMST – GARUDA nking MiLAN – Middlew AF) – WSN security – Act <b>Total Tutorials: 15</b> Cordeiro, Dharma Praka ition, Cambridge Univer niel Minoli, Taieb, Zna tion, John-Wiley & Sons, B. S. Manoj, Ad Hoc M 2004. aolong Li, Yeon-Mo Ya n, Springer-India, 2015	A – PSFQ – A are Service for tuators – Contr <b>Total Practi</b> ash Agrawal, sity Press, 2012 ati, Wireless , 2007. Wireless Netwo ang, Recent D up, Universit kyildiz, Georg	TP – 1 Monit olled e cal Cla Ad F 1 Senso orks: A Develo y of gia Ir	Franspo coring ( enviror sses: - floc an r Netv Archite pment Sout	ort protoc (MSM) – C ment. Tota d Sensor vorks: Tec ctures and thern Ca	A Protoco	<b>60</b> ks: Theo , Protoco ols , 1st sor and availa	otocol – WSI : weigh ory and ols and Edition Ad Ho

<b>C</b>	omputer Science and Engineering			1.Tech. (		e o you con	137	
Semester :		Catego	<b>y :⊺</b>	Ϋ́				
Subject Code	Subject	Но	urs / Wo	eek	Credit	Max	imum N	1arks
Subject Code	Subject	L	Т	Р	С	CA	SE	ТМ
CSE62	Network Management Systems	3	1	-	4	40	60	100
Prerequisite	-							
Objectives	<ul> <li>Understand general concernanagement.</li> <li>Understand concepts and ter</li> <li>Get a feeling of current trend</li> <li>Understand Technologies us</li> </ul>	rminology a ds in networ	ssociate k mana	ed with S gement	SNMP and Technologi	ΓMN.	ased n	etwork
Outcome	On successful completion of the court Develop a clear understandir Understand clearly SNMP ve Understand the tools and ab	rse, student ng of netwo rsions 1 and le to manag	s will be rk mana 2, with e the ne	e able to agement TMN. etwork u	:	based NI	1	
UNIT – I	Data Communications and Network							ours: 09
Networking and Organization, an	lephone Network Management,Com d Management, Challenges ofInformand Functions, Network and System Ma e of Network Management.	tion Techn	ology N	lanager	s, Network	Manag	gement:	Goals,
UNIT – II	SNMPV1 Network Management						Ho	ours: 09
Model.SNMPv1 Model,Function UNIT – III Major Changes SNMPv2 Manag	NMP Management, The SNMP Model, Network Management: Communica al model. SNMP Management: SNMPV2 and F in SNMPv2, SNMPv2 System Archi gement Information Base, SNMPv2 P MIB, RMON1, RMON2 - A Case Study o	tion and F RMON tecture, SN rotocol, Co	unction MPv2 mpatibi	al Mod Structur lity with	els. The S e of Man SNMPv1.	agemen	Commur Ho It Inforr	nication ours: 09 mation,
UNIT – IV	Telecommunications Management I			-		sand	Но	ours: 09
	Systems			manage		Juna		
	perations Systems,TMN Conceptual M	adal TNANI						
Network Mana	ture, An Integrated View of TMN,I mpl gement Tools, Network Statistics M gement systems, Commercial Networ	ementation easurement	Issues. Syster	ns, Hist	ory of Ent	erprise	Manag	ement,
Network Mana Network Mana	ture, An Integrated View of TMN,I mpl gement Tools, Network Statistics M gement systems, Commercial Networ	ementation easurement	Issues. Syster	ns, Hist	ory of Ent	erprise	Manag ent, Ent	ement,
Network Mana Network Mana Management So <b>UNIT – V</b> NMS with Web Based Manager Management Ir Direction.	ture, An Integrated View of TMN,I mpl gement Tools, Network Statistics M gement systems, Commercial Networ olutions. Web-Based Management Interface and Web-Based Management ment, Desktop management Interfac astrumentation,Java management Extern	ementation easurement k managen nt, Web Int e, Web-Bas ensions, Ma	Issues. Syster nent Sy erface ed Ent nagemo	ns, Hist stems, to SNMI erprise ent of a	ory of Ent System Ma P Managem Manageme Storage A	erprise anageme nent, Er ent, WE rea Net	Manag ent, Ent Hc nbeddeo BEM: W twork: ,	ement, erprise ours: 09 d Web- indows
Network Mana Network Mana Management So UNIT – V NMS with Web Based Management In Direction. Total contact He	ture, An Integrated View of TMN,I mpl gement Tools, Network Statistics M gement systems, Commercial Networ olutions. Web-Based Management Interface and Web-Based Management ment, Desktop management Interfac astrumentation,Java management Extern	ementation easurement rk managen nt, Web Int e, Web-Bas	Issues. Syster nent Sy erface ed Ent nagemo	ns, Hist stems, to SNMI erprise ent of a	ory of Ent System Ma P Managem Manageme Storage A	cerprise anageme nent, Er ent, WE	Manag ent, Ent Hc nbeddeo BEM: W twork: ,	ement, erprise ours: 09 d Web indows
Network Mana Network Mana Management So UNIT – V NMS with Web Based Manager Management Ir Direction. Total contact He Text Books:	ture, An Integrated View of TMN,I mpl gement Tools, Network Statistics M gement systems, Commercial Networ olutions. Web-Based Management Interface and Web-Based Manageme ment, Desktop management Interfac instrumentation,Java management Exter ours: 45 Total Tutorials: 15	ementation easurement rk managen nt, Web Int e, Web-Bas ensions, Ma Total Pra	Issues. Syster nent Sy erface ed Ent nagemo ctical C	ns, Hist stems, s to SNMI erprise ent of a <b>lasses:</b> -	P Manageme System Ma P Manageme Storage A	nent, Er ent, WE rea Net	Manag ent, Ent hbeddeo BEM: W twork: ,	ement erprise ours: 09 d Web
Network Mana Network Mana Management So UNIT – V NMS with Web Based Manager Management In Direction. Total contact He Text Books: 1. Mani Su	iture, An Integrated View of TMN,I mpl gement Tools, Network Statistics M gement systems, Commercial Networ olutions. Web-Based Management Interface and Web-Based Management ment, Desktop management Interfac instrumentation,Java management Externo ours: 45 Total Tutorials: 15	ementation easurement rk managen nt, Web Int e, Web-Bas ensions, Ma Total Pra	Issues. Syster nent Sy erface ed Ent nagemo ctical C	ns, Hist stems, s to SNMI erprise ent of a <b>lasses:</b> -	P Manageme System Ma P Manageme Storage A	nent, Er ent, WE rea Net	Manag ent, Ent hbeddeo BEM: W twork: ,	ement, erprise ours: 09 d Web indows
Network Mana Network Mana Management So UNIT – V NMS with Web Based Manager Management Ir Direction. Total contact Ho Text Books: 1. Mani Su Reference Book	iture, An Integrated View of TMN,I mpl gement Tools, Network Statistics M gement systems, Commercial Networ olutions. Web-Based Management Interface and Web-Based Management ment, Desktop management Interfac instrumentation,Java management Externo ours: 45 Total Tutorials: 15	ementation easurement rk managen nt, Web Int e, Web-Bas ensions, Ma <b>Total Pra</b> inciples and cepts and Pi	Issues. Syster nent Sy erface ed Ent nagemo ctical C Practice:	ns, Hist stems, s to SNMI erprise ent of a lasses: - e , Pears A Hands	P Manageme Manageme Storage A Storage A Son Educati	erprise anageme nent, Er ent, WE rea Net tal Hour on, 2010	Manag ent, Ent nbeddee BEM: W twork: , rs: 60	ement erprise ours: 09 d Web
Network Mana Network Mana Management So UNIT – V NMS with Web Based Manager Management Ir Direction. Total contact He Text Books: 1. Mani Su Reference Book 1. J. Richar	iture, An Integrated View of TMN,I mpl gement Tools, Network Statistics M gement systems, Commercial Networ olutions. Web-Based Management Interface and Web-Based Management ment, Desktop management Interface instrumentation,Java management Externation ours: 45 Total Tutorials: 15 Ibramanian, Network Management, Pr is: rd Burke, Network Management–Con	ementation easurement rk managen nt, Web Int e, Web-Bas ensions, Ma <b>Total Pra</b> inciples and cepts and Pi	Issues. Syster nent Sy erface ed Ent nagemo ctical C Practice:	ns, Hist stems, s to SNMI erprise ent of a lasses: - e , Pears A Hands	P Manageme Manageme Storage A Storage A Son Educati	erprise anageme nent, Er ent, WE rea Net tal Hour on, 2010	Manag ent, Ent nbeddee BEM: W twork: , rs: 60	ement erprise ours: 09 d Web

Department : Co	omputer Scier	nce and Engineering	Prog			(Distribute	d Syster	ns)	
Semester :			Cate		: TY				
Subject Code	Subject		н	ours / V	Veek	Credit	Max	imum N	larks
-	-		L	Т	Р	С	CA	SE	TM
CSE63	Search Eng	ine Optimization	3	1	-	4	40	60	100
Prerequisite	-								
		uire a knowhow to opti							
Objectives	Get	t an overview of various	important	earch e	engines ar	nd directori	es.		
		ow about web design el				-	e compa	tible.	
	On success	ful completion of the co	urse, stude	nts will l	be able to	:			
Outcome	• Kno	owledge about good Sea	arch keywor	ds to ge	t optimiz	ed search.			
	• Kno	owledge about how to d	lesign web p	age so	as to get	top page ra	ink.		
UNIT – I	Search Eng	gine Basics						Ηοι	urs: 09
-	•	tance of Internet Mark	-	•			-		-
•	•	Basic Understanding of	-	•	-	irch Engine	Archite	cture	Search
Engine Algorithr	ns and their L	Jpdates - Page Rank Tec	hnology - W	eb Mas	ters Tool				
UNIT – II	Keywords								urs: 09
		search -Business Analy				•			
Keywords Analy	sis Tools-Com	petition Analysis-Prepa	ring a Keyw	ord List	for Projec	t -Localized	l Keywo	rds Rese	earch
UNIT – III	On-Page O	ptimization						Но	urs: 09
Website Designi	ng and Devel	opment Basics: HTML b	based <b>SEO</b> B	asics-Ba	sics of Or	nsite Optim	ization -	Importa	ance of
Domain Names	and their Sele	ection - Optimization of	Website St	ructure	and Navi	gation Mer	u - Filer	name ar	nd Title
Tag Optimizatio	n - Keyword	Research and Density	Analysis -	Knowle	dge of N	leta Tags a	and its (	Optimiz	ation ·
Content Optimiz	ation -Page S	peed and Anchor Links	Optimizatio	n - Hea	der and F	ooter Opti	mizatior	n – Cano	onical
Implementation	and many mo	ore							
UNIT – IV	Off Page O	ptimization						Но	urs: 09
Basic Introduction	on- Subseque	nt Promotion of Web Pa	ages - Direc	ory and	l Blog Sub	missions -	Link Bui	lding M	ethods
and Types - Free	Classifieds, F	orums, Press Releases,	Forum Sign	atures a	ind Comm	nenting - Sc	cial Boo	ok marki	ng and
Business Listing	-Classified Po	sting, Blog Commenting	g, Press Rel	ease an	d Article S	Submission	s -Video	and RS	S Feed
Submissions - Ba	sics of Social	Media Optimization (SN	ИО) -Link an	d Page	Rank Trac	king			
UNIT – V	SEO For Dy	namic Websites						Но	urs: 09
Difference betw	een Static ar	nd Dynamic Websites -	Search Eng	gine Op	timizatior	n for Word	Press -	Search	Engine
Optimization for	Joomla -Sear	rch Engine Optimization	for Blogspo	t- Opti	mization	of Flash We	bsites. 7	Traffic A	nalysis
-Use of Google A	Analytics - Tra	cking and Improving Co	nversions						
<b>Total contact Ho</b>	ours: 45	<b>Total Tutorials: 15</b>	Total Pra	ctical C	lasses: -	Total	Hours: 6	50	
Text Books:									
1. Introduc Hubspot		ch Engine Optimization	n - Getting	Starteo	d With S	EO to Ach	ieve Bu	siness (	Goals
Reference Book									
		zation Book, Aaron Mat	thow Wall						
	•	zation An Hour a Day, Je		none C	radiva Co		Dublichi	ng Inc	
		Engine Optimisation ,Da	•	•				ng IIIC.	
Websites:					pry clicks	June 2005			
websites:									
-									

C	computer scie	nce and Engi	heering			-	Distributed	- /	,	
Semester :	1			Catego	-					
Subject Code	Subject				urs / W	eek P	Credit		kimum	
CSE64	Text Data M	ining		L 3	<b>T</b>	Р	<b>C</b>	<b>CA</b> 40	<b>SE</b> 60	<b>TM</b> 100
Prerequisite	-	lillig		5		_	4	40	00	100
recquisite	• To a	ppreciate the	different	aspects of te	ext cate	orizatio	n and cluste	ering		
Objectives		nderstand th		-		-		-	extracti	on
Objectives		ppreciate the	• •	•	•					on
		ul completion					-			
		available ope						ndard te	ext data	sets
		lify existing o								
Outcome	used				,				incy of	i cutui co
		gn a system t	hat uses te	ext mining to	o impro	ve the fu	nctions of a	an existi	ing ope	n source
		ch engine.								
UNIT – I		f Text Mining	g						Н	ours: 09
Definition-Gene			-	Operations	–Pre-p	rocessin	g–Types d	of Prob	lems-b	asics of
document clas		-		•	•					
prediction and	d evaluation	-Textual inf	ormation	to numer	ical ve	ectors -	Collecting	docum	nents-d	ocument
standardization	-tokenization	-lemmatizatio	on-vector g	generation f	or pred	iction-se	ntence bou	undary (	determ	ination -
evaluation perf	ormance									
UNIT – II	Text Catego	orization and	Clustering						Н	ours: 09
Text Categoriza	ation –Definit	ion –Docume	ent Repres	entation –F	eature	Selectior	-Decision	Tree C	Classifie	rs -Rule-
based Classifier			•							
Meta-Algorithm					istance	-based A	lgorithms-\	Nord ar	nd Phra	se-based
Clustering -Sem			ansfer Lea	rning						
UNIT – III	Text Mining									
	_		ion Retriev	al and Info						ours: 09
Information ret	rieval and tex	t mining -key	ion Retriev	<b>val and Info</b> ch-nearest-n	eighboi	<sup>.</sup> method	s -similarit		ased d	ocument
Information ret search-matchin	rieval and tex g-inverted lis	t mining -key ts -evaluatior	<b>ion Retriev</b> word search. Informat	<b>val and Info</b> ch-nearest-n ion extractio	eighboi on -Arch	<sup>r</sup> method itecture	s -similarit –Co-refere	nce -Na	ased d Imed E	ocument ntity and
Information ret search-matchin Relation Extrac	rieval and tex g-inverted lis tion -Templat	t mining -key ts -evaluatior e filling and	ion Retriev word searc a. Informat database c	<b>val and Info</b> ch-nearest-n ion extractio construction	eighboi on -Arch Applica	r method litecture tions. In	s -similarit –Co-refere ductive -Ui	nce -Na nsuperv	based d Imed Ei Ised Al	ocument ntity and gorithms
Information ret search-matchin Relation Extrac for Information	rieval and tex g-inverted lis tion -Templat Extraction. T	t mining -key ts -evaluation e filling and ext Summaria	<b>ion Retrie</b> v word searc n. Informat database c zation Tech	<b>val and Info</b> ch-nearest-n ion extractic onstruction iniques -Top	eighboi on -Arch Applica ic Repr	method itecture tions. In esentatic	s -similarit –Co-refere ductive -Ui	nce -Na nsuperv	based d Imed Ei Ised Al	ocument ntity and gorithms
Information ret search-matchin Relation Extrac for Information Representation	rieval and tex g-inverted lis tion -Templat Extraction. T s -Pattern Ext	t mining -key ts -evaluation e filling and ext Summariz raction -Apric	<b>ion Retrie</b> v word searc n. Informat database c zation Tech	<b>val and Info</b> ch-nearest-n ion extractic onstruction iniques -Top	eighboi on -Arch Applica ic Repr	method itecture tions. In esentatic	s -similarit –Co-refere ductive -Ui	nce -Na nsuperv	based d Imed El Ised Al Intext -	ocument ntity and gorithms Indicator
Information ret search-matchin Relation Extrac for Information Representation <b>UNIT – IV</b>	rieval and tex g-inverted lis tion -Templat Extraction. T s -Pattern Ext <b>Probabilistic</b>	t mining -key ts -evaluation e filling and ext Summariz raction -Apric c <b>Models</b>	ion Retriev word searc n. Informat database c zation Tech pri Algorith	val and Infor ch-nearest-n ion extraction construction niques -Top m -FP Tree a	eighboi on -Arch Applica ic Repr ilgorithi	r method litecture tions. In esentatio m	s -similarit –Co-refere ductive -Ui on -Influenc	nce -Na nsuperv ce of Co	based d Imed Ei Ised Al Intext - <b>H</b>	ocument ntity and gorithms Indicator ours: 09
Information ret search-matchin Relation Extrac for Information Representation <b>UNIT – IV</b> Probabilistic M	rieval and tex g-inverted lis tion -Templat Extraction. T s -Pattern Ext <b>Probabilistic</b> odels for Text	t mining -key ts -evaluation e filling and ext Summariz raction -Apric c <b>Models</b> : Mining -Mix	ion Retriev word search Informat database c zation Tech pri Algorith sture Mode	val and Infor ch-nearest-n ion extraction onstruction iniques -Top m -FP Tree a els -Stochast	eighboi on -Arch Applica ic Repro ilgorithi	r method itecture tions. In esentatic n esses in I	s -similarit -Co-refere ductive -Ui on -Influenc Bayesian N	nce -Na nsuperv ce of Co onpara	based d Imed El Ised Al Intext - <b>H</b> metric	ocument ntity and gorithms Indicator <b>ours: 09</b> Models -
Information ret search-matchin Relation Extrac for Information Representation <b>UNIT – IV</b> Probabilistic M Graphical Mode	rieval and tex g-inverted lis tion -Templat Extraction. T s -Pattern Ext <b>Probabilistic</b> odels for Text els -Relations	t mining -key ts -evaluation e filling and ext Summaria raction -Aprice <b>Models</b> Mining -Mix hip Between	ion Retriev word search Informat database c zation Tech ori Algorith cture Mode Clustering,	val and Infor ch-nearest-n ion extraction onstruction miques -Top m -FP Tree a els -Stochast	eighbor on -Arch Applica ic Repro- ilgorithr ilgorithr ic Proce Reduct	method itecture tions. In esentatic m esses in I	s -similarit –Co-refere ductive -Ui on -Influenc Bayesian N Topic Moc	nce -Na nsuperv ce of Co onparar deling -L	oased d imed Ei ised Al ntext - <b>H</b> metric atent S	ocument ntity and gorithms Indicator <b>ours: 09</b> Models - Semantic
Information ret search-matchin Relation Extrac for Information Representation <b>UNIT – IV</b> Probabilistic M Graphical Mode Indexing -Prob	rieval and tex g-inverted lis tion -Templat Extraction. T s -Pattern Ext <b>Probabilistic</b> odels for Text els -Relations abilistic Later	t mining -key ts -evaluation e filling and ext Summariz raction -Apric <b>Models</b> Mining -Mix hip Between ht Semantic	ion Retriev word searc a. Informat database c zation Tech ori Algorith cture Mode Clustering, Indexing -	val and Infor ch-nearest-n ion extraction onstruction miques -Top m -FP Tree a els -Stochast Dimension Latent Diric	eighboi on -Arch Applica ic Repr ilgorithi ic Proce Reduct chlet Al	method itecture tions. In esentation m esses in I ion and location	s -similarit –Co-refere ductive -Ui on -Influend Bayesian N Topic Mod -Interpreta	once -Na nsuperv ce of Co onpara deling -L ation ar	pased d imed Ei ised Al ntext - <b>H</b> metric Latent S atent S	ocument ntity and gorithms Indicator <b>ours: 09</b> Models - Semantic Iuation -
Information ret search-matchin Relation Extrac for Information Representation <b>UNIT – IV</b> Probabilistic M Graphical Mode Indexing -Prob Probabilistic De	rieval and tex g-inverted lis tion -Templat Extraction. T s -Pattern Ext <b>Probabilisti</b> odels for Text els -Relations abilistic Later ocument Clus	t mining -key ts -evaluation e filling and ext Summariz raction -Apric <b>Models</b> Mining -Mix hip Between t Semantic tering and T	ion Retriev word search a. Informat database co zation Tech ori Algorith clustering, Indexing - copic Mode	val and Infor ch-nearest-n ion extraction onstruction iniques -Top m -FP Tree a els -Stochast Dimension Latent Diric	eighboi on -Arch Applica ic Repr ilgorithi ic Proce Reduct hlet Al listic M	r method itecture tions. In esentation m esses in I ion and location odels fo	s -similarit –Co-refere ductive -Ur on -Influenc Bayesian N Topic Moc -Interpreta r Informat	once -Na nsuperv ce of Co onpara deling -L ation ar ion Extr	pased d imed Ei ised Al ntext - <b>H</b> metric Latent S nd Eval raction	ocument ntity and gorithms Indicator <b>ours: 09</b> Models - Semantic luation - -Hidden
Information ret search-matchin Relation Extrac for Information Representation <b>UNIT – IV</b> Probabilistic M Graphical Mode Indexing -Prob Probabilistic De Markov Model	rieval and tex g-inverted lis tion -Templat Extraction. T s -Pattern Ext <b>Probabilistic</b> odels for Text els -Relations abilistic Later ocument Clus s -Stochastic	t mining -key ts -evaluation e filling and ext Summaria raction -Aprice <b>Models</b> Mining -Mix hip Between ht Semantic tering and T Context- Free	ion Retriev word search a. Informat database co zation Tech ori Algorith clustering, Indexing - copic Mode	val and Infor ch-nearest-n ion extraction onstruction iniques -Top m -FP Tree a els -Stochast Dimension Latent Diric	eighboi on -Arch Applica ic Repr ilgorithi ic Proce Reduct hlet Al listic M	r method itecture tions. In esentation m esses in I ion and location odels fo	s -similarit –Co-refere ductive -Ur on -Influenc Bayesian N Topic Moc -Interpreta r Informat	once -Na nsuperv ce of Co onpara deling -L ation ar ion Extr	pased d imed Ei ised Al ntext - <b>H</b> metric Latent S nd Eval raction	ocument ntity and gorithms Indicator <b>ours: 09</b> Models - Semantic luation - -Hidden
Information ret search-matchin Relation Extrac for Information Representation <b>UNIT – IV</b> Probabilistic M Graphical Mode Indexing -Prob Probabilistic Do Markov Model Models -Condit	rieval and tex g-inverted lis tion -Templat Extraction. T s -Pattern Ext <b>Probabilistic</b> odels for Text els -Relations abilistic Later ocument Clus s -Stochastic ional Random	t mining -key ts -evaluation e filling and ext Summariz raction -Apric <b>Models</b> Mining -Mix hip Between ht Semantic tering and T Context- Fre Fields	ion Retriev word search a. Informat database co zation Tech ori Algorith clustering, Indexing - copic Mode	val and Infor ch-nearest-n ion extraction onstruction iniques -Top m -FP Tree a els -Stochast Dimension Latent Diric	eighboi on -Arch Applica ic Repr ilgorithi ic Proce Reduct hlet Al listic M	r method itecture tions. In esentation m esses in I ion and location odels fo	s -similarit –Co-refere ductive -Ur on -Influenc Bayesian N Topic Moc -Interpreta r Informat	once -Na nsuperv ce of Co onpara deling -L ation ar ion Extr	pased d imed En ised Al intext - <b>H</b> metric Latent S and Eval raction Entropy	ocument ntity and gorithms Indicator <b>ours: 09</b> Models - Semantic luation - -Hidden Markov
Information ret search-matchin Relation Extrac for Information Representation <b>UNIT – IV</b> Probabilistic M Graphical Mode Indexing -Prob Probabilistic Do Markov Model Models -Condit <b>UNIT – V</b>	rieval and tex g-inverted lis- tion -Templat Extraction. T s -Pattern Ext Odels for Text odels for Text els -Relations abilistic Later ocument Clus s -Stochastic ional Random Recent Tren	t mining -key ts -evaluation e filling and o ext Summaria raction -Aprice <b>Models</b> Mining -Mix hip Between ht Semantic tering and T Context- Free Fields <b>ds</b>	ion Retriev word search a. Informat database of zation Tech ori Algorith sture Mode Clustering, Indexing - opic Mode ee Gramma	val and Infor ch-nearest-n ion extraction onstruction miques -Top m -FP Tree a els -Stochast Dimension Latent Diric els -Probabi ars - Maxim	eighboi on -Arch Applica ic Repr ilgorithi ic Proce Reduct hlet Al listic M nal Entr	method itecture tions. In esentation esses in I esses in I ion and location odels fo opy Mod	s -similarit -Co-refere ductive -Ui on -Influend Bayesian N Topic Moc -Interpreta r Informat deling -Ma	onparan deling -L ation ar ion Extr ximal E	pased d imed En ised Al intext - <b>H</b> metric Latent S nd Eval raction Entropy <b>H</b>	ocument ntity and gorithms Indicator <b>ours: 09</b> Models - Semantic luation - -Hidden Markov
Information ret search-matchin Relation Extract for Information Representation <b>UNIT – IV</b> Probabilistic M Graphical Model Indexing -Prob Probabilistic De Markov Model Models -Condit <b>UNIT – V</b> Visualization Ap	rieval and tex g-inverted lis- tion -Templat Extraction. T s -Pattern Ext <b>Probabilistic</b> odels for Text els -Relations abilistic Later ocument Clus s -Stochastic ional Random <b>Recent Tren</b> oproaches -Ar	t mining -key ts -evaluation e filling and ext Summaria raction -Aprice <b>Models</b> Mining -Mix hip Between ht Semantic tering and T Context- Free Fields ds chitectural Co	ion Retriev word search a. Informat database of zation Tech ori Algorith cture Mode Clustering, Indexing - opic Mode ee Gramma	val and Infor ch-nearest-n ion extraction onstruction miques -Top m -FP Tree a els -Stochast Dimension Latent Diric els -Probabi ars - Maxim	eighboi on -Arch Applica ic Repr ilgorithi ic Proce Reduct hlet Al listic M nal Entr	method itecture tions. In essentation esses in I ion and location odels fo opy Moo	s -similarit –Co-refere ductive -Ui on -Influend Bayesian N Topic Mod -Interpreta r Informat deling -Ma s in Link An	onparan deling -L ation ar ion Extr iximal E	pased d imed Ei ised Al intext - <b>H</b> metric Latent S ind Eval raction Entropy <b>H</b> Exampl	ocument ntity and gorithms Indicator Ours: 09 Models - Semantic luation - -Hidden Markov Ours: 09 e-Mining
Information ret search-matchin Relation Extract for Information Representation UNIT – IV Probabilistic M Graphical Model Indexing -Prob Probabilistic Do Markov Model Models -Condit UNIT – V Visualization Ap Text Streams -T	rieval and tex g-inverted lis tion -Templat Extraction. T s -Pattern Ext <b>Probabilistic</b> odels for Text els -Relations abilistic Later ocument Clus s -Stochastic ional Random <b>Recent Tren</b> oproaches -Ar	t mining -key ts -evaluation e filling and ext Summaria raction -Aprice <b>Models</b> Mining -Mix hip Between t Semantic tering and T Context- Free Fields ds chitectural Co Multimedia	ion Retriev word search a. Informat database of zation Tech ori Algorith dure Mode Clustering, Indexing - opic Mode ee Gramma onsideratio -Text Analy	val and Infor ch-nearest-n ion extraction onstruction miques -Top m -FP Tree a els -Stochast Dimension Latent Diric els -Probabi ars - Maxim	eighboi on -Arch Applica ic Repr ilgorithi ic Proce Reduct hlet Al listic M nal Entr ation Te	method itecture tions. In essentation esses in I ion and location odels fo opy Mod	s -similarit –Co-refere ductive -Ui on -Influend Bayesian N Topic Moc -Interpreta r Informat deling -Ma s in Link An n Mining an	once -Na nsuperv ce of Co onparar deling -L ation ar ion Extr ximal E nalysis -I nalysis -I	pased d imed El ised Al ntext - <b>H</b> metric Latent S nd Eval raction intropy <b>H</b> Exampl iment A	ocument ntity and gorithms Indicator <b>ours: 09</b> Models - Semantic luation - -Hidden Markov <b>ours: 09</b> e-Mining Analysis -
Information ret search-matchin Relation Extract for Information Representation <b>UNIT – IV</b> Probabilistic M Graphical Model Indexing -Prob Probabilistic De Markov Model Models -Condit <b>UNIT – V</b> Visualization Ap	rieval and tex g-inverted lis tion -Templat Extraction. T s -Pattern Ext Odels for Text odels for Text els -Relations abilistic Later ocument Clus s -Stochastic ional Random Recent Tren oproaches -Ar fext Mining in timent Classifi	t mining -key ts -evaluation e filling and o ext Summaria raction -Aprice <b>Models</b> Mining -Mix hip Between ht Semantic tering and T Context- Free Fields ds chitectural Co Multimedia cation -Opini	ion Retriev word search a. Informat database of zation Tech ori Algorith dure Mode Clustering, Indexing - opic Mode ee Gramma onsideratio -Text Analy on Lexicon	val and Infor ch-nearest-n ion extraction onstruction iniques -Top m -FP Tree a els -Stochast Dimension Latent Diric els -Probabi ars - Maxim ons -Visualiza /tics in Socia Expansion	eighboi on -Arch Applica ic Repr ilgorithi ic Proce Reduct hlet Al listic M nal Entr ation Te	method itecture tions. In essentation esses in I ion and location odels fo opy Mod	s -similarit –Co-refere ductive -Ui on -Influend Bayesian N Topic Moc -Interpreta r Informat deling -Ma s in Link An n Mining an	once -Na nsuperv ce of Co onparar deling -L ation ar ion Extr ximal E nalysis -I nalysis -I	pased d imed El ised Al ntext - <b>H</b> metric Latent S nd Eval raction intropy <b>H</b> Exampl iment A	ocument ntity and gorithms Indicator <b>ours: 09</b> Models - Semantic luation - -Hidden Markov <b>ours: 09</b> e-Mining Analysis -
Information ret search-matchin Relation Extract for Information Representation <b>UNIT – IV</b> Probabilistic M Graphical Model Indexing -Prob Probabilistic Do Markov Model Models -Condit <b>UNIT – V</b> Visualization Ap Text Streams -T Document Sent	rieval and tex g-inverted lis- tion -Templat Extraction. T s -Pattern Ext <b>Probabilistic</b> odels for Text els -Relations abilistic Later ocument Clus s -Stochastic ional Random <b>Recent Tren</b> oproaches -Ar Text Mining in timent Classifi t Mining Appl	t mining -key ts -evaluation e filling and o ext Summaria raction -Aprice <b>Models</b> Mining -Mix hip Between ht Semantic tering and T Context- Free Fields ds chitectural Co Multimedia cation -Opini	ion Retriev word search a. Informat database of zation Tech ori Algorith cture Mode Clustering, Indexing - opic Mode ee Gramma onsideratio -Text Analy on Lexicon Case studie	val and Infor ch-nearest-n ion extraction onstruction iniques -Top m -FP Tree a els -Stochast Dimension Latent Diric els -Probabi ars - Maxim ons -Visualiza /tics in Socia Expansion	eighboi on -Arch Applica ic Repr ilgorithi ic Proce Reduct hlet Al listic M hal Entr ation Te I Media -Aspect	method itecture tions. In esentation esses in I ion and location odels fo opy Moo echniques -Opinio -Based S	s -similarit –Co-refere ductive -Ui on -Influend Bayesian N Topic Mod -Interpreta r Informat deling -Ma s in Link An n Mining an Sentiment A	once -Na nsuperv ce of Co onparar deling -L ation ar ion Extr ximal E nalysis -I nalysis -I	hased d med En ised Al ntext - <b>H</b> metric Latent S nd Eval raction Entropy <b>H</b> Exampl iment A S - Opini	ocument ntity and gorithms Indicator <b>ours: 09</b> Models - Semantic luation - -Hidden Markov <b>ours: 09</b> e-Mining Analysis -
Information ret search-matchin Relation Extract for Information Representation UNIT – IV Probabilistic M Graphical Model Indexing -Prob Probabilistic De Markov Model Models -Condit UNIT – V Visualization Ap Text Streams -T Document Sent Detection –Text	rieval and tex g-inverted lis- tion -Templat Extraction. T s -Pattern Ext <b>Probabilistic</b> odels for Text els -Relations abilistic Later ocument Clus s -Stochastic ional Random <b>Recent Tren</b> oproaches -Ar Text Mining in timent Classifi t Mining Appl	t mining -key ts -evaluation e filling and ext Summaria raction -Aprice <b>Models</b> Mining -Mix hip Between ht Semantic tering and T Context- Free Fields ds chitectural Co Multimedia cation -Opini cations and C	ion Retriev word search a. Informat database of zation Tech ori Algorith cture Mode Clustering, Indexing - opic Mode ee Gramma onsideratio -Text Analy on Lexicon Case studie	val and Infor ch-nearest-n ion extraction onstruction miques -Top m -FP Tree a els -Stochast Dimension Latent Diric els -Probabi ars - Maxim ons -Visualiza ytics in Socia Expansion s	eighboi on -Arch Applica ic Repr ilgorithi ic Proce Reduct hlet Al listic M hal Entr ation Te I Media -Aspect	method itecture tions. In esentation esses in I ion and location odels fo opy Moo echniques -Opinio -Based S	s -similarit –Co-refere ductive -Ui on -Influend Bayesian N Topic Mod -Interpreta r Informat deling -Ma s in Link An n Mining an Sentiment A	ince -Na nsuperv ce of Co onparan deling -L ation ar ion Extr ion Extr ion Extr iximal E nalysis -I nd Sent Analysis	hased d med En ised Al ntext - <b>H</b> metric Latent S nd Eval raction Entropy <b>H</b> Exampl iment A S - Opini	ocument ntity and gorithms Indicator <b>ours: 09</b> Models - Semantic luation - -Hidden Markov <b>ours: 09</b> e-Mining Analysis -
Information ret search-matchin Relation Extrac for Information Representation UNIT – IV Probabilistic M Graphical Model Indexing -Prob Probabilistic De Markov Model Models -Condit UNIT – V Visualization Ap Text Streams -T Document Sent Detection –Text Total contact H	rieval and tex g-inverted lis- tion -Templat Extraction. T s -Pattern Ext <b>Probabilistic</b> odels for Text els -Relations abilistic Later ocument Clus s -Stochastic ional Random <b>Recent Tren</b> oproaches -Ar Text Mining in timent Classifi t Mining Appl	t mining -key ts -evaluation e filling and ext Summaria raction -Aprice <b>Models</b> Mining -Mix hip Between hip Between t Semantic tering and T Context- Free Fields ds chitectural Co Multimedia cation -Opini cations and C	ion Retriev word search a. Informat database of zation Tech ori Algorith sture Mode Clustering, Indexing - opic Mode ee Gramma onsideratio -Text Analy on Lexicon Case studie als: 15	val and Infor ch-nearest-n ion extraction onstruction iniques -Top m -FP Tree a els -Stochast Dimension Latent Diric els -Probabi ars - Maxim ons -Visualiza /tics in Socia Expansion s <b>Total Prac</b>	eighbon on -Arch Applica ic Repri- ligorithi ic Proce Reduct chlet Al listic M hal Entr ation Te l Media -Aspect	r method itecture tions. In essentation esses in I ion and location odels fo opy Mod cchniques -Opinio -Based S sses: -	s -similarit –Co-refere ductive -Ui on -Influence Bayesian N Topic Moc -Interpreta r Informat deling -Ma s in Link An n Mining an Sentiment A Total	nce -Na nsuperv ce of Co onparar deling -L ation ar ion Extr ximal E nalysis -I nd Sent Analysis	assed d imed Ei ised Al ntext - <b>H</b> metric atent S nd Eval raction intropy <b>H</b> Exampl iment A i -Opini	ocument ntity and gorithms Indicator <b>ours: 09</b> Models - Semantic luation - -Hidden Markov <b>ours: 09</b> e-Mining Analysis - on Spam
Information ret search-matchin Relation Extract for Information Representation UNIT – IV Probabilistic M Graphical Model Indexing -Prob Probabilistic De Markov Model Models -Condit UNIT – V Visualization Ap Text Streams -T Document Sent Detection –Text Total contact H Text Books: 1. Ronen	rieval and tex g-inverted lis tion -Templat Extraction. T s -Pattern Ext <b>Probabilistic</b> odels for Text els -Relations abilistic Later ocument Clus s -Stochastic ional Random <b>Recent Tren</b> oproaches -Ar fext Mining in timent Classifi t Mining Appl <b>Jours: 45</b>	t mining -key ts -evaluation e filling and ext Summaria raction -Aprice <b>Models</b> Mining -Mix hip Between ht Semantic tering and T Context- Free Fields ds chitectural Co Multimedia cation -Opini cations and C Total Tutoria mes Sanger	ion Retriev word search a. Informat database of zation Tech ori Algorith cture Mode Clustering, Indexing - opic Mode ee Gramma onsideratio -Text Analy on Lexicon Case studie als: 15	val and Infor ch-nearest-n ion extraction onstruction miques -Top m -FP Tree a els -Stochast Dimension Latent Diric els -Probabi ars - Maxim ons -Visualiza (tics in Socia Expansion s Total Pract	eighbon on -Arch Applica ic Repri- ligorithi ic Proce Reduct chlet Al listic M hal Entr ation Te l Media -Aspect	r method itecture tions. In essentation esses in I ion and location odels fo opy Mod cchniques -Opinio -Based S sses: -	s -similarit –Co-refere ductive -Ui on -Influence Bayesian N Topic Moc -Interpreta r Informat deling -Ma s in Link An n Mining an Sentiment A Total	nce -Na nsuperv ce of Co onparar deling -L ation ar ion Extr ximal E nalysis -I nd Sent Analysis	assed d imed Ei ised Al ntext - <b>H</b> metric atent S nd Eval raction intropy <b>H</b> Exampl iment A i -Opini	ocument ntity and gorithms Indicator <b>ours: 09</b> Models - Semantic luation - -Hidden Markov <b>ours: 09</b> e-Mining Analysis - on Spam
Information ret search-matchin Relation Extract for Information Representation UNIT – IV Probabilistic M Graphical Model Indexing -Prob Probabilistic De Markov Model Models -Condit UNIT – V Visualization Ap Text Streams -T Document Sent Detection –Text Total contact H Text Books: 1. Ronen Unstrue	rieval and tex g-inverted list tion -Templat Extraction. T s -Pattern Ext Probabilistic odels for Text els -Relations abilistic Later ocument Clus s -Stochastic ional Random Recent Tren oproaches -Ar Text Mining in timent Classifi t Mining Appl ours: 45 Feldman, Ja	t mining -key ts -evaluation e filling and ext Summaria raction -Aprice <b>Models</b> Mining -Mix hip Between ht Semantic tering and T Context- Free Fields ds chitectural Co Multimedia cation -Opini cations and C <b>Total Tutoria</b> mes Sanger Cambridge Ur	ion Retriev word search in Informat database of zation Tech ori Algorith cture Mode Clustering, Indexing - fopic Mode ee Gramma onsideratio -Text Analy on Lexicon Case studie als: 15	val and Infor ch-nearest-n ion extraction onstruction miques -Top m -FP Tree a els -Stochast Dimension Latent Diric els -Probabi ars - Maxim ons -Visualiza (tics in Socia Expansion s Total Prace ess, 2006.	eighbon on -Arch Applica ic Repri- ilgorithi ic Proce Reduct hlet Al listic M hal Entr ation Te l Media -Aspect tical Cla Handbo	method itecture tions. In essentation esses in I ion and location odels fo opy Mod chniques -Opinion -Based S sses: -	s -similarit —Co-refere ductive -Ui on -Influend Bayesian N Topic Mod -Interpreta r Informat deling -Ma s in Link An n Mining an Sentiment A Total anced App	ince -Na nsuperv ce of Co onparar deling -L ation ar ion Extr ximal E nalysis -I nalysis -I nalysis -I nalysis -I nalysis -I nalysis -I nalysis -I	med Edised Al intext - <b>H</b> metric Latent S nd Eval raction intropy <b>H</b> Exampl iment A i -Opini 50	ocument ntity and gorithms Indicator <b>ours: 09</b> Models - Semantic luation - -Hidden Markov <b>ours: 09</b> e-Mining Analysis - on Spam
Information ret search-matchin Relation Extract for Information Representation UNIT – IV Probabilistic M Graphical Model Indexing -Prob Probabilistic Do Markov Model Models -Condit UNIT – V Visualization Ap Text Streams -T Document Sent Detection –Text Total contact H Text Books: 1. Ronen Unstrue 2. Weiss,	rieval and tex g-inverted list tion -Templat Extraction. T s -Pattern Ext <b>Probabilistic</b> odels for Text els -Relations abilistic Later ocument Clus s -Stochastic ional Random Recent Tren oproaches -Ar Text Mining in timent Classifit t Mining Appl ours: 45 Feldman, Ja ctured Data , 0	t mining -key ts -evaluation e filling and ext Summaria raction -Aprice <b>Models</b> Mining -Mix hip Between ht Semantic tering and T Context- Free Fields ds chitectural Co Multimedia cation -Opini cations and C Total Tutoria mes Sanger Cambridge Ur	ion Retriev word search a. Informat database of zation Tech ori Algorith dure Mode Clustering, Indexing - opic Mode ee Gramma onsideratio -Text Analy on Lexicon Case studie als: 15	val and Infor ch-nearest-n ion extraction onstruction miques -Top m -FP Tree a els -Stochast Dimension Latent Diric els -Probabi ars - Maxim ons -Visualiza (tics in Socia Expansion s Total Prace ess, 2006.	eighbon on -Arch Applica ic Repri- ilgorithi ic Proce Reduct hlet Al listic M hal Entr ation Te l Media -Aspect tical Cla Handbo	method itecture tions. In essentation esses in I ion and location odels fo opy Mod chniques -Opinion -Based S sses: -	s -similarit —Co-refere ductive -Ui on -Influend Bayesian N Topic Mod -Interpreta r Informat deling -Ma s in Link An n Mining an Sentiment A Total anced App	ince -Na nsuperv ce of Co onparar deling -L ation ar ion Extr ximal E nalysis -I nalysis -I nalysis -I nalysis -I nalysis -I nalysis -I nalysis -I	med Edised Al intext - <b>H</b> metric Latent S nd Eval raction intropy <b>H</b> Exampl iment A i -Opini 50	ocument ntity and gorithms Indicator <b>ours: 09</b> Models - Semantic luation - -Hidden Markov ours: 09 e-Mining Analysis - on Spam
Information ret search-matchin Relation Extract for Information Representation UNIT – IV Probabilistic M Graphical Model Indexing -Prob Probabilistic De Markov Model Models -Condit UNIT – V Visualization Ap Text Streams -T Document Sent Detection –Text Total contact H Text Books: 1. Ronen Unstrue 2. Weiss, Unstrue	rieval and tex g-inverted list tion -Templat Extraction. T s -Pattern Ext Probabilistic odels for Text els -Relations abilistic Later ocument Clus s -Stochastic ional Random Recent Tren oproaches -Ar Text Mining in timent Classifit t Mining Appl ours: 45 Feldman, Ja ctured Data , 0 S.M., Indurk	t mining -key ts -evaluation e filling and ext Summaria raction -Aprice <b>Models</b> Mining -Mix hip Between ht Semantic tering and T Context- Free Fields <b>ds</b> chitectural Co Multimedia cation -Opini cations and C <b>Total Tutoria</b> mes Sanger Cambridge Ur hya, N., Zhi ation, Springe	ion Retriev word search in Informat database of zation Tech ori Algorith cture Mode Clustering, Indexing - opic Mode ee Gramma onsideratio -Text Analy on Lexicon Case studie als: 15 , The Tex- niversity pr ang, T., De er 2004.	val and Infor ch-nearest-n ion extraction onstruction miques -Top m -FP Tree a els -Stochast Dimension Latent Diric els -Probabi ars - Maxim ons -Visualiza ytics in Socia texpansion s Total Prac t Mining I ess, 2006. oamerau, F.	eighbon on -Arch Applica ic Repri- ic Proce Reduct thet Al listic M hal Entr ation Te I Media -Aspect tical Cla Handbo Text M	method itecture tions. In esentation esses in I ion and location odels fo opy Mod chniques -Opinioi -Based S sses: -	s -similarit —Co-refere ductive -Ui on -Influend Bayesian N Topic Mod -Interpreta r Informat deling -Ma s in Link An n Mining an Sentiment A Total anced App	ince -Na nsuperv ce of Co onparar deling -L ation ar ion Extr ximal E nalysis -I nalysis -I nalysis -I nalysis -I nalysis -I nalysis -I nalysis -I	med Edised Al intext - <b>H</b> metric Latent S nd Eval raction intropy <b>H</b> Exampl iment A i -Opini 50	ocument ntity and gorithms Indicator <b>ours: 09</b> Models - Semantic luation - -Hidden Markov <b>ours: 09</b> e-Mining Analysis - on Spam
Information ret search-matchin Relation Extract for Information Representation UNIT – IV Probabilistic M Graphical Mode Indexing -Prob Probabilistic Do Markov Model Models -Condit UNIT – V Visualization Ap Text Streams -T Document Sent Detection –Text Total contact H Text Books: 1. Ronen Unstruc 2. Weiss, Unstruc 3. Charu O	rieval and tex g-inverted list tion -Templat Extraction. T s -Pattern Ext Probabilistic odels for Text els -Relations abilistic Later ocument Clus s -Stochastic ional Random Recent Tren oproaches -Ar Text Mining in timent Classifit Mining Appl ours: 45 Feldman, Ja ctured Data , 0 S.M., Indurk ctured Inform C. Aggarwal, C ks:	t mining -key ts -evaluation e filling and ext Summariz raction -Aprice <b>Models</b> Mining -Mix hip Between ht Semantic tering and T Context- Free Fields ds chitectural Co Multimedia cation -Opini cations and C Total Tutoria mes Sanger Cambridge Ur hya, N., Zha ation, Springe hengXiang Zh	ion Retriev word search a. Informat database of zation Tech ori Algorith dure Mode Clustering, Indexing - copic Mode ee Gramma onsideratio -Text Analy on Lexicon Case studie als: 15 , The Tex niversity pr ang, T., De er 2004. hai ,Mining	val and Infor ch-nearest-n ion extraction onstruction iniques -Top m -FP Tree a els -Stochast Dimension Latent Diric els -Probabi ars - Maxim ons -Visualiza (tics in Social Expansion s Total Pract ess, 2006. Damerau, F. Text Data, S	eighbon on -Arch Applica ic Repri- ligorithi ic Proce Reduct hlet Al listic M hal Entr ation Te l Media -Aspect tical Cla Handbo Text M pringer,	r method itecture tions. In esentation esses in I ion and location odels fo opy Mod chniques -Opinio -Based S sses: - ok: Adva lining Pr 2012.	s -similarit —Co-refere ductive -Ui on -Influend Bayesian N Topic Mod -Interpreta r Informat deling -Ma s in Link An m Mining an Sentiment A Total I anced App redictive N	nce -Na nsuperv ce of Co onparan deling -L ation ar ion Extr ximal E nalysis -I nd Sent Analysis Hours: ( proache	assed d imed El ised Al ntext - <b>H</b> metric atent S nd Eva raction raction raction finent A s -Opini <b>50</b> s in A	ocument ntity and gorithms Indicator <b>ours: 09</b> Models - Semantic luation - -Hidden Markov <b>ours: 09</b> e-Mining Analysis - on Spam
Information ret search-matchin Relation Extract for Information Representation UNIT – IV Probabilistic M Graphical Model Indexing -Prob Probabilistic De Markov Model Models -Condit UNIT – V Visualization Ap Text Streams -T Document Sent Detection –Text Total contact H Text Books: 1. Ronen Unstrue 2. Weiss, Unstrue 3. Charu (C Reference Bool	rieval and tex g-inverted list tion -Templat Extraction. T s -Pattern Ext <b>Probabilistic</b> odels for Text els -Relations abilistic Later ocument Clus s -Stochastic ional Random <b>Recent Tren</b> oproaches -Ar Text Mining in timent Classifit t Mining Appl <b>Jours: 45</b> Feldman, Ja ctured Data , G S.M., Indurk ctured Inform C. Aggarwal, C	t mining -key ts -evaluation e filling and ext Summaria raction -Aprice <b>Models</b> Mining -Mix hip Between ht Semantic tering and T Context- Free Fields ds chitectural Co Multimedia cation -Opini cations and C Total Tutoria mes Sanger Cambridge Ur hya, N., Zha ation, Springe hengXiang Zh	ion Retriev word search in Informat database of zation Tech ori Algorith dure Mode Clustering, Indexing - opic Mode ee Gramma onsideratio -Text Analy on Lexicon Case studie <b>als: 15</b> , The Tex- niversity pr ang, T., De er 2004. hai ,Mining ya and Tor	val and Infor ch-nearest-n ion extraction onstruction iniques -Top m -FP Tree a els -Stochast Dimension Latent Diric els -Probabi ars - Maxim ons -Visualiza (tics in Social Expansion s Total Pract ess, 2006. Damerau, F. Text Data, S	eighbon on -Arch Applica ic Repri- ligorithi ic Proce Reduct hlet Al listic M hal Entr ation Te l Media -Aspect tical Cla Handbo Text M pringer,	r method itecture tions. In esentation esses in I ion and location odels fo opy Mod chniques -Opinio -Based S sses: - ok: Adva lining Pr 2012.	s -similarit —Co-refere ductive -Ui on -Influend Bayesian N Topic Mod -Interpreta r Informat deling -Ma s in Link An m Mining an Sentiment A Total I anced App redictive N	nce -Na nsuperv ce of Co onparan deling -L ation ar ion Extr ximal E nalysis -I nd Sent Analysis Hours: ( proache	assed d imed El ised Al ntext - <b>H</b> metric atent S nd Eva raction raction raction finent A s -Opini <b>50</b> s in A	ocument ntity and gorithms Indicator <b>ours: 09</b> Models - Semantic luation - -Hidden Markov <b>ours: 09</b> e-Mining Analysis - on Spam

- http://nptel.ac.in/courses/106106093/35
   http://nptel.ac.in/syllabus/106101007/

Semester :	omputer Science and Engineering	Category			(Distribute			
Semester .			s / We		Credit	Ma	ximum l	Aarko
Subject Code	Subject	L	S / We	Р	Credit	CA	SE	TM
CSE65	Social Network Analytics	3	1	г -	4	40	60	100
Prerequisite		5	1		4	40	00	100
rerequisite	The students are to							
	Understand the social network	concents a	nd vari	ous me	thods of a	nalvsis		
Objectives	<ul> <li>Understand the social network</li> <li>Understand the underlying mat</li> </ul>	•				•		
	<ul> <li>Get an overview of the structure</li> </ul>					/0183.		
	At the end of the course the students w				etworks.			
	<ul> <li>Understand the data in the Soci</li> </ul>							
Outcome	<ul> <li>Identify, formulate and analy.</li> </ul>		•	k nroh	loms and	intern	rat tha	rocult
	obtained.			k prob	anu	interp	iet the	results
UNIT – I	Network, Relations and Structure						Но	urs: 09
	works Perspective- Network Data- Bour	ndary Spec	rificatio	on and	Sampling	- Type	-	
	Aeasurement and Collection	lucity oper			Samping	Type		cworks
UNIT – II	Mathematical Representations of Soci	al Network	s				Но	urs: 09
	c Notation- Sociometric Notation- Algebra			aphs- D	)irected G	raphs-		
•	d Graphs- Valued Graphs- Valued Dire			•		•	-	•
Matrices- Prope					1 71-			
UNIT – III	Structural and Locational Properties						Ho	ours: 09
Actor Centrality	y- Degree Centrality- Closeness Centra	ality- Betw	veenne	ss Cer	ntrality- Ir	format	ion Cei	ntrality
Structural Balan	ce- Clusterability- Generalizations of Clust	erability- T	ransiti	vity	-			-
UNIT – IV	Roles and Positions						Ho	ours: 09
Background- Str	ructural Equivalence- Automorphic and	Isomorphic	: Equiv	alence	- Regular	Equival	ence- T	ypes o
Ties- Local Role	Equivalence- Ego Algebras							
UNIT – V	Dyadic and Triadic Methods						Но	ours: 09
The Dyad Censu	us- The Example and Its Dyad Census- Ai	n Index for	Mutu	ality- Si	imple Dist	ributior	ns on Di	graphs
Conditional Unit	form Distributions- The Triad Census- The	e Example	and Its	Triad	Census- M	ean an	d Variar	nce of a
Triad Census								
Total contact Ho	ours: 45 Total Tutorials: 15 To	tal Practica	al Class	es: -	Tota	l Hours	s: 60	
Text Books:								
1. John Sco	ott ,Social Network Analysis – A Handbook	: , SAGE Pul	blicatio	ns, 2nc	Edition,20	000.		
Reference Book								
•	Wasserman and Katherine Faust, Social N	letwork An	alysis -	- Meth	ods and A	oplicati	ons, Car	nbridge
	ty Press,1994.							
	noke and Song Yang, Social Network Analy	sis, SAGE F	Publicat	tions, 2	nd Edition,	,2007.		
Websites:								<b>.</b>
	Network Analysis Theory and Applica	ations by	availa	ble at	http://tr	ain.ed.	psu.edu,	/WFED
	Net_TheoryApp.pdf					<b>_</b> · · · ·		
	ction to social network methods by	Robert A.	Hann	eman	and Mark	k Riddl	e availa	able a
http://fa	aculty.ucr.edu/~hanneman/nettext/							

Department : C	computer Science and Engineering	Progra	mme :	: M.Te	ech. (Distr	ibuted S	Systems)	
Semester :		Catego	ory :	: TY				
Subject Code	Subject	Hou	rs / We	ek	Credit	M	aximum	Marks
Subject Code	Subject	L	Т	Ρ	С	CA	SE	ТМ
CSE66	Geographical Information System	3	1	-	4	40	60	100
Prerequisite	-							
Objectives	<ul> <li>Basic understanding of spatial phe</li> <li>The quantitative analysis and qua GIS database.</li> <li>Capacity to understand possibilities</li> </ul>	litative a	analysi	s of s	patial and	l attribu	te inforr	nation in a
Outcome	<ul> <li>On completion of this course, students wi</li> <li>Deep theoretical knowledge ab present geographical data</li> <li>Apply GIS analyses to address geo</li> <li>Provide a spatial visualization ca geographical features.</li> </ul>	II be able oout hov ospatial p	e to v to c problen	aptur ns.	re, impor	t, struc		
UNIT – I	Introduction							Hours: 09
The nature of G	IS – The Real World and representations of	it – Geo	graphi	c Info	rmation S	ystems	– Stages	of Spatial
Data handling -	Database Management Systems - GIS and	spatial d	atabas	es – S	Structure	of this b	ook.	
UNIT – II	Geographic Information and Spatial Data	Types						Hours: 09
Models and rep	presentations of Real World – Geographic I	Phenom	ena – O	Comp	uter Repr	esentat	ions of C	Geographic
Information – C	prganizing and Managing Spatial Data – The	Tempor	al Dime	ensio	ns.			
UNIT – III	Data Entry and Preparation							Hours: 09
	out – Spatial Referencing - Data Quality – Continuous Field Rasters.	Data Pre	eparati	on –	Point Dat	a Prepa	ration –	Advanced
UNIT – IV	Spatial Data Analysis							Hours: 09
Classification o	f analytical GIS capabilities – Retrieval, o functions – Network Analysis – GIS and a						•	unctions –
UNIT – V	Data Visualization							Hours: 09
•	The visualization process – Visualization sti p dissemination	rategies:	preser	nt or (	explore? -	- How to	o Map –	Мар
Total contact H	-	l Practic	al Clas	ses:	То	tal Hou	rs: 60	
Text Books:	R 1 = 5 = 5		_					
<ol> <li>Otto Hu Institut Interna</li> </ol>	tional Edition 2009.	•			•			ternational ok series,
Reference Bool			-					
	Buckley, An introduction to Geographic In	formatic	on Syste	em,F	ebruary 1	L997.		
1. David J.	Buckley, An introduction to Geographic In chmitz, Essentials of Geographic Informatio		•		ebruary 1	1997.		
1. David J.			•		ebruary 1	1997.		

Course a strong of the second	omputer Science and Engineering	-			ech. (Disti	ibuted s	systems	
Semester :		Cate		: TY	1			
Subject Code	Subject		irs / W	1	Credit		aximum	
CSE67	Internals of Operating System	<b>L</b> 3	<b>T</b> 1	P -	<b>C</b> 4	<b>CA</b> 40	<b>SE</b> 60	<b>TM</b> 100
Prerequisite		5				40	00	100
Objectives	<ul> <li>To identify the necessity of variou</li> <li>To analyze the mechanism of organization of Unix and Windows</li> <li>To design various data structures</li> </ul>	proces s opera	s com ting sys	munio stems	ation and	d the d	lifferenc	es in the
Outcome	<ul> <li>On successful completion of the course, th</li> <li>Explain the components in Unix an</li> <li>Use the system calls whenever the</li> <li>Know the storage of information system and develop the algorithm</li> <li>Appreciate the appropriateness of process and files</li> </ul>	nd Wind ey are r n of sys is to pe	dows o lecessa stem u rform l	perati iry sage kernel	ing system and other functions	inform		
UNIT – I	Buffer Cache and File Sub-System						Но	urs: 09
Cache: Buffer he file, Directories,	Kernel - Architecture of the UNIX operate eader, Structure of Buffer pool, Reading and Super block, Inode assignment.			•			ucture o	f a regular
UNIT – II	System Calls and Process Sub-System							urs: 09
•	DPEN, Read, Close, Write, Create, CHMOD, em memory, Context, Process control, proce				-		-	
UNIT – III	Inter-Process Communications						Но	urs: 09
	Communications - Process tracing, Syste is - Socket programming: Sockets, desc ets.						•	
UNIT – IV	Windows System Components						Но	urs: 09
Windows Onors	ating system - versions, Concepts and tools,	14/ <sup>1</sup> 1 -	• •	rnalc	System A	بليم مراجع المري		-
and design goal Trap dispatching	s, Operating system model, Architecture ov g, object manager, Synchronization, System	verview	, Key s	ystem	compone	nts. Sys	tem me	chanisms -
and design goal	s, Operating system model, Architecture ov g, object manager, Synchronization, System ent tracing.	verview	, Key s	ystem	compone	nts. Sys	tem meo s, Local p	chanisms -
and design goal Trap dispatching calls, Kernel ever UNIT – V Windows Mana shooting Regis Windows Mana Thread Internal	s, Operating system model, Architecture ov g, object manager, Synchronization, System ent tracing. Registry and Process Management gement Mechanisms - The registry, Regist try problems, Registry Internals, Service gement Instrumentation, Processes, Threa s, Examining Thread creation, Thread Sched	ry usag s, App ds, and uling, J	, Key s thread ge, Reg licatior Jobs: ob Obje	ystem ds, Wi istry ns, Ac Proces	compone ndows glc data types counts, S ss Interna	nts. Sys bal flag 5, Local Service Is, Flow	tem mee s, Local p Ho structure control of creat	chanisms - procedural urs: 09 e, Trouble Manager,
and design goal Trap dispatching calls, Kernel eve UNIT – V Windows Mana shooting Regis Windows Mana Thread Internal Total contact H	s, Operating system model, Architecture ov g, object manager, Synchronization, System ent tracing. Registry and Process Management gement Mechanisms - The registry, Regist try problems, Registry Internals, Service gement Instrumentation, Processes, Threa s, Examining Thread creation, Thread Sched	verview worker ry usag s, App ds, and	, Key s thread ge, Reg licatior Jobs: ob Obje	ystem ds, Wi istry ns, Ac Proces	compone ndows glc data types counts, S ss Interna	nts. Sys bal flag , Local service	tem mee s, Local p Ho structure control of creat	chanisms - procedural urs: 09 e, Trouble Manager,
and design goal Trap dispatching calls, Kernel ever UNIT – V Windows Mana shooting Regis Windows Mana Thread Internal Total contact Ho Total contact Ho Text Books: 1. Maurice 2. Mark E. 2004.	s, Operating system model, Architecture over g, object manager, Synchronization, System ent tracing. Registry and Process Management agement Mechanisms - The registry, Register try problems, Registry Internals, Service agement Instrumentation, Processes, Thread s, Examining Thread creation, Thread Sched ours: 45 Total Tutorials: 15 Total e J. Bach, The Design of the Unix Operating S Russinovich and David A. Solomon, Micros	rerview worker ry usag s, App ds, and uling, Ju I Praction System,	, Key s r thread ge, Reg licatior Jobs: ob Obje <b>cal Clas</b> Prenti	ystem ds, Wi istry ns, Ac Proces ects. sses: ce Ha	data types counts, S ss Interna - 1	nts. Sys bal flag , Local service s, Flow Fotal Ho 1991	tem mee s, Local p Ho structure control of creat	chanisms - procedural urs: 09 e, Trouble Manager, e process,
and design goal Trap dispatching calls, Kernel ever UNIT – V Windows Mana shooting Regis Windows Mana Thread Internal Total contact Ho Text Books: 1. Maurice 2. Mark E. 2004. Reference Book	s, Operating system model, Architecture ov g, object manager, Synchronization, System ent tracing. <b>Registry and Process Management</b> agement Mechanisms - The registry, Registry try problems, Registry Internals, Service agement Instrumentation, Processes, Threa s, Examining Thread creation, Thread Sched ours: 45 Total Tutorials: 15 Tota e J. Bach, The Design of the Unix Operating S Russinovich and David A. Solomon, Micros	rerview worker rry usag s, App ds, and <u>uling</u> , Ju <b>Praction</b> System, soft <sup>®</sup> W	, Key s r thread ge, Reg licatior Jobs: ob Objo <b>cal Clas</b> Prenti /indow	ystem ds, Wi sistry ns, Ac Proces ects. sects. secs: ce Ha s <sup>®</sup> Int	data types counts, S ss Interna Il of India, ernals, 4th	nts. Sys bal flag s, Local service s, Flow <b>Fotal Ho</b> 1991 n Editior	tem mee s, Local p Ho structure control of creat	chanisms - procedural urs: 09 e, Trouble Manager, e process, soft Press,
and design goal Trap dispatching calls, Kernel ever UNIT – V Windows Mana shooting Regis Windows Mana Thread Internal Total contact H Text Books: 1. Maurice 2. Mark E. 2004. Reference Book 1. William	s, Operating system model, Architecture over g, object manager, Synchronization, System ent tracing. Registry and Process Management agement Mechanisms - The registry, Register try problems, Registry Internals, Service agement Instrumentation, Processes, Thread s, Examining Thread creation, Thread Sched ours: 45 Total Tutorials: 15 Total e J. Bach, The Design of the Unix Operating S Russinovich and David A. Solomon, Micros	rerview worker rry usag s, App ds, and <u>uling</u> , Ju <b>Praction</b> System, soft <sup>®</sup> W	, Key s r thread ge, Reg licatior Jobs: ob Objo <b>cal Clas</b> Prenti /indow	ystem ds, Wi sistry ns, Ac Proces ects. sects. secs: ce Ha s <sup>®</sup> Int	data types counts, S ss Interna Il of India, ernals, 4th	nts. Sys bal flag s, Local service s, Flow <b>Fotal Ho</b> 1991 n Editior	tem mee s, Local p Ho structure control of creat	chanisms - procedural urs: 09 e, Trouble Manager, e process, soft Press,
and design goal Trap dispatching calls, Kernel ever UNIT – V Windows Mana shooting Regis Windows Mana Thread Internal Total contact Ho Total contact Ho 2004. Refererce Book 1. William Websites: 1. https:// 2. https:// 3. https:// 4. http://w	s, Operating system model, Architecture ov g, object manager, Synchronization, System ent tracing. <b>Registry and Process Management</b> agement Mechanisms - The registry, Registry try problems, Registry Internals, Service agement Instrumentation, Processes, Threa s, Examining Thread creation, Thread Sched ours: 45 Total Tutorials: 15 Tota e J. Bach, The Design of the Unix Operating S Russinovich and David A. Solomon, Micros	ry usag s, App ds, and uling, Ju <b>Practi</b> System, soft <sup>®</sup> W Desigr ob9639 catego	, Key s r thread ge, Reg licatior Jobs: ob Obje <b>cal Clas</b> Prenti /indow	ystem ds, Wi hs, Ac Procesects. sects. ce Ha s® Int ples , 1	compone ndows glo data types counts, S ss Internal - 1 Il of India, ernals, 4th 5th Edition	nts. Sys bal flag s, Local service s, Flow <b>Fotal Ho</b> 1991 n Editior	tem mee s, Local p Ho structure control of creat	chanisms - procedural urs: 09 e, Trouble Manager, e process, soft Press,

Semester :	omputer Science and Engineering	Categ		TY	h. (Distrib	accu Jys		
Semester .			urs / W		Credit	Ma	ximum	Marks
Subject Code	Subject	L	T	P	C	CA	SE	TM
CSE68	Distributed System Security	3	1	-	4	40	60	100
Prerequisite	-			1		1		
Objectives	<ul> <li>To understand the various the each layers of distributed system.</li> <li>To understand the secure softem.</li> <li>To know the emerging area Encryption.</li> </ul>	tems tware deve a of Userce	elopme entric l	nt lifec dentity	ycle proces y Managei	ss for dis	tributed	l systems
Outcome	<ul> <li>On successful completion of the cours</li> <li>Structure and design the d protection</li> <li>Have knowledge on the threa systems</li> </ul>	listributed	system	ns usin	g multiple			
UNIT – I							Hou	rs: 09
Lifecycle Proces	Distributed Systems, Distributed System ses - A Typical Security Engineering y Issues and Technologies: Security Issu	Process -	Security	y Engii	neering Gu	-		•
UNIT – II							Hou	rs: 09
Escalation - Inj Vulnerabilities -	pyware - Worms/Viruses – Eavesdropp ection Attacks. Infrastructure-Level Grid Computing Threats and Vulnerab preats and Vulnerabilities.	Threats a	nd Vu	Inerabi	lities: Net	work-Le	vel Thr	eats and
UNIT – III							Hou	rs: 09
Site Scripting (> Insecure Config Threats and Vu Threats and Vu	el Threats and Vulnerabilities: Applica (SS) - Improper Session Management - uration Issues - Denial of Service - Cano Ilnerabilities: SOA and Role of Standa nerabilities - Service-Level Attacks - Ser	Improper onical Repr ards - Serv	Error H esentat vice-Lev	landlin tion Fla rel Sec	g - Improp ws - Over	er Use c flow Issu	of Crypto ues. Serv s - Serv	ography - vice-Level vice-Level
UNIT – IV					<u> </u>			rs: 09
– Antimalware	tions: Sandboxing – Virtualization - Resonants Infrastructure-Level Solutions: Netwoication-Level Solutions: Application-Level Solutions: Applications: Applications: Applications: Applications: Applications: Application	vork-Level	Solutio	ns - G				
UNIT – V		,					Hou	rs: 09
Architectures f Compliance - S Financial Applic	olutions: Services Security Policy - SOA or SOA Security - Managing Service OX Security Solutions - Multilevel Po ation - Security Requirements Analysis sercentric Identity Management - Identi	-Level Thro licy-Driven 5. Future I ty-Based E	eats - Solutio Directio ncryptio	Compl on Arc ons - C	iance in l hitecture oud Comp ) - Virtualiz	Financial Case Souting Se	Service tudy: G ecurity – Host Se	es - SOX rid - The - Security
<ol> <li>Abhijit Padmar Wiley P</li> </ol>	Belapurkar, Anirban Chakrabarti, nabhuni and Srikanth Sundarrajan, Dis ubilications, First Edition, 2009.	Harigopal	Ponr	napalli,	Niranjan	Varad	arajan,	Srinivas
1. Abhijit Padmar	Belapurkar, Anirban Chakrabarti, nabhuni and Srikanth Sundarrajan, Dis ubilications, First Edition, 2009.	Harigopal	Ponr	napalli,	Niranjan	Varad	arajan,	Srinivas
1. Abhijit Padmar Wiley P Reference Bool 1. Yang X Compar 2. Rachid	Belapurkar, Anirban Chakrabarti, nabhuni and Srikanth Sundarrajan, Dis ubilications, First Edition, 2009.	Harigopal tributed Sy ed and N	Ponr vstems etwork	apalli, Securii ing Sy	Niranjan cy: Issues, stems, Wo	Varad Processe orld Scie	arajan, es and S entific P	Srinivas Solutions, Publishing
<ol> <li>Abhijit Padmar Wiley P</li> <li>Reference Bool</li> <li>Yang X Comparent</li> </ol>	Belapurkar, Anirban Chakrabarti, nabhuni and Srikanth Sundarrajan, Dist ubilications, First Edition, 2009. <b><s:< b=""> iao and Yi Pan, Security in Distribut ny, 2007.</s:<></b>	Harigopal tributed Sy ed and N	Ponr vstems etwork	apalli, Securii ing Sy	Niranjan cy: Issues, stems, Wo	Varad Processe orld Scie	arajan, es and S entific P	Srinivas Solutions, Publishing

## com-plus-28 3. http://www.nr.no/~abie/security.htm

_	omputer Scie	ence and Engineerin	ig Pro	gramm	<b>ne :</b> M.T	ech. (Distr	ributed S	Systems)			
Semester :			Cat	Category : TY							
Cubicat Carls	Subject		Ho	Hours / Week Credit				Maximum Marks			
Subject Code			L	Т	Р	C	СА	SE	ТМ		
CSE69	Ethical Hacking			-	-	4	40	60	100		
Prerequisite	-										
Objectives	<ul> <li>To immerse the students into an interactive environment where they will be shown how to scan, test, hack and secure their own systems</li> <li>To give students in-depth knowledge and practical experience with the current essentia security systems</li> <li>To learn how intruders escalate privileges and what steps can be taken to secure a system</li> </ul>										
Outcome	<ul> <li>On successful completion of the course, the students will be able to:</li> <li>Defend a computer against a variety of different types of security attacks using a numbe of hands-on techniques</li> <li>Defend a LAN against a variety of different types of security attacks using a number o hands-on techniques Practice and use safe techniques on the World Wide Web</li> </ul>										
UNIT – I	Introductio	n to Ethical Hacking	5					Hou	rs: 09		
Introduction-Im	portance of s	Security-Elements o	of Security-Phase	of an A	Attack-	Hacker Att	acks –H	acktivisn	n – Ethica		
Hackers – Com	puter Crimes	and Implication.									
UNIT – II	Footprints							Hou	rs: 09		
Introduction -	Information	gathering methodo	ology – Footprint	ing too	ols – W	HOIS Too	I- DNS I	nformati	on tool -		
Locating the ne	twork range -	- E-mail spiders – Lo	ocating network a	ctivity	– Meta	Search Er	ngines.				
UNIT – III	Scanning and Enumeration								Hours: 09		
Scanning: Intro	duction – Ob	jectives of scanning	g – Scanning met	hodolo	ogies –	Tools - En	umerati	on: Intro	duction ·		
Techniques – P	rocedures – T	ools.									
UNIT – IV	Social Engineering								Hours: 09		
	ing – Threats	tion- Human weak and Defense – Co									
UNIT – V	NIT – V System Hacking							Hou	Hours: 09		
		sword – Password									
cracking Tools -	- Countermea	isure – Escalating Pi	rivileges- Executii	ng App	lication	s – Key log	gers and	d spywar	es.		
Total contact H	ours: 60	Total Tutorials: -	Total Prac	tical Cl	asses:	- 1	Гotal Ho	urs: 60			
Text Books:											
		lacking and Counte Hacking and Counte					-		Learning		
2. EC- Cou 2009.											
	ks:										
2009. Reference Boo		Hands-On Ethical H	acking and Netw	ork Det	fense, C	Cengage Le	earning,	2012.			
2009. Reference Boo		Hands-On Ethical H	acking and Netw	ork Dei	fense, C	Cengage Le	earning,	2012.			

Subject Code         Subject         Hours / Week         Credit         Maximum Marks           CSE70         Embedded Systems         3         1         -4         40         60         10           Prerequisite:         -         -         4         40         60         10           Objectives         -         To provide a clear understanding on the basic concepts, ARM processor and Architecture           Objectives         -         To introduce on Embedded Process development Environment         -         -         4         40         60         10           Objectives         -         To introduce on Embedded Process development Environment         -         To introduce on Embedded System Summent         - <th>Department : C</th> <th>omputer Scie</th> <th></th> <th colspan="8">Programme : M.Tech. (Distributed Systems)</th>	Department : C	omputer Scie		Programme : M.Tech. (Distributed Systems)							
Subject Code         Subject Stress         Image: Construct Stress         Image: Constress         Image: Construct Stress <thi< th=""><th>Semester :</th><th></th><th></th><th></th><th colspan="7">Category : TY</th></thi<>	Semester :				Category : TY						
CSE70       Embedded Systems       3       1       -       4       40       60       100         Prerequisite:       -	Subject Code	Subject									
Prerequisite:         -           Objectives         -           To provide a clear understanding on the basic concepts, ARM processor and Architectur.           Objectives         -           To introduce on Embedded Process development Environment           -         To study on Basic of Processes and Operating systems           On successful completion of the course, the students will be able to:           Outcomes         -           Design Embedded System with real time constraints         Hours: 09           Embedded Computing - Challenges of Embedded Systems – Embedded System design process - Processor           Embedded System – Other Hardware Units in the Embedded System - Software Embedded into a System - AR           Vector Table - Architecture Revision - ARM Processor Families.         Hours: 09           INTUT-II         Hours: 09           RMM Instruction Set - Data Processing Instructions - Addressing Modes - Branch, Load, Store Instructions - PS Instructions - Conditional Instructions. Thumb Instruction Set - Register Instructions - Stack - Software Interrup Instructions - Single-Register and Multi Register Load-Store Instructions - Stack - Software Interrup and inline assembly- Portability issues.         Hours: 09           Optimizing Assembly Code - Profiling and cycle counting – instruction scheduling – Register allocation – condition execution – looping constructs – bit manipulation – efficient switches – optimized primitives. Processes an Operating systems - Multiple tasks and processes – Context switching – Scheduling policies –	CSE70	Embedded	Vistoms				P			-	
<ul> <li>To provide a clear understanding on the basic concepts, ARM processor and Architectur.</li> <li>To introduce on Embedded Process development Environment</li> <li>To study on Basic of Processes and Operating systems</li> <li>On successful completion of the course, the students will be able to:</li> <li>Have skills in the Embedded C Programming</li> <li>Design Embedded System with real time constraints</li> <li>Hours: 09</li> <li>Embedded System – Other Hardware Units in the Embedded System - Software Embedded into a System - ARI Architecture: ARM Design Philosophy - Registers - Program Status Register - Instruction Pipeline - Interrupts an Vector Table - Architecture Revision - ARM Processor Families.</li> <li>HUIT - I</li> <li>Hours: 09</li> <li>ARM Instruction Set - Data Processing Instructions - Addressing Modes - Branch, Load, Store Instructions - Data Processing Instructions - Active European Conditional Instructions. Thumb Instruction Set - Register Usage - Other Branch Instructions - Data Processing Instructions - Conditional Instructions. Thumb Instructions Set - Integrater allocation - Conditional Instructions. Thumb Instructions - Integrate and Floating Point Arithmetic - Inline functior and Inline assembly- Portability issues.</li> <li>UNIT - II</li> <li>Hours: 09</li> <li>Optimizing Assembly Code - Profiling and cycle counting – instructions cheduling – Register allocation - condition Instruction - Condition and Interrupt handling. Performance issues.</li> <li>UNIT - IV</li> <li>Hours: 09</li> <li>Introduction to RTOS - Meeting real time constraints — Defining Struct Profiling Semaphores - Operations and Use - Defining Semaphores - Operations and Use -</li></ul>		Linbedded	ysterns		5			4	40	00	100
On successful completion of the course, the students will be able to:           Outcomes         I have skills in the Embedded System with real time constraints           UNIT - 1         Hours: 09           Embedded System - Other Hardware Units in the Embedded System - Software Embedded into a System - ARM Processor Families.         Hours: 09           Embedded System - Other Hardware Units in the Embedded System - Software Embedded into a System - ARM Processor Families.         Hours: 09           Quint - 1         Hours: 09           Ort System - Other Hardware Units in the Embedded System - Software Embedded System - Other Hardware Units in the Embedded System - Software Embedded System - Other Hardware Units in the Embedded System - Software Interrupts an Vector Table - Architecture Revision - ARM Processor Families.         Hours: 09           ARM Instruction - Set - Data Processing Instructions - Addressing Modes - Branch, Load, Store Instructions - Dat Processing Instructions - Single-Register and Multi Register Load-Store Instructions - Stack - Software Interrupt Instructions - ARM Programming using C: Simple C Program suging Function Calls - C-looping structures - Regista allocation - cundition esecution - looping constructs - bit manipulation - efficient switches - optimized primitives. Processes an Operating systems - Multiple tasks and processes - Context switching - Scheduling policies - Interproce: Communication mechanisms - Exception and interrupt handling - Performance issues.         Hours: 09           UNIT - II         IUIT - V         INIT - II         Hours: 09           Optinizing Assembly Code - Profiling and cycle counting - instruction schedu	Objectives	• To ii	ntroduce on Em	bedded F	Process develo	opment	Enviror	•	ssor and	Archite	ecture
Embedded Computing - Challenges of Embedded Systems – Embedded system design process - Processor Embedded System – Other Hardware Units in the Embedded System - Software Embedded into a System - AR Architecture: ARM Design Philosophy - Registers - Program Status Register - Instruction Pipeline - Interrupts an Vector Table - Architecture Revision - ARM Processor Families. UNIT – II	Outcomes	On successfu • Have	ul completion o e skills in the En	f the cou nbedded	rse, the stude C Programmi	nts will I ng	pe able	to:			
Embedded System – Öther Hardware Units in the Embedded System - Software Embedded into a System - ARI         Architecture: ARM Design Philosophy - Registers - Program Status Register - Instruction Pipeline - Interrupts an         Vector Table - Architecture Revision - ARM Processor Families.       Hours: 09         ARM Instruction Set - Data Processing Instructions - Addressing Modes - Branch, Load, Store Instructions - PS       Instructions - Conditional Instructions. Thumb Instructions Set - Register Usage - Other Branch Instructions - PS         Instructions - Single-Register and Multi Register Load-Store Instructions - Stack - Software Interrup       Interrup         Instructions - Single-Register and Multi Register Load-Store Instructions - Stack - Software Interrup       Interrupt         Instructions - ARM Programming using C: Simple C Programs using Function Calls - C-looping structures - Regista       allocation - Fordina and cycle counting - instruction scheduling Point Arithmetic- inline function and inline assembly-Portability issues.       Hours: 09         UNIT - III       Interrupts       Hours: 09         Optimizing Assembly Code - Profiling and cycle counting - instruction scheduling - Register allocation - condition execution - looping constructs - bit manipulation - efficient switches - optimized primitives. Processes an         Operating systems - Multiple tasks and processes - Context switching - Scheduling policies - Interproce: communication nechanisms - Exception and interrupt handling - Performance issues.       UNIT - V         Introduction to RTOS - Meeting real time constraints -Defining RTOS - The Scheduler - Objects	UNIT – I		-	•					H	lours: 0	9
Embedded System – Öther Hardware Units in the Embedded System - Software Embedded into a System - ARI         Architecture: ARM Design Philosophy - Registers - Program Status Register - Instruction Pipeline - Interrupts an         Vector Table - Architecture Revision - ARM Processor Families.       Hours: 09         ARM Instruction Set - Data Processing Instructions - Addressing Modes - Branch, Load, Store Instructions - PS       Instructions - Conditional Instructions. Thumb Instructions Set - Register Usage - Other Branch Instructions - PS         Instructions - Single-Register and Multi Register Load-Store Instructions - Stack - Software Interrup       Interrup         Instructions - Single-Register and Multi Register Load-Store Instructions - Stack - Software Interrup       Interrupt         Instructions - ARM Programming using C: Simple C Programs using Function Calls - C-looping structures - Regista       allocation - Fordina and cycle counting - instruction scheduling Point Arithmetic- inline function and inline assembly-Portability issues.       Hours: 09         UNIT - III       Interrupts       Hours: 09         Optimizing Assembly Code - Profiling and cycle counting - instruction scheduling - Register allocation - condition execution - looping constructs - bit manipulation - efficient switches - optimized primitives. Processes an         Operating systems - Multiple tasks and processes - Context switching - Scheduling policies - Interproce: communication nechanisms - Exception and interrupt handling - Performance issues.       UNIT - V         Introduction to RTOS - Meeting real time constraints -Defining RTOS - The Scheduler - Objects	Embedded Con	nputing - Cha	allenges of Eml	bedded S	Systems – En	nbedded	syster	n design i	process -	Proces	ssor in
ARM Instruction Set - Data Processing Instructions - Addressing Modes - Branch, Load, Store Instructions - PS Instructions - Conditional Instructions. Thumb Instruction Set - Register Usage - Other Branch Instructions - Dai Processing Instructions - Single-Register and Multi Register Load-Store Instructions - Stack - Software Interrup Instructions. ARM Programming using C: Simple C Programs using Function Calls – C-looping structures - Regista allocation – Function calls – Pointer aliasing – Structures - Integer and Floating Point Arithmetic- inline function and inline assembly– Portability issues. UNIT – III HU Hours: 09 Optimizing Assembly Code - Profiling and cycle counting – instruction scheduling – Register allocation – condition execution – looping constructs – bit manipulation – efficient switches – optimized primitives. Processes ar Operating systems - Multiple tasks and processes – Context switching – Scheduling policies – Interproce: communication mechanisms – Exception and interrupt handling - Performance issues. UNIT – V Hours: 09 Introduction to RTOS- Meeting real time constraints –Defining RTOS - The Scheduler - Objects – Services Characteristics of RTOS - Defining a Task - Tasks States and Scheduling - Task Operations – Structure Synchronization - Communication and Concurrency. Defining Semaphores - Operations and Use - Definir Message Queue - States – Content – Storage - Operations and Use. UNIT – V Hours: 09 Embedded System Development - Multi-state systems and function sequences. Embedded software development tools – Emulators and debugger. Design methodologies – Case studies – Windows CE – Linux 2.6x and RTLinux Coding and sending application layer byte stream on a TCP/IP network using RTOS Vxworks – Embedded system 2006. 2. Raj Kamal, Embedded Systems – Architecture, Programming and Design, 2nd Edition, McGraw-H companies, 2008. 3. Qing Li, Real Time Concepts for Embedded Systems, Elsevier, 2011. Reference Books: 1. Michael J. Pont, Embedded C, Pearson Education, 2007. 2. Wayne Wolf, Compute	Architecture: Al Vector Table - A	RM Design Ph	nilosophy - Regi	isters - Pi	rogram Status				peline - I	nterrup	ts and
Instructions - Conditional Instructions. Thumb Instruction Set - Register Usage - Other Branch Instructions - Dal Processing Instructions - Single-Register and Multi Register Load-Store Instructions - Stack - Software Interruy Instructions. ARM Programming using C: Simple C Programs using Function Calls – Clooping structures – Registe allocation – Function calls – Pointer aliasing – Structures - Integer and Floating Point Arithmetic– inline function and inline assembly– Portability issues. <b>UNIT – III Hours: 09</b> Optimizing Assembly Code - Profiling and cycle counting – instructions scheduling – Register allocation – condition execution – looping constructs – bit manipulation – efficient switches – optimized primitives. Processes ar Operating systems - Multiple tasks and processes – Context switching – Scheduling policies – Interproce: communication mechanisms – Exception and interrupt handling - Performance issues. <b>UNIT – IV Hours: 09</b> Introduction to RTOS- Meeting real time constraints –Defining RTOS - The Scheduler - Objects – Services Characteristics of RTOS - Defining a Task - Tasks States and Scheduling - Task Operations – Structure Synchronization - Communication and Concurrency. Defining Semaphores - Operations and Use - Definir Message Queue - States – Content – Storage - Operations and Use. <b>UNIT – V Hours: 09</b> Embedded System Development - Multi-state systems and function sequences. Embedded software development colos – Emulators and debuggers. Design methodologies – Case studies – Windows CE – Linux 2.6x and RTLinux Coding and sending application layer byte stream on a TCP/IP network using RTOS Vxworks – Embedded system for a smart card. <b>Total Total Tutorials: 15 Total Practical Classes: - Total Hours: 60</b> <b>Text Books:</b> 1. Andrew N Sloss, D. Symes and C. Wright, ARM System Developers Guide, Morgan Kaufmann / Elsevier 2006. 2. Raj Kamal, Embedded Systems – Architecture, Programming and Design, 2nd Edition, McGraw-H companies, 2008. 3. Qing Li, Real Time Concepts for E											
UNIT - III       Hours: 09         Optimizing Assembly Code - Profiling and cycle counting – instruction scheduling – Register allocation – condition execution – looping constructs – bit manipulation – efficient switches – optimized primitives. Processes ar Operating systems - Multiple tasks and processes – Context switching – Scheduling policies – Interproce: communication mechanisms – Exception and interrupt handling - Performance issues.         UNIT – IV       Hours: 09         UNIT – IV       Hours: 09         UNIT – IV       Hours: 09         Unitroduction to RTOS- Meeting real time constraints –Defining RTOS - The Scheduler - Objects – Services       Characteristics of RTOS - Defining a Task - Tasks States and Scheduling - Task Operations – Structure         Synchronization - Communication and Concurrency. Defining Semaphores - Operations and Use - Defining       Hours: 09         UNIT – V       Hours: 09         Embedded System Development - Multi-state systems and function sequences. Embedded software development cols – Emulators and debuggers. Design methodologies – Case studies – Windows CE – Linux 2.6x and RTLinux Coding and sending application layer byte stream on a TCP/IP network using RTOS Vxworks – Embedded system for a smart card.         Total contact Hours: 45       Total Tutorials: 15       Total Practical Classes: -       Total Hours: 60         1       Andrew N Sloss, D. Symes and C. Wright, ARM System Developers Guide, Morgan Kaufmann / Elsevie 2006.       Raj Kamal, Embedded Systems – Architecture, Programming and Design, 2nd Edition, McGraw-H companies, 2008.       Qing Li, Real Time Co	Processing Insti Instructions. AR allocation – Fur	ructions - Sin M Programm action calls –	gle-Register an ing using C: Sin Pointer aliasing	d Multi f nple C Pr	Register Load ograms using	-Store Ir Functio	nstructi n Calls	ons - Stac – C-loopin	k - Softw g structu	vare Int res – Re	errupt egister
Optimizing Assembly Code - Profiling and cycle counting – instruction scheduling – Register allocation – condition         execution – looping constructs – bit manipulation – efficient switches – optimized primitives. Processes ar         Operating systems - Multiple tasks and processes – Context switching – Scheduling policies – Interproce:         communication mechanisms – Exception and interrupt handling - Performance issues.         UNIT – IV       Hours: 09         Introduction to RTOS- Meeting real time constraints –Defining RTOS - The Scheduler - Objects – Services         Characteristics of RTOS - Defining a Task - Tasks States and Scheduling - Task Operations – Structure         Synchronization - Communication and Concurrency. Defining Semaphores - Operations and Use - Definir         Message Queue - States – Content – Storage - Operations and Use.         UNIT – V       Hours: 09         Embedded System Development - Multi-state systems and function sequences. Embedded software development tools – Emulators and debuggers. Design methodologies – Case studies – Windows CE – Linux 2.6x and RTLinux Coding and sending application layer byte stream on a TCP/IP network using RTOS Vxworks – Embedded system for a smart card.         Total contact Hours: 45       Total Tutorials: 15       Total Practical Classes: -       Total Hours: 60         Text Books:       .       Andrew N Sloss, D. Symes and C. Wright, ARM System Developers Guide, Morgan Kaufmann / Elsevie 2006.       Raj Kamal, Embedded Systems – Architecture, Programming and Design, 2nd Edition, McGraw-H companies, 2008.       .			111 135023.						н	lours: 0	9
execution – looping constructs – bit manipulation – efficient switches – optimized primitives. Processes ar Operating systems - Multiple tasks and processes – Context switching – Scheduling policies – Interproces communication mechanisms – Exception and interrupt handling - Performance issues. UNIT – IV Hours: 09 Introduction to RTOS - Meeting real time constraints –Defining RTOS - The Scheduler - Objects – Services Characteristics of RTOS - Defining a Task - Tasks States and Scheduling - Task Operations – Structure Synchronization - Communication and Concurrency. Defining Semaphores - Operations and Use - Definin Message Queue - States – Content – Storage - Operations and Use. UNIT – V Hours: 09 Embedded System Development - Multi-state systems and function sequences. Embedded software development tools – Emulators and debuggers. Design methodologies – Case studies – Windows CE – Linux 2.6x and RTLinux Coding and sending application layer byte stream on a TCP/IP network using RTOS Vxworks – Embedded systee for a smart card. Total contact Hours: 45 Total Tutorials: 15 Total Practical Classes: - Total Hours: 60 Text Books: 1. Andrew N Sloss, D. Symes and C. Wright, ARM System Developers Guide, Morgan Kaufmann / Elsevie 2006. 2. Raj Kamal, Embedded Systems – Architecture, Programming and Design, 2nd Edition, McGraw-H companies, 2008. 3. Qing Li, Real Time Concepts for Embedded Systems, Elsevier, 2011. <b>Reference Books:</b> 1. Michael J. Pont, Embedded C, Pearson Education, 2007. 2. Wayne Wolf, Computers as Component: Principles of Embedded Computer System Design, 2nd Editio 2008. 3. Steve Heath, Embedded System Design, Elsevier, 2nd Edition, 2003.		mbly Codo	Profiling and av	cla counti	ng _ instructi	on schor	huling -	Pogistor			
Introduction to RTOS- Meeting real time constraints –Defining RTOS - The Scheduler - Objects – Services Characteristics of RTOS - Defining a Task - Tasks States and Scheduling - Task Operations – Structure Synchronization - Communication and Concurrency. Defining Semaphores - Operations and Use - Definin Message Queue - States – Content – Storage - Operations and Use. UNIT – V Hours: 09 Embedded System Development - Multi-state systems and function sequences. Embedded software development tools – Emulators and debuggers. Design methodologies – Case studies – Windows CE – Linux 2.6x and RTLinux Coding and sending application layer byte stream on a TCP/IP network using RTOS Vxworks – Embedded system for a smart card. Total contact Hours: 45 Total Tutorials: 15 Total Practical Classes: - Total Hours: 60 Text Books: 1. Andrew N Sloss, D. Symes and C. Wright, ARM System Developers Guide, Morgan Kaufmann / Elsevie 2006. 2. Raj Kamal, Embedded Systems – Architecture, Programming and Design, 2nd Edition, McGraw-H companies, 2008. 3. Qing Li, Real Time Concepts for Embedded Systems, Elsevier, 2011. <b>Reference Books:</b> 1. Michael J. Pont, Embedded C, Pearson Education, 2007. 2. Wayne Wolf, Computers as Component: Principles of Embedded Computer System Design, 2nd Edition 2008. 3. Steve Heath, Embedded System Design, Elsevier, 2nd Edition, 2003.	Operating syste communication	ems - Multip	le tasks and p	processes	– Context s	switching	g – Sc	heduling p	olicies –	- Interp	rocess
Characteristics of RTOS - Defining a Task - Tasks States and Scheduling - Task Operations – Structure Synchronization - Communication and Concurrency. Defining Semaphores - Operations and Use - Definin Message Queue - States – Content – Storage - Operations and Use. UNIT - V Hours: 09 Embedded System Development - Multi-state systems and function sequences. Embedded software development tools – Emulators and debuggers. Design methodologies – Case studies – Windows CE – Linux 2.6x and RTLinux Coding and sending application layer byte stream on a TCP/IP network using RTOS Vxworks – Embedded system for a smart card. Total contact Hours: 45 Total Tutorials: 15 Total Practical Classes: - Total Hours: 60 Text Books: 1. Andrew N Sloss, D. Symes and C. Wright, ARM System Developers Guide, Morgan Kaufmann / Elsevie 2006. 2. Raj Kamal, Embedded Systems – Architecture, Programming and Design, 2nd Edition, McGraw-H companies, 2008. 3. Qing Li, Real Time Concepts for Embedded Systems, Elsevier, 2011. Reference Books: 1. Michael J. Pont, Embedded C, Pearson Education, 2007. 2. Wayne Wolf, Computers as Component: Principles of Embedded Computer System Design, 2nd Edition 2008. 3. Steve Heath, Embedded System Design, Elsevier, 2nd Edition, 2003.											-
UNIT - V       Hours: 09         Embedded System Development - Multi-state systems and function sequences. Embedded software development tools – Emulators and debuggers. Design methodologies – Case studies – Windows CE – Linux 2.6x and RTLinux Coding and sending application layer byte stream on a TCP/IP network using RTOS Vxworks – Embedded system for a smart card.         Total contact Hours: 45       Total Tutorials: 15       Total Practical Classes: -       Total Hours: 60         Text Books:       1.       Andrew N Sloss, D. Symes and C. Wright, ARM System Developers Guide, Morgan Kaufmann / Elsevie 2006.       2.       Raj Kamal, Embedded Systems – Architecture, Programming and Design, 2nd Edition, McGraw-H companies, 2008.       3.       Qing Li, Real Time Concepts for Embedded Systems, Elsevier, 2011.         Reference Books:       1.       Michael J. Pont, Embedded C, Pearson Education, 2007.       2.       Wayne Wolf, Computers as Component: Principles of Embedded Computer System Design, 2nd Edition 2008.         3.       Steve Heath, Embedded System Design, Elsevier, 2nd Edition, 2003.       3.	Characteristics Synchronization	of RTOS - E 1 - Communi	Defining a Tasl cation and Co	k - Tasks ncurrenc	s States and y. Defining S	Schedu Semapho	ling -	Task Ope	rations -	- Struc	ture –
<ul> <li>tools – Emulators and debuggers. Design methodologies – Case studies – Windows CE – Linux 2.6x and RTLinux Coding and sending application layer byte stream on a TCP/IP network using RTOS Vxworks – Embedded system for a smart card.</li> <li>Total contact Hours: 45 Total Tutorials: 15 Total Practical Classes: - Total Hours: 60</li> <li>Text Books: <ol> <li>Andrew N Sloss, D. Symes and C. Wright, ARM System Developers Guide, Morgan Kaufmann / Elsevie 2006.</li> <li>Raj Kamal, Embedded Systems – Architecture, Programming and Design, 2nd Edition, McGraw-H companies, 2008.</li> <li>Qing Li, Real Time Concepts for Embedded Systems, Elsevier, 2011.</li> </ol> </li> <li>Reference Books: <ol> <li>Michael J. Pont, Embedded C, Pearson Education, 2007.</li> <li>Wayne Wolf, Computers as Component: Principles of Embedded Computer System Design, 2nd Edition 2008.</li> <li>Steve Heath, Embedded System Design, Elsevier, 2nd Edition, 2003.</li> </ol> </li> </ul>	UNIT – V								H	lours: 0	9
<ol> <li>Text Books:         <ol> <li>Andrew N Sloss, D. Symes and C. Wright, ARM System Developers Guide, Morgan Kaufmann / Elsevie 2006.</li> <li>Raj Kamal, Embedded Systems – Architecture, Programming and Design, 2nd Edition, McGraw-H companies, 2008.</li> <li>Qing Li, Real Time Concepts for Embedded Systems, Elsevier, 2011.</li> </ol> </li> <li>Reference Books:         <ol> <li>Michael J. Pont, Embedded C, Pearson Education, 2007.</li> <li>Wayne Wolf, Computers as Component: Principles of Embedded Computer System Design, 2nd Edition 2008.</li> <li>Steve Heath, Embedded System Design, Elsevier, 2nd Edition, 2003.</li> </ol> </li> </ol>	Embedded Syste tools – Emulato Coding and sen for a smart card	rs and debug ding applicati	gers. Design me on layer byte s	ethodolo stream or	gies – Case st n a TCP/IP ne	twork us	Windo sing RT	ws CE – Lir OS Vxworl	software nux 2.6x ks – Emb	develo and RTL edded s	pment .inux —
<ol> <li>Andrew N Sloss, D. Symes and C. Wright, ARM System Developers Guide, Morgan Kaufmann / Elsevie 2006.</li> <li>Raj Kamal, Embedded Systems – Architecture, Programming and Design, 2nd Edition, McGraw-H companies, 2008.</li> <li>Qing Li, Real Time Concepts for Embedded Systems, Elsevier, 2011.</li> <li>Reference Books:         <ol> <li>Michael J. Pont, Embedded C, Pearson Education, 2007.</li> <li>Wayne Wolf, Computers as Component: Principles of Embedded Computer System Design, 2nd Edition 2008.</li> <li>Steve Heath, Embedded System Design, Elsevier, 2nd Edition, 2003.</li> </ol> </li> </ol>		ours: 45	iotal Iutorials	: 15	I OTAL Practica	al Classe	s: -	Iotal	Hours: 6	U	
<ol> <li>Reference Books:         <ol> <li>Michael J. Pont, Embedded C, Pearson Education, 2007.</li> <li>Wayne Wolf, Computers as Component: Principles of Embedded Computer System Design, 2nd Edition 2008.</li> <li>Steve Heath, Embedded System Design, Elsevier, 2nd Edition, 2003.</li> </ol> </li> </ol>	<ol> <li>Andrew 2006.</li> <li>Raj Kar compar</li> </ol>	nal, Embedd nies, 2008.	ed Systems –	Architec	ture, Program	nming a	and De	-			
<ol> <li>Michael J. Pont, Embedded C, Pearson Education, 2007.</li> <li>Wayne Wolf, Computers as Component: Principles of Embedded Computer System Design, 2nd Edition 2008.</li> <li>Steve Heath, Embedded System Design, Elsevier, 2nd Edition, 2003.</li> </ol>				- 1	,						
	<ol> <li>Michael</li> <li>Wayne</li> <li>2008.</li> </ol>	l J. Pont, Emb Wolf, Compu	ters as Compo	nent: Pri	nciples of Em			uter Syster	n Design	, 2nd E	dition,
NA / - E	3. Steve H Websites: -	eath, Embedd	ied System Des	ign, Elsev	ier, zna Editio	on, 2003	•				