

Scheme – 2017

M.Tech Syllabus

Department of Computer Science and Engineering G. Pulla Reddy Engineering College (Autonomous): Kurnool Accredited by NBA of AICTE and NAAC of UGC Affiliated to JNTUA, Anantapuramu

Two year M.Tech Course (Scheme – 17)

Scheme of instruction and Examination

(Effective from 2017-18)

M.Tech I Semester

COMPUTER SCIENCE AND ENGINEERING

S No	Course	Course Title		Sci Ins perie	heme o tructio ods/we	of n eek	Scheme of Examination			
	Code		Credits	L	т	Ρ	End Exam Marks	Internal Assessment Marks	Total Marks	
1.	CS801	Advanced Data Structures& Algorithms	4	4	-	-	60	40	100	
2.	CS802	Software Project Management	3	3	-	-	60	40	100	
3.	CS803	Advanced Computer Networks	3	3	-	-	60	40	100	
4.		Elective-I	3	3	-	-	60	40	100	
5.		Elective –II	3	3	-	-	60	40	100	
6.	AU101	Technical English	-	2	-		-	-	-	
7.	CS804	Software Lab – I	2	-	-	3	50	50	100	
8.	CS805	Software Lab – II	2	-	-	3	50	50	100	
			20	18	-	6	400	300	700	

M. 7	M.Tech II Semester						COMPUTER SCIENCE AND ENGINEERING						
5 No	Course			Sch Inst perio	eme o ructio ds/we	of on eek	Scheme of Examination						
Code		Course fille	Credits	L	т	Ρ	End Exam Marks	Internal Assessment Marks	Total Marks				
1.	CS815	Artificial Intelligence	3	3	-	-	60	40	100				
2.	CS816	Cloud Computing	3	3	-	-	60	40	100				
3.	CS817	Data Science	4	4	-	-	60	40	100				
4.		Elective-III	3	3	-	-	60	40	100				
5.		Elective-IV	3	3	-	-	60	40	100				
6.	AU102	Research Methodology	-	2	-	-	-	-	-				
7.	CS818	Software Lab – III	2	-	-	3	50	50	100				
8.	CS819	Software Lab – IV	2	-	-	3	50	50	100				
			20	18	-	6	400	300	700				

M.Tech III & IV Semester

COMPUTER SCIENCE AND ENGINEERING

S No	Course Code	Course Title	Crodits	Scheme of Instruction periods/week			Scheme of Examination		
			creats	L	т	Ρ	End Exam Marks	Internal Assessment Marks	Total Marks
1.	CS901	Dissertation	12	-	-	-	50	50	100

Description	Subject title	Code
	1. Service Oriented Architecture & Web Services	CS806
Elective-I	2. Embedded System	CS807
Elective-I	3. Advanced Database Management Systems	CS808
	4. Natural Language Processing	CS809
	1.Soft Computing	CS810
	2. High Performance Computing	CS811
Elective II	3. Image and Video Processing	CS812
	4. Mobile Adhoc Networks	CS813
	5.Advanced Computer Architecture	CS814
	1. Machine and Deep Learning	CS820
	2. Software Quality and Testing	CS821
Elective III	3. Computer vision	CS822
	4. Internet of Things	CS823
	5. Information Retrieval System	CS824
	1. OOAD & Design Patterns	CS825
Elective IV	2. Cyber Security	CS826
Elective IV	3. Mobile Applications Development	CS827
	4. Free Open Source Software	CS828

ADVANCED DATA STRUCTURES AND ALGORITHMS (ADSA)

I Semester :CSE						Scheme	: 2017			
Course Code	Hours	/Week		Credits	Maximum Marks					
					Continuous					
CS801	L	Т	Р	С	Internal	End Exam	TOTAL			
	3		-	3	Assessment 40	60	100			
Sessional Exam Dura	tion : 2	Hrs		5	End Exa	m Duration: 3	Hrs			
Course Outcomes : At	t the end	of the c	ourse	e the studen	t will be able to					
CO1: Understand the op	erations	and app	licatio	ons of basic	e data structures.					
CO2: Explain non linear	data stru	ictures -	binar	y trees, bin	ary search tree, AV	L trees, B trees	,			
Red-Black trees an	nd splay	trees.								
CO3: Understand the operations of heaps and their applications.										
CO4: Organize the data in the computer memory using hash functions										
CO5: Analyze the time complexities of algorithms for solving problems										
Overview of Linear Data	i Structu	res:								
Review of Arrays, Linked lists, Stacks, Queues- Operations and applications.										
Non Linear Data Struct	ures –1r	ees:	-	raala Thra	dad hinary trace	Dinamy Saarah	Troop AVI			
Trees B Trees Red Bl	s, Dillar	y tree I	. ravei	Trees On	erations and applic	ations	Trees, AVL			
Driverity Outputs			opiay	nees - Op	erations and applie	ations.				
Priority Queues(Heaps):	Mov Ho	and on	rotio	na and ann	liantions d hanne	Laftist hasns	Show boons			
and Binomial Queues	Max ne	aps, ope		iis and app	incations. u-neaps,	Lettist neaps,	skew neaps			
Hash Tables. Introducti	on Has	h Funct	ions	Hashing '	Fechniques-Open 1	Hashing (senar	ate chaining			
method) Closed Hashing	$\frac{1011}{2}$ (open a	ddressir	roms,	ehashing a	nd Extendible Has	ning (separa	ate channing			
Divide and Conquer: (General N	Method.	Bina	rv Search.	Finding Maximum	and Minimum	n. Strassen [*] 's			
Matrix Multiplication.		,		,	8		,			
Dynamic Programming	:Genera	l Metho	d, Al	l Pairs Sho	rtest Path, 0 / 1 Kn	apsack problem	, Reliability			
Design, Traveling Sales I	Person''s	Problem	n.				-			
Back Tracking: General	Method	, 8 – Qu	een"s	Problem,	Graph Coloring.					
Text Books :										
1. Data Structures Using	g C and O	C++by	Yedio	dyahLangsa	am , Moshe J. Auge	enstein, Aaron	М.			
Tenenbaum Pearson	Education	on.			-					
2. Fundamentals of Com	puter Alg	gorithm	s by E	Ellis Horow	itz					
Defenence Deeler										
Kelerence Books :	hu D G	lomonto								
1. Classic Data Structure	s by D. 2		. 4 1	he he he						
2. Design and Analysis o	2. Design and Analysis of Computer Algorithms by Ano									
3. Introduction to the Des	$\frac{1}{5}$ Algorithm $\frac{1}{5}$	Analysi		Algorithms	by Goodman					
4. Design and Analysis o	1 Algorit	lnms by	E. H	orowitz						
Question Paner Pattern	Question Paper Pattern:									
InternalAssessment · T	• he quest	ion nan	er for	r internal e	xamination shall o	onsist of Six of	uestions and			
has to answer any Four questions for 10 marks each										
	•	-								
EndExam: The question	n paper f	for end e	exami	ination shal	l consist of Eight of	questions and h	as to answer			
any Five questions for 1	2 mortes	aaah								

any Five questions for 12 marks each

SOFTWARE PROJECT MANAGEMENT (SPM)

I Semester :CSE						Scheme	: 2017		
Course Code	Hours	Week		Credits	Max	imum Marks			
					Continuous				
C5202	L	Т	Р	С	Internal	End Exam	TOTAL		
C3002					Assessment				
	3	-	-	3	40	60	100		
Sessional Exam Dura	tion:2	Hrs			End Exa	m Duration: 3	Hrs		
Course Outcomes : A	t the end	of the c	ourse	the studer	it will be able to				
CO1: Understand the Pro	ocesses,	Project	Mana	gement, C	apability Maturity N	Model and Proje	ect Planning		
Infrastructure.									
CO2: Define standard pr	ocess, pi	cocess ta	ulorir	ig and char	ige management pr	ocess.			
CO3: Estimate effort of	software	project	using	g bottom-uj	b, top-down and use	e case points ap	proach.		
CO4: Determine schedul	le of soft	ware pr	oject	using over	all scheduling and c	letailed schedul	ing.		
CO5: Describe risk management activities, measurements and project tracking.									
CO6: Explain team management, project management plan and configuration management process.									
CO7: Understand review process, project monitoring and milestone analysis.									
	• .								
Managing Software Pro	<i>jects:</i>	nt Duci		~~~~~	and the CMM Dre	is at Managama	at at Info area		
Processes and Project Ma	anageme	nt, Proje	ect ma	anagement	and the CMM, Pro	ject Manageme	nt at infosys.		
Project Planning: Proje	ct Plann	nng m Dodvof	rastru V mor	icture, In	e Process Daladas	se, The Proces	s Capability		
Basenne, Process Assets	and the	Body of	Knov	wiedge Sys	stem.				
Process Planning:		Char	N	[Duo oo oo Dionnin o	for the ACIC D	un in at		
Effort Estimation and		ent Chai	Ige M	nation	d Schoduling Co	Tor the ACIC P	Tojeci.		
Scheduling Quality Pla	nning: (uung. Mality (Conce	nation an	titative Quality M	anagement Play	Defect		
Prevention Planning	inning. Ç	<i>zuanty</i>	Conce	epis, Quan	manve Quanty Ma	anagement 1 lai	ining, Delect		
Rick Management and I	Project N	lanaga	nont	Plan.					
Concepts Risk Assess	sment	Risk (ontro	l <i>un.</i> I Measu	ement and Track	zing Planning	Concepts		
Measurements Project 7	Tracking	Team	Mana	gement C	ustomer Communic	vation and Issue	Resolution		
Structure of Project M	anageme	nt Plan		nfiguration	Management [.] Co	ncents The C	onfiguration		
Management Process	unugenne	int i num		inguiation	Munugement. et		oninguration		
Reviews : The Review Pi	rocess D	ata Col	lectio	n Monitor	ing and Control Ir	troduction of F	Reviews and		
the NAH syndrome Pro	niect Mo	nitoring	and	Control· P	roject Tracking M	ilestone Analy	sis - Actual		
versus Estimated Analys	is Monit	toring (mality	V Risk-Rel	ated Monitoring				
Versus Estimated 7 marys.	15, 1010111		uuni		ated monitoring.				
Text Books :									
1. Pankaj Jalote [20	02], Soft	ware Pr	oject	Manageme	ent in Practice, Pea	rson Education.			
2. Walker Royce [1998], Software Project Management, Pearson Education.									
Reference Books :									
1. Sommerville [200	8], [7 th E	dition],	Softw	vare Engine	eering, Pearson Edu	ication.			
2. Roger S.Pressman	[2005],	$[6^{th} Ed$	lition]	, Software	Engineering, A Pr	ractitioner's Ap	proach, Mc		
GrawHill Internati	onal Edi	tion.							
Question Paper Pattern	:								

InternalAssessment: The question paper for internal examination shall consist of **Six** questions and has to answer any **Four** questions for 10 marks each

ADVANCED COMPUTER NETWORKS (ACN)

						C. L.	2017			
1 Semester :CSE	/**/				Scheme	: 2017				
Course Code	Hours	vveek		Credits	Max	imum Marks				
	-		-	G	Continuous					
CS803	L	T	P	C	Internal	End Exam	TOTAL			
					Assessment		100			
	3	-	-	3	40	60	100			
Sessional Exam Dura	tion:2	Hrs			End Exa	m Duration: 3	Hrs			
Course Outcomes : A	t the end	of the c	course	e the studer	t will be able to					
CO1: Understand history	of Inter	net inclu	ıding	basics of I	SPs, Internet Backb	oones.				
CO2: Explain layered mo	odels, Int	ernet ac	ldress	ing versior	s IPv4, IPv6.					
CO3: Describe protocols	TCP, U	DP, Mo	bile T	CP, HTTP	, FTP, SMTP, DNS	b .				
CO4: Understand IEEE 8	302.11 W	LAN te	chno	logies inclu	ding cellular netwo	orks, mobile IP.				
CO5: Understand Wirele	ss Senso	r Netwo	orks V	VPNs and ()verlav Networks					
COS: Understand whereas Sensor Networks, VENs and Overlay Networks.										
Review of Computer Net	tworks a	nd the l	ntorn	ot.						
What is the Internet ISP	s and Int	ernet R	nie n ackho	nes Histor	v of Computer Net	working and the	Internet			
Fundamentals of NS2.										
Foundation of Networking Protocols:										
5-laver TCP/IP Model. 7	5-layer TCP/IP Model 7-I aver OSI Model I ogical Addressing: IPv4 Addresses IPv6 Addresses									
Internet Protocol: Internetworking, IPv4, IPv6, Transition from IPv4 to IPv6.										
Transport and End-to-E	nd Prote	$\frac{1}{2}$,		•				
Transport Laver, Trans	mission	Contro	ol Pro	otocol (TC	P) User Datagra	m Protocol ()	UDP) TCP			
Congestion Control and	Mobile	TCP. A	pplic	ation Lave	": Principles of Net	twork Applicat	ions. HTTP.			
FTP. SMTP and DNS.			rr	j .			,,			
Wireless Network and M	lobile IP									
Infrastructure of Wireles	ss Netwo	orks, W	reles	s LAN Te	chnologies, IEEE	802.11 Wireles	ss Standard,			
Cellular Networks, Mobi	le IP.	,			e ,		,			
Wireless Sensor Network	ks ,VPN	s and C	verla	y Network	s:					
Sensor Networks and	Protocol	Struct	ures,	Communi	cation Energy Mc	del, Clustering	g Protocols,			
Routing Protocols, Virtua	l Private	Netwo	rks (V	PNs), Ove	rlay Networks.					
					•					
Text Books :										
1. Behrouz A.Forouza	an, [4 th Eo	lition], L	Data C	Communicati	onsandNetworking,T	ataMcGrawHill,	2007.			
2. Jochen Schiller, [[2011], <i>N</i>	Iobile C	Comm	unications,	Pearson Education					
3. Computer Netwo	rking: A	Top-Do	wn A	pproach F	eaturing the Intern	et, James F. Ki	urose, Keith			
W.Ross, Third Ed	lition, Pe	earson E	Educa	tion, 2007						
Reference Books :										
1. Computer Network	ks, Andro	ew S. Ta	anenb	aum, Fourt	h Edition, Prentice	Hall.				
2. An Engineering Approach to Computer Networks, S. Keshar, II Edition, Pearson Ed.										
3. Computer and Co	3. Computer and Communication Networks, Nader F. Mir, Pearson Education, 2007									
-										
Question Paper Pattern	Question Paper Pattern:									
InternalAssessment: T	he quest	ion pap	er for	r internal e	xamination shall co	onsist of Six q	uestions and			
has to answer any Four	question	ns for 10	mark	ks each		-				
EndExam: The question	n paper f	for end	exami	ination sha	ll consist of Eight of	questions and h	as to answer			

any Five questions for 12 marks each

SERVICE ORIENTED ARCHITECTURE & WEB SERVICES (SOAWS)

Elective-I for M.Tech (CSE					Scheme	: 2017			
CourseCode	Hours	/Week		Credits	dits MaximumMarks					
					Continuous					
CS806	L	Т	Р	С	Internal	EndExam	TOTAL			
	3	-	-	3	40	60	100			
SessionalExamDurat	tion:2Hr	S			End Exa	mDuration:3H	Irs			
Course Outcomes :At	the end	of the c	ourse	the studen	t will be able to					
CO1: Understand the ba	sics of S	ervice (Driente	ed Archited	cture.					
CO2: Remember the prin	ciples of	Service	Orier	nted Archit	ecture.					
CO3: Understand the fra	amework	of Web	o servi	ices and Se	rvice Oriented Arch	nitecture.				
CO4: Discuss the operati	ons of we	eb servic	ces and	d its tools.						
CO5: Describe the web s	ervices a	rchitectu	re.							
CO6: Demonstrate the i	mplemen	itation c	of web	services.						
SOA, Benefits of SOA E evolution of SOA(Sta Past architectures).	A, A SO	A time ganizat	line (ionsai	(from XM ndContribu	L to Web Service tingvendors),Therc	es to SOA),The potsofSOA(com	e Continuing paringSOAtc			
Principles of Service: oriented architecture, Corientation, Service laye	Orientat Common r abstrac	tion: So Princij tion, Bu	ervice ples c siness	es-orientation of Service s service la	on and the enterp orientation, Servio yer, Orchestration	orise, Anatomy ce orientation service layer.	of a service- and Object-			
Web Services and SOA: The Web services frame WSDL), Messaging (Choreography.	ework, Sowith SC	ervices(DAP), 7	as We Fransa	eb Services actions, Co	s), Service Registry oordination, Busin	y, Service descr ness Activity, C	iptions (with Drchestration,			
<i>Introduction to Web Set</i> The of web services, services, benefits and ch	rvices: basic ope allenges	erationa of using	l mod g web	lel of web services.	services, tools and	technologies e	enabling web			
Web Services Architec Web Services Archite	<i>ture:</i> ecture,	Web	servic	ces Archi	tecture and its of	characteristics,c	ore building			

Web Services Architecture, Web services Architecture and its characteristics, core building blocksofweb services, standards and technologies available for implementing webservices, webservices communication, basicsteps of implementing webservices, developing web services enabled applications.

Text Books :

- 1. Service-Oriented Architecture Concepts and Technology and Design, ThomasErl, Pearson Education, 2005.
- 2. Developing Java Web Services, R.Nagappan, R.Skoczylas, R.P.Sriganesh, WileyIndia, rp-2008.
- 3. Developing EnterpriseWeb Services, S. Chatterjee, J. Webber, Pearson Education, 2008.
- 4. XML, WebServices, and the Data Revolution, F.P. Coyle, Pearson Education.

Reference Books :

- 1. IT Architecture and Middleware, Strategies for Building Large Integrated Systems, ChrisBritton, ISBN0-201-70907-4.
- 2. Understanding SOAwith Web Services, Eric Newcomer, Greg Lomow, Pearson Education, 2005.
- 3. Building Web Services with Java, Second Edition, S.Grahamand others, Pearson Edn., 2008.
- 4. Java Web Services, D.A. Chappelland T.Jewell, O,,Reilly, SPD.
- 5. Java WebServices Architecture, McGovern, et al., Morgan Kaufmann Publishers, 2005.

QuestionPaperPattern:

InternalAssessment:Thequestionpaperforinternalexaminationshallconsistof**Six**questionsand has to answer any **Four** questionsfor10marks each

EMBEDDED SYSTEMS (ES)

Elective-I for M.Tech (CSE					Scheme	: 2017	
Course Code	e Hours/Week			Credits	Max	imum Marks		
CS807	L	Т	Р	С	Continuous Internal	End Exam	TOTAL	
	3		_	3		60	100	
Sessional Evam Dura	$\frac{3}{100 \cdot 2}$	- Hrs	-	5	Fnd Eva	m Duration: 3	Hrs	
		1115				In Duration. 5	1115	
Course Outcomes · A	t the end	of the c	ourse	the studer	t will be able to			
CO1: Understand design	nrocess	of the e	edde	d systems	Complex systems	with formalism	IS	
CO2: Understand 8051	nicro-coi	or Eine ntroller	archit	ecture cor	npopents of a micro	o-controller and	their	
interactions to I/O	in an int	errupt d	riven	multi threa	ad environment.		i then	
CO3: Understand advan	ced proce	essor arc	chitec	tures with	real world Interfaci	ng. Devices and	d	
Communication B	uses for]	Networl	ked er	nbedded s	vstems.		-	
CO4: Explain software programming concepts in Assembly language. High level languages and								
embedded program	nming in	C & C-	⊦+.			00		
CO5: Understand Real-7	Fime Ope	erating S	Syster	n Architec	ture, services, RTO	S programming	g functions,	
RTOS VxWorks, Windows CE.								
CO6: Describe programming environment to develop embedded systems and its debugging								
techniques.								
 Introduction to Embedded Systems: Embedded Systems, Complex Systems and Microprocessors, Embedded System Design Process, Complex System Design, Formalisms of System Design, Design Examples. 8051 Architecture: 8051 Architecture: 8051 Architecture; 8051 Micro controller Hardware, Input/Output Ports and Circuits, External Memory, Counter and Timers, Serial data Input/Output, Interrupts (To be referred from The 8051 Microcontroller, Third Edition, Kenneth J.Ayala, Thomson). Advanced Processor Architectures: Introduction, Real World Interfacing, Processor and Memory organization, Serial and parallel Devices & ports, Wireless Devices, Timer and Counting Devices, Watchdog Timer, Real Time Clock, Networked Embedded Systems, Internet Enabled Systems, Wireless and Mobile System protocols. Embedded Programming Concepts: Software programming in Assembly language and High Level Language, Data types, Structures, Modifiers, Loops and Pointers, Macros and Functions, object oriented Programming, Embedded Programming in C++ & JAVA.(refer IV, V and VI chapters of The 8051 Microcontroller, Third Edition, Kenneth J.Ayala, Thomson). 								
 Real – Time Operating Systems: Introduction to RTOS, RTOS Architecture,OS Services, Basic Design Using an RTOS, Response of Task as Performance Metrics, Types of RTOSES, RTOS VxWorks, RTOS Programming functions, Windows CE, Real Time operating system issues with respect to embedded system applications. Embedded Software Development Process and Tools: Introduction to Embedded Software Development Process and Tools, Host and Target Machines, Linking and Locating Software, Getting Embedded Software into the Target System, Testing on Host Machine, Simulators, Using Laboratory Tools. 								
Text Rooks .								
Text Books : 1.Wayne Wolf (2008), Computers as Components-principles of embedded computer system design, Elseveir, New Delhi, India.								
2. The SUDI Microcol	uroner, 1	mar Da	uuon,	Simon D	Ayaia, Inomson			
5. All Ellibedded Soft	ware PTI	ner, Da	viu E	. Sinton, P	carson Education.			

Reference Books :

1. Embedded/Real-Time Systems, Dr.K.V.K.K.Prasad, dreamTech press.

2. The 8051 Microcontroller and Embedded Systems, Muhammad Ali Mazidi, Pearson.

3. Embedded Systems, Raj Kamal, Second Edition TMH.

4.Micro Controllers, Ajay V Deshmukhi, TMH.

Question Paper Pattern:

InternalAssessment: The question paper for internal examination shall consist of **Six** questions and has to answer any **Four** questions for 10 marks each

ADVANCED DATABASE MANAGEMENT SYSTEMS(ADBMS)

Elective-I for M.Tech C	SE					Scheme	: 2017			
Course Code	Hours	/Week		Credits	Max	imum Marks				
CS808	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL			
	3	-	-	3	40	60	100			
Sessional Exam Dura	tion:2	Hrs			End Exa	m Duration: 3	Hrs			
Course Outcomes : At	t the end	of the c	ourse	the studer	t will be able to					
CO1: To Measure the co	$\frac{\text{st of sele}}{Comple}$	ection, j	oin ar	nd sort que	ry operations.	in databasas				
CO3: To Determine the	differenc	ze betwe	en ce	ntralized a	nd client-server arc	hitectures				
CO4: To Describe the ne	ed of Pa	rallelisr	n in d	listributed of	latabases.	intectures.				
CO5: To Understand tim	CO5: To Understand time series, spatial, geographic and multimedia databases.									
CO6: To Understand real time transaction management.										
<i>Query processing and Query Optimization:</i> Measures of Query cost, Selection operation, sorting, join operation, other operations Evaluation of expressions, Transformation of relational expressions, Estimating statistics of expression, choice of evaluation plans. <i>Object Based Databases and XML:</i> Complex Data types. Structured types and Inheritance in SOL										
<i>Object Based Databases and XML:</i> Complex Data types, Structured types and Inheritance in SQL. Table inheritance, Array and Multi set types in SQL, Object identity and reference types in SQL, Implementing O-R features .Persistent Programming Languages, Object-Oriented v/s Object relational. Database System Architecture: Centralized and Client–server Architectures, server system architectures Parallel and Distributed systems.										
Parallel Databases: Intro operation parallelism, Int Distributed Databases Distributed Transaction Availability, Distributed	oduction er opera : Homo s, Com query pr	, I/O Pat tion par ogeneous mit pr ocessing	ralleli allelis s and otoco g, Het	sm, Inter q sm, Design l Heterog lls, cond terogeneou	uery Parallelism, In of Parallel Systems eneous databases, currency control s Distributed Datab	ntra query Paral s. Distributed d in Distributed pases.	lelism, Intra lata storage, l databases,			
Advanced Data types an Databases, Multimedia D	ad New A Databases	Applica s, Mobil	t ions: ity an	Motivation Motivation	n, Time in databas Databases.	es, Spatial and	Geographic			
Advanced Transaction p memory databases, Rea Management in Multi dat	al time tabases.	e g: Tran transac	nsacti ction	on process systems,	ing Monitors ,Tran Long Duration	sactional Work Transactions,	flows, Main Transaction			
Text Books : 1. Henry F. Korth& Abraham Silberschatz [2006], Database System Concepts.										
Deference Deeles										
Keterence Books : 1. RamezElmasri ,Navathe [2009], Fundamentals of Database systems.										
Question Paper Pattern InternalAssessment: Thas to answer any Four	: he quest question	ion pap is for 10	er for mark	internal e	xamination shall c	onsist of Six q	uestions and			

NATURAL LANGUAGE PROCESSING(NLP)

Elective-I for M.Tech	CSE					Scheme	: 2017				
Course Code Hours/Week Credits Maximum Marks											
CS809	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL				
	3	-	-	3	40	60	100				
Sessional Exam Du	ration : 2	Hrs			End Exa	m Duration: 3	Hrs				
Course Outcomes : A	At the end	of the o	course	e the studen	t will be able to						
CO1: Understand varia	ous phases	in natu	ral lar	nguage proc	cessing						
CO2: Understand diffe	rent lingui	stic res	ource:	s software	tools. I						
CO4: Illustrate natural	language	gramma	ar and	context fre	e grammar.						
CO5: Understand appli	ications of	NLP a	nd ma	chine trans	lation.						
<i>Introduction</i> : Human languages, models, ambiguity, processing paradigms; Phases in natural language processing, applications. Text representation in computers, encoding schemes.											
Linguistics resources: WordNet, VerbNet etc. of GATE, NLTK. Regular expressions, Fi models, Finite State Tra	Introducti Resource inite State ansducer.N	ion to c manage Automa V-grams	orpus, ement ata, w s, smo	, elements i with XMI ord recogn othing, ent	in balanced corpus 2, Management of ition, lexicon.Mor ropy, HMM, ME,	, TreeBank, Prp linguistic data w phology, acquisi SVM, CRF.	Bank, rith the help tion				
Part of Speech tagging Handling of unknown w A survey on natural la agreement, tense, aspec Parsing-Unification, pro-	y : Stochas words, nan anguage g et and moo obabilistic	tic POS ned enti ramma d and a parsing	taggi ties, r i rs , le green g, Tree	ng, HMM, nulti word xeme, phor nent, Conte eBank.	Transformation be expressions. nemes, phrases and xt Free Grammar,	ased tagging (TH l idioms, word o spoken languag	3L), rder, e syntax.				
Semantics-Meaning re Word Sense Disambig approaches. Discourse resolution,text coherence	presentati guation-Se e-Referenc ce, discour	<i>on</i> : sen lectiona e resol	nantion I rest ution ture.	c analysis, l triction, m , constrain Application	exical semantics, achine learning a ats on co-referen as of NLP-Spell-ch	WordNet pproaches, dicti ce, algorithm ecking, Summan	onary based for pronoun rization				
Vector space model, ter queries,Machine Transl	rm weighti lation–Ove	ing, hor erview	nonyr	ny, polyser	ny, synonymy, im	proving user					
Text Books : 1.DanielJurafsky and Ja Education, 2009	ames H Ma	artin. Sj	peech	and Langu	age Processing, 26	e, Pearson					
Reference Books :											
1.James A.Natural lang	uage Unde	erstandi	ng 2e	,Pearson E	ducation, 1994						
2.Bharati A., Sangal R. 3.Siddiqui T., Tiwary U	, Chaitany J. S.Natura	a VNa al langu	itural age p	language p rocessing a	rocessing: a Panin nd Information ret	ian perspective, rieval , OUP,20	PHI, 2000 08				

Question Paper Pattern:

InternalAssessment: The question paper for internal examination shall consist of **Six** questions and has to answer any **Four** questions for 10 marks each

EndExam: The question paper for end examination shall consist of **Eight** questions and has to answer any **Five** questions for 12 marks each

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SOFT COMPUTING (SC)

Elective-II for M.Tech.	Scheme	: 2017								
Course Code	Hours	/Week		Credits Maximum Marks						
CS810	L	T	Р	C	Continuous Internal Assessment	End Exam	TOTAL			
	3	U	-	3	40	00	100			
Sessional Exam	Duratio	on:2H	rs		End Exa	m Duration: 3	Hrs			
Course Outcomes : At	t the end	of the c	course	e the studer	t will be able to					
CO1: State the artificial	neural ne	etwork a	archite	ecture.						
CO2: Design perceptron	network	with ba	ack pr	opagation	technique, auto ass	ociative networ	k,			
bidirectional assoc	iative ne	twork, l	Kohoi	nen Self-O	rganizing Feature N	Iap, Learning V	vector			
Quantization and Counter Propagation Network.										
CO3: Explain the fuzzy logic, fuzzy relation, fuzzy arithmetic and fuzzy measures.										
CO4: Understand fuzzy rule base system and approximate reasoning system.										
CO5: Explain encoding, selection, crossover and mutation technique in genetic algorithm.										
Artificial Neural Networ	Artificial Neural Networks:									
Introduction, Basic mode	Introduction, Basic models of ANN, important terminologies of ANNs.									
Supervised Learning Networks: Perceptron Networks, Adaptive Linear Neuron, Back propagation										
Network.										
Associative Memory I	Network	s: Trai	ning	Algorithm	ns for pattern ass	sociation Auto	associative			
Memory, Bidirectional A	ssociativ	ve Mem	ory (I	BAM), and	Hopfield Network	s.				
Unsupervised Learning	Network									
Introduction, Fixed Weig	sht Com	petitive	Nets,	Maxnet, N	fexican Hat Net ,Ha	amming Netwo	rk, Kohonen			
Self-Organizing Feature	e Maps,	Learn	ing	Vector Qu	antization, Counte	er Propagation	Networks,			
Adaptive Resonance The	ory Netv	vorks								
Introduction to Fuzzy Le	ogic, Cla	ssical S	ets a	nd Fuzzy S	ets:					
Introduction, Classical	Sets (Ci	risp Set	ts), F	uzzy Sets,	, Classical Relatio	ons - and Fuzzy	/ Relations-			
Cardinality, Operations, I	Propertie	es and co	ompo	sition. Tole	erance and equivale	nce relations.	tion			
Niembersnip functionsf	eatures,	FUZZIIIC	• Eug	, membersi	hip value assignmention prince	its, Defuzzifica	tion.			
Fuzzy Artuinieuc allu F		easures	: ruz		tic, Extension princ	ipie, ruzzy mea	isules.			
Introduction Truth Vo	luos on	d toble	oning on in	Euzzy k	aio Euzzy Prop	osition Forma	tion Pulse			
Decomposition of Rules	Fuzzy R	u taule	og and	Tuzzy In i Fuzzy Inf	erence Systems		tion Rules,			
Genetic Algorithm.	Tuzzyr	casonn	ig and	i i uzzy iii	crence 5 ystems.					
Introduction Basic Term	ninologie	es in Ge	netic	Algorithm	Operators in Ger	etic Algorithm	-Encoding			
selection Crossover and	Mutatio	n Appli	catio	ns			Lifeounig,			
	101ututio	ii, i i ppii	cution							
Text Books :										
1 S N Siyanandam, S N I	Deena "F	Priciples	of So	oft Comput	ing" WILEY Secon	nd Edition 2013				
2 S.R. Jang, C.T.Sun a	2 S.R. Jang, C.T. Sun and F. Mizutani, "Neuro-Fuzzy and Soft Computing" PHI/Pearson Education									
New Delhi 2004.		zatain,	1,004		ind bolt computin	5 11111 041501	L'advation,			
3.S. Rajasekaran& G.A.	Viiavala	kshmiP	ai. PH	II. New De	lhi 2003					
	<u>, i ju ju i u u</u>		,							
Reference Books :										
1.T. J. Ross "Fuzzy Log	ic with F	Engineer	ing A	pplication	5." TMH. New Yor	k. 1997.				
2.TimothyJ Ross "Fuzzy	Logic v	vith Eng	rineer	ing Applic	ations". McGraw-F	Till. 1997				
3.Davis E.Goldberg, "Ge	netic Al	gorithm	s: Se	arch. Ontin	nization and Machin	ne				
	,			, - r						

Question Paper Pattern:

InternalAssessment: The question paper for internal examination shall consist of **Six** questions and has to answer any **Four** questions for 10 marks each

HIGH PERFORMANCE COMPUTING (HPC)

Elective-II for M.Tech. CSE				Scheme	: 2017					
Course Code	Hours	Week		Credits	Maximum Marks	S				
					Continuous					
CS911	L	Т	Р	С	Internal	End Exam	TOTAL			
C3011					Assessment					
	3	0	-	3	40	60	100			
Sessional Exam	Duratio	n :2 H	rs		End Exa	m Duration: 3	Hrs			
Course Outcomes : At	$\frac{t \text{ the end}}{1}$	of the c	ourse	the studer	nt will be able to					
CO1: Understand the des	signing c	of parall	el alg	orithms.	11 . 1					
CO2: Summarize the bas	sic comn	lunicati	on op	erations of	parallel programs.					
CO4: Understand the programming using message passing paradigm										
CO5: Understand the programming shared address space platforms.										
Condenstand the programming shared address space platonins.										
Introduction and Parall	el algori	thm des	ign:							
Implicit parallelism, Mer	nory sys	tem per	form	ance, Preli	minaries, decompo	sition techniqu	es, tasks and			
interactions, load balanci	ng, meth	ods for	reduc	ing interac	ction overheads, par	allel algorithm	models.			
Basic communication operations:										
Meaning of all-to-all, all-	reduce,	scatter,	gathe	r, circular	shift and splitting ro	outing message	s in parts.			
Analytical modeling of p	oarallel p	rogram	s:	1 66 4	C 1	C	1.1.11.			
Sources of overhead, pe	erforman	ce meti	rics, t	he effect	of granularity on j	performance, s	scalability of			
of parallel programs	ini exect		le, III		si optimai executio	ii time, asympt	one analysis			
Programming using me	sage na	ssing na	radio	m.						
Principles. Building blo	ocks. M	PI. To	ologi	ies and e	mbedding. Overla	pping commu	nication and			
computation.		7 -	0		6,					
Programming shared ad	dress sp	ace plat	forms	5:						
Thread basics, POSIX	threads	, Three	ads c	reation a	nd termination, S	ynchronization	primitives,			
Controlling thread and	synchro	nizatior	attri	butes, thr	ead cancellation, (Composite syn	chronization			
constructs.										
The AD set of										
1 AnonthGrome A	nchul Gu	nto Go	orgo I	Zorupia V	inin Kumar · Introd	uction to Daral	101			
1. Analuloralia, A	nd Editic	ipia, Ge	orge i	$\frac{1}{2}$	non Kumar . muou		lei			
Computing, Seco		JII I Care		ideation, 2	007.					
Reference Books :										
1. Benedict R Gast	er, Lee	Howes, McGray	Davi	d R Kael	liPerhaad Mistry D	ana Schaa, He	eterogeneous			
2. Jason Sanders	Edward	Kandro	$\frac{1}{1}$ of Cl	I DA Bv	Example – An In	troJason Sand	ers. Edward			
Kandrot, CUDA Wesley, 2011.	By Exam	ple –A	n Intro	oduction to	GeneralPurpose G	PU Programm	ing, Addison			
Question Paper Pattern	:	•		•	• • • • • •					
InternalAssessment: T	he quest	ion pap	er for	internal e	examination shall c	onsist of Six q	uestions and			

InternalAssessment: The question paper for internal examination shall consist of **Six** questions and has to answer any **Four** questions for 10 marks each

IMAGE AND VIDEO PROCESSING (IVP)

Elective-II for M.Tech.	CSE					Scheme	: 2017			
Course Code	Hours	/Week		Credits	Max	imum Marks				
					Continuous					
CS812	L	Т	Р	С	Internal	End Exam	TOTAL			
					Assessment	(0)	100			
	3	-	-	3	40		100			
Sessional Exam Dura	tion:2	Hrs			End Exa	m Duration: 3	Hrs			
Course Outcomes : At	the end	of the c	ource	the studen	t will be able to					
CO1: Understand the bas	ics of im	age and	vide	nrocessir	a techniques					
CO2: Identify methods for	r enhand	cing ima	ge an	d video pr	ocessing					
CO3: Analyse image and	video m	odels.	ige un	a viaco pr						
CO4: Understand techniques of image and video compression.										
CO5: Explain storing, retrieving and authenticating image and video.										
	0			0 0						
Introduction:										
Introduction to digital im	age and	video pi	ocess	sing, Basic	image processing to	echniques.				
Image and Video Proces	sing:	Ł		U,		1				
Linear and non-linear fil	ltering, '	Wavelet	denc	oising for i	mage enhancement	t, basic method	ls for image			
restoration and identificat	ration and identification.									
Image and Video Analys	is:									
Image representation and image models – Computational models, Multiscale image decomposition and										
wavelets, random field m	nodels, i	mage m	odula	tion mode	s, image noise mod	dels. Statistical	methods for			
image segmentation, vide	eo segme	entation.	Algo	orithms for	image processing.					
Image and video compre	ssion:									
Lossless coding, block	truncat	ion coc	ling,	fundamen	tals of vector qu	antization, way	velet image			
compression, JPEG lossy	and loss	sless im	age co	ompression	standards, multisp	ectral image coo	ding.			
Basic concepts of vid	leo cod	ing and	1 H.2	261 stand	ard, spatiotempora	al subband/wa	velet video			
compression, object-base	d video	coding,	MPE	G video sta	indards.					
Image and video storage	, retrievo	al and c	omm	unication:						
Image and video indexin	g and re	etrieval,	A un	ified frame	ework for video bro	owsing and retri	ieval, image			
and video communication	n networ	ks, imag	ge wa	termarking	for copyright prote	ection and authe	entication.			
1 Alon C Dovik [2 nd]	7dition]	II an dh a	h of L	mass and V	idaa Duaaagina Aaa	damia Draga 200)5			
1. Alan C Bovik, $[2]$ f	zanionj,	Hanaboo	ок ој п	mage ana v	ideo Processing, Aca	idemic Press, 200				
Reference Books :										
1. Todd R. Reed, [20	04], Dig	ital Ima	ge Se	quence Pro	cessing, Compress	ion and Analysi	is, CRC Press			
Ouestion Paper Pattern	:									
InternalAssessment: The question paper for internal examination shall consist of Six questions and										
has to answer any Four	question	10^{10} s for 10	mark	s each						
	1									
EndExam: The question	n paper f	for end a	exami	nation sha	ll consist of Eight a	questions and h	as to answer			
any Five questions for 1	2 marks	each				1				

MOBILE AD-HOC NETWORKS (MANETS)

Flective-II for M Tech CSF Scheme • 2017											
Course Code	Hours	Week		Credits	Scheme : 2017						
Course coue	nours	··· ccix		creatio	Continuous						
	L	Т	Р	С	Internal	End Exam	TOTAL				
CS813	-	-	-	Ũ	Assessment						
	3	_	-	3	40	60	100				
Sessional Exam Dura	tion : 2	Hrs		-	End Exa	n Duration: 3	Hrs				
				I							
Course Outcomes : At the end of the course the student will be able to											
CO1: Understand the basic concepts of ad-hoc networks, Wireless channel characteristics &											
Mobility models.											
CO2: Elaborate goals, de	sign issu	es,class	ificat	ion of MA	C protocols & Cont	ention based					
protocols using var	rious me	chanism	ns, IEl	EE standar	ds:802.11a, 802.11b	o, 802.11g,					
802.15. HIPERLA	N.										
CO3: Differentiate Proac	tive Vs I	Reactive	e routi	ing and typ	bes of network rout	ing algorithms.					
CO4: Explain Transport	layer, ad-	-hoc trai	nspor	t protocols	& security issues in	ad-hoc networ	KS.				
CO5: Understand the cor	cepts of	cross la	yer d	esign,optin	nization techniques	& Integration of	of				
Adhoc networks for	or 4G .		-		_	-					
Introduction:											
Introduction to ad-hoc ne	etworks -	- definit	ion, c	haracterist	ics features, applica	tions.					
Characteristics of Wirele	ss chann	el, Ad-l	noc M	lobility Mo	dels:- Indoor and o	utdoor models.					
Medium Access Protoco	ls:										
MAC Protocols: design i	ssues, go	als and	class	ification. C	Contention based pro	otocols- with					
reservation, scheduling a	lgorithm	s, proto	cols u	ising direct	ional antennas. IEE	E standards:					
802.11a, 802.11b, 802.11	g, 802.1	5. HIPE	ERLA	N							
Network Protocols:											
Routing Protocols: Desi	gn issue	es, goal	s and	l classifica	tion. Proactive Vs	reactive routi	ng, Unicast				
routing algorithms, Mu	ticast ro	outing a	lgorit	thms, hybr	algorith	nm, Energy aw	are routing				
algorithm, Hierarchical F	couting,	QoS aw	are ro	outing.							
Ena-Ena Delivery & Sec	in design	na Tra	nanoi	rt lavar ala	adhaation adhaat	rongnort protog	ola Soourity				
issues in adhee networks	in design	ing- 11a	longo	s network	socurity attacks so	cure routing protoc	ois.security				
Cross Lawar Design & L	. issues a	n Of A	Internet	$\frac{5, \text{ Hetwork}}{f_{\text{or}} AC}$	security attacks, se	cute touting pro	100018.				
Cross Luyer Design & II	ed for a	ross lay	unoc j	oros	e laver optimizatio	n norometer (ntimization				
techniques Cross laver c	autionar	v nresne	octive	Intergratio	on of adhoc with M	obile IP networ	ks				
teeninques, cross layer e	autional	y prespe		. intergratio			кз.				
Text Books •											
1 C Siva Ram Murthy ar	nd B S M	Ianoi A	d hoc	Wireless	Networks Architect	ures and					
protocols 2nd edition	Pearson	Educati	$on_2($) 007		ures und					
2 Charles E Perkins Ad	hoc Net	workin	o Ad	dison – We	eslev 2000						
	1100110	ew orking	5, 114		, 2000						
Reference Books :											
1. Stefano Basagni, Marc	o Conti.	Silvia (Fiord	ano and Iva	an stoimenovic. Mo	bile ad hoc					
networking, Wiley-IEI	EE press.	2004.									
2. Mohammad Ilvas, The	handbo	ok of ad	hoc w	vireless net	works, CRC press.	2002.					
3. T. Camp, J. Boleng. ar	nd V. Da	vies "A	Surve	ey of Mobi	lity Models for Ad	Hoc Network					
4. Research," Wireless C	ommun.	and Mo	bile (Comp., Spe	cial Issue on Mobi	le Ad Hoc					
Networking Research	Trends	and Anr	licati	ons vol 2	no 5 2002 pp 48	3-502					

Networking Research, Trends and Applications, vol. 2, no. 5, 2002, pp. 483–502.
5. A survey of integrating IP mobility protocols and Mobile Ad hoc networks, Fekri M.Abduljalil and Shrikant K. Bodhe, IEEE communication Survey and tutorials, v no.1 2007

6. V.T. Raisinhani and S.Iyer "Cross layer design optimization in wireless protocol

stacks"Comp. communication, vol 27 no. 8, 2004.

- 7. V.T.Raisinhani and S.Iyer,"ÉCLAIR; An Efficient Cross-Layer Architecture for wireless protocolstacks", World Wireless cong., San francisco, CA, May 2004.
- 8. V.Kawadia and P.P.Kumar,"A cautionary perspective on Cross-Layer design,"IEEE Wireless commn., vol 12, no 1,2005

Question Paper Pattern:

InternalAssessment: The question paper for internal examination shall consist of **Six** questions and has to answer any **Four** questions for 10 marks each

ADVANCED COMPUTER ARCHITECTURE (ACA)

Flective-II for M Tech_CSFScheme • 2017										
Course Code	Hours	Week		Credits	lits Maximum Marks					
					Continuous	DUS				
CS914	L	Т	Р	С	Internal	End Exam	TOTAL			
C3014					Assessment					
	3	-	-	3	40	60	100			
Sessional Exam Dura	tion : 2	Hrs			End Exa	n Duration: 3	Hrs			
	.1 1	6.1		.1 . 1						
Course Outcomes : Af	the end	of the c	ourse	the studen	t will be able to		1			
Program flow mechanisms										
CO2: Identify tradeoffs h	namsms	Comple	v Inct	ruction Se	t Computers (CISC) Reduced				
Instruction Set Cor	nnuters ((RISC)	Scala	r and Vect	or processor), Reduced				
CO3: Explain Hierarchic	al bus sy	(stem ar	nd Ba	ckplane bu	s specification					
CO4: Understand Cache	memory	organiz	zation	Shared m	emory organization	and concepts i	n			
Hierarchical mem	ory tech	nology.	Junion	, onarea m	ongunization	i una concepto i				
CO5: Classify Pipeline P	rocessor	s based	on Pi	cocessing le	evels, Configuration	ns and Control				
Strategies.				U	, U					
CO6: Understand Multip	rocessor	System	Inter	connects,	Cache Coherence,	Synchronization	1			
Mechanisms and M	Message	Passing	Mec	hanisms.						
Parallel Computer Mode	els:									
The State of Computing,	Multipro	ocessors	and	Multi com	puters, Multi vector	and SIMD com	iputers,			
Conditions of Parallelism	n, Progra	m Partit	ionin	g and Sche	duling- Grain Sizes	s and Latency, C	brain			
Packing and Scheduling,	Program	I HOW N	lecha	nisms.						
System Interconnect Arc	nitectur Douting	e: Statia (onno	otion Natur	orka Dunamia Con	nation Nature	·lzo			
Advanced Processor Tech	hpology	Static C	color	and Vector	Processor Super s	calar Processo	KS,			
Architecture Buses And	Arbitrati	on- Hie	rarch	ical Bus Sy	stem Backplane B	us Specification	.5, V LI W			
Memory Hierarchy	monnan		1 al CII	icai Dus D	stem, Backplane B	us opeenteation	1.			
Hierarchical Memory Te	chnology	/ Inclus	ion. (Coherence	and Locality. Mem	ory Capacity Pla	anning			
Cache Memory Organiza	tion. Ca	che Add	lressir	ng Models.	Shared Memory O	rganizations- In	terleaved			
Memory Organization, B	andwidtl	h and fa	ult To	olerance, M	femory Allocation S	Schemes.				
Pipelining And Supersco	ılar Tech	hniques	:	,	5					
Linear Pipeline Processor	rs, Nonli	near Pip	beline	Processors	s, Instruction Pipeli	ne Design, Arit	hmetic			
Pipeline Design-Compute	er Arithn	netic Pr	incipl	es, Static A	Arithmetic Pipeline,	Multifunctiona	.1			
Arithmetic Pipeline.										
Multiprocessors And Mu	ılti-Com	puters:								
Multiprocessor System In	nterconne	ects, Ca	che C	oherence a	nd Synchronization	n Mechanisms, I	Message			
Passing Mechanisms- Me	essage R	outing S	Schem	nes, Deadlo	ock and Virtual Cha	nnels, Flow Co	ntrol			
Strategy.										
Text Books :		7		1. 1	De	114 Dave	-1-11:4			
1.Kai Hwang (2000), Ad The McCreHill	vancea C	ompute	er Arc	initecture-	Parallelism, Scalab	llity, Programm	ability,			
Reference Books :										
1.David E. Culler. J. P. S	ingh. An	lood Gii	pta. F	Harcourt As	siam, Morgan Kauf	mann (1999). P	arallel			
Computer Architecture. I	Elsevier.	India.	r, r		,	(), - (
L	- ,									

2.V. Rajararnan, C. Siva Ram Murthy (2000), Parallel Computers - Architecture and Programming, Prentice Hall of India, New Delhi.

Question Paper Pattern:

InternalAssessment: The question paper for internal examination shall consist of **Six** questions and has to answer any **Four** questions for 10 marks each

TECHNICAL ENGLISH (TE)

I Semester	: Common for Programme	· All M. s	Гесh				Scl	heme: 2017				
Course Code	Category	Ho	Hours/Week Credits Maximum Marks									
AU101	Foundation	L	Т	P C Continuous Internal Assessment End Exam								
		1	1]								
Sessional Exam Duration: - End Exam Duration: -												
Course Outcomes: At the end of the course students will be able to												
CO 1: Write Technical Reports, Journal Papers and Project Reports.												
CO 2: Write Job Applications, Resumes and Statements of Purpose.												
Course Content												
1 Technical Deports Formats and Styles												
1. Technical Reports – Formats and Styles												
b) Factu	al Report											
c) Projec	at Reports											
2. Journal H	Papers- Format	s										
3. Paper Pr	esentation Stra	tegies										
4. Statemer	nt of Purpose for	or Interns	hips and	Appren	ticeships							
5. Letter W	riting- Job App	olications	s, Resum	e Prepa	ration							
6. Commor	n Errors in Rese	earch Pap	pers	-								
Reference	Books:		~		~							
1. Sangeeta PHI Lear	Sharma &Bin Sharma Private L	od Mishi imited.	a, Comn	nunicati	on Skills f	or Engineers a	nd Scienti	ists,				
2. M. Ashraf Rizvi, Effective Technical Communication, Tata McGraw-Hill Publishing												
Company	y Ltd., 2005.											
3. Thomas	S. Kane, TheC	Oxford Es	ssential C	Buide to	Writing, C	DUP, 2010						
4. Joan van	Emden, A Gu	ide to Te	chnical R	Report V	Vriting							
http://scisw	eb.ulster.ac.uk	/~project	s/guide-t	o-techn	ical-writin	<u>g-1.pdf</u>						

SOFTWARE LAB-1

M.Tech CSE-I Semester				Scheme : 2017						
Course Code	Hours/	Week		Credits	Max	imum Marks				
CS804	L	Т	Р	С	Continuous Internal Assessment	End Exam TOTAL				
	0	0	3	2	50	50	100			
Sessional Exam	Duratio	n : 3 H	rs		End Exa	m Duration: 3	Hrs			
	A ()1	1	6.4		. 1	1 /				
Course Outcom	es: At th	he end (of the	course the	students will be ab	le to				
CO2: Implement operation	ns on nne ons on bi	ar uata nary se	arch t	rees						
CO3: Develop programs	s for all p	airs sho	ortest	path and tra	avelling sales perso	on's problems				
using dynamic pro	grammin	g.		1		1				
CO4: Develop a program	n for solv	ing 8-Q	ueen'	s problem	using back tracking	g technique.				
			Li	st of experi	ments					
Advanced Data Stru	ctures an	d Algo	rithm	s (ADSA)						
1. a) Implementation	of Mergi	ing of t	wo so	rted arrays.						
b) Implementation	of Polyn	omial r	nanip	ulation usin	ng Linked Lists.					
2. a) Implementation	of Oper	ations of	on Sta	ck using Li	nked Lists.					
b) Implementation	1 of Oper	Express	on Cir	cular Queu	e using Arrays.					
4 Implementation of	f Operati	expres	Sioii E Rinar	v Search Ti	rees					
5. Implementation of	f Heap So	ons on	Dina	y Searen 11						
6. Implementation of	f binary	search	techni	que using o	divide and conquer	method.				
7. Implementation of	f all pairs	s shorte	st patl	h using dyn	amic programming	<u>.</u>				
8. Implementation of 8-Queens problem using backtracking.										
9. Implementation of	f travellii	ng sales	perso	n problem	using dynamic pro	gramming.				
InternalAssessment: 50)									
EndExam: 50										

SOFTWARE LAB-2

M.Tech CSE-I Semeste	er					Scheme	: 2017			
Course Code	Hours	Week		Credits	Max	ximum Marks				
CS805	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL			
	0	0	3	2	50	50	100			
Sessional Exan	n Duratio	on : 3 H	rs		End Exa	m Duration: 3	Hrs			
Course Outcomes : At the end of the course the students will be able toCO1: Develop TCL scripts to simulate TCP/IP based wired networks communications.CO2: Develop AWK scripts to analyse the network performance using Xgraph tool.CO3: Develop TCL scripts to simulate wireless networks.CO4: Analyze the performance of AODV, DSR and DSDV routing protocols.List of experiments										
 Advanced Computer 1. Simulating TCP a 2. Simulate the beha a) Node Failure a 3. Simulate multicas 4. Analyze the networe 5. Studying TCP core 6. Simulate a simple 7. Simulate a MANH 8. Simulate a) Hiddee Also use RTS and 9. Analyze the starva 10. Compare the perfect 	r Network nd UDP o viour of and b) I ting routi ork perfor ngestion v wireless ET with 2 en node pr d CTS has ation and formance	commun Link Fai ng appr mance vindow networl nodes v roblem ndshake fairness of AOI	Simu nicatio ilure v oach. using size t k with which and b e sche s of IE DV, D	<i>lation Prog</i> on between with both S awk and x hrough Xg 5 nodes. are movin Exposed f me to solve EEE 802.11 SR and DS	grams) two computers. tatic and Dynamic graph tools. raph. g towards each oth node problem in W e these problems. J MAC. DV routing protoc	Routing. er. /LAN. ustify your answ	ver.			
InternalAssessment: 5 EndExam: 50	0									

ARTIFICIAL INTELLIGENCE (AI)

II Semester :CSE						Scheme	: 2017			
Course Code	Hours	Week		Credits	Max	imum Marks				
					Continuous					
CS815	L	Т	Р	С	Internal	End Exam	TOTAL			
					Assessment	<i>(</i> 0)	100			
	3	-	-	3	40	<u>60</u>	100			
Sessional Exam Dura	tion : 2	Hrs			End Exal	n Duration: 3	Hrs			
Course Outcomes • At	the end	of the c	ourse	the studer	t will be able to					
CO1: Understand the bas	sic princi	iples, ar	plicat	tions of Ar	tificial Intelligence.					
CO2: Formalize a given	problem	in the l	angua	ge/framew	ork of AI methods	(search problem	n, as a			
constraint satisfact	ion prob	lem).	U	C		` I	,			
CO3: Represent Knowledge using Predicate logic and rules.										
CO4: Describe how to implement strategies, procedures for game playing.										
What is Artificial Intellig	gence?		<i>.</i> .	XX71 (·		0 771 1 1	6 41 11			
The AI problems, the u	hloma	g Assu	mptio	on, what 1	s an AI Iechnique	e? The level of	t the model,			
search production syste	ms Pro	blem ch	i spac paract	eristics pr	oduction system of	e problem as a	sues in the			
design of search program	III3, 110 IS.		ander	ensues, pi	oddetion system e	naracteristics, i	issues in the			
Heuristic Search Techni	ques:									
Generate and test, Hill climbing, Best first search, problem reduction, constraint satisfaction, Mean										
ends analysis.										
Knowledge Representation	on:									
Representations and m	appings,	approa	aches	to know	ledge representation	on, Issues in	Knowledge			
Representation, The Fran	ne Proble	em.								
Representing simple fact	s in logi	c. Repre	esenti	ng Instanc	e and Isa relationsh	ins. Computab	le Functions			
and Predicates, Resoluti	on. Rep	resentir	ng Kr	nowledge	Using Rules - Pro	cedural versus	declarative			
knowledge, logic program	nming, f	orward	versu	s backward	l reasoning, matchi	ng.				
Weak Slot And Filler Str	ructures	•								
Semantic nets, Frames.	Strong	Slot An	d Fil	ler Structu	ires - Conceptual	dependency, sc	cripts, CYC.			
Game Playing - MIN MA	X searc	h procee	dure,	Adding Al	pha Beta cutoffs.					
Toyt Doolse										
1 Flaine Richie Ke	vin Knie	t [200	81 [2	nd Edition	Artificial Intellige	nce TMH				
	v III I X III z	5m [200	0], [2	Luition	, migiciai mienige					
Reference Books :										
1. Stuart Russell, P	eter No	rvig [20)08],	[2 nd Edition	on], Artificial Intel	ligence A Mod	lern			
Approach, Pearso	n Educa	tion.			-	-				
2. Nils J. Nilsson: P	rinciples	of Arti	ficial	Intelligenc	e – Narosa Publicat	tion house.				
3. Artificial Intellige	ence, Wi	nston, P	atrick	k, Henry, P	earson Education.					
<u> </u>										
Question Paper Pattern	:									
InternalAssessment: T	he quest	ion pap	er for	internal e	xamination shall co	onsist of Six qu	uestions and			
has to answer any Four	question	s for 10	mark	ks each		1				

CLOUD COMPUTING (CC)

II Semester :CSE						Scheme	: 2017		
Course Code	Hours/	Week		Credits	Max	imum Marks			
					Continuous				
	L	Т	Р	С	Internal	End Exam	TOTAL		
CS816					Assessment				
	2	0		2	40	60	100		
~	3	0	-	5	40	00	100		
Sessional Exam	Duratio	$\mathbf{n}: 2 \mathbf{H}$	rs		End Exa	m Duration: 3	Hrs		
Course Outcomes : At	t the end	of the c	ourse	the studen	it will be able to				
CO1: State the roots, dep	oloyment	models	s and	features of	cloud computing.				
CO2: Summarize the usa	ige and c	haracter	ristics	s of virtuali	zation in a cloud co	omputing enviro	onment.		
CO3: Inustrate thread, ta	ISK and n	in creat	ice pr	ogramming	g models using Alle	Ka. Coogla App En	aina		
CO4: Explain the steps in	he Web	n clean	tura a	nd ECG us	alesiorce.com and	Google App Ell	gine.		
CO3. Onderstand Orep t			iure a		sing Amazon ciouu	•			
Introduction to Cloud C	omnutin	o:							
Roots of Cloud Compu	iting. La	s. vers ar	nd Ty	vpes of C	louds. features of	a Cloud. Cha	llenges and		
Risks,Cloud Infrastructu	reManag	ement,	Infra	structure a	s a Service Provid	lers, Platform a	as a Service		
Providers, Challenges an	dOpporti	unities.				,			
Virtualization:									
Introduction, Characteris	tics of V	/irtualiz	ed E	nvironmen	ts, Virtualization a	nd Cloud Com	puting, Pros		
and Cons of Virtualizati	on, Tecl	nnology	Exa	mples,VM	Migration Service	s, VM Provisio	oning in the		
Cloud Context, Future R	lesearch	Directio	ons.						
Programming Enterprise	e Clouds	using ${}_{\!$	Aneka	<i>a</i> :					
Introduction to Aneka	Architect	ure, Tł	nread	Programm	ning using Aneka,	Task Program	ming using		
Aneka, Map Reduce Prog	grammin	g using	Anek	a.					
Developing Cloud Applie	cations:								
Salesforce.com: Create a	an accou	nt, crea	te an	object, m	ake the app and te	est it, Google A	App Engine:		
Create and uploading the	e app, R	egistrati	on, V	Vindows N	Aicrosoft Azure: Ci	reation of an ap	op, Running		
the app locally.									
Cloud Applications and	usage:	1 1	~ 7						
Integration of private and	l public c	clouds, (Jrep I	the Web on	Amazon cloud, EC	G, Hosting Ma	issively		
Wumprayer Games on C		sting Iv	vittei	and Faced	ook oli Cloud.				
Toyt Books .									
1 "Cloud Computi	ing: A	Practic	al A	nnroach"	by Toby Velte	Anthony Ve	lte Robert		
Elsenpeter.McGra	aw-Hill.	Inc. Nev	w Yoi	rk. NY. US	SA.	7 minony VC			
2. RaikumarBuvva.	Christia	n Vecc	hiola.	S.Thama	raiSelvi. "Masterin	g Cloud Com	puting", 1st		
Edition, McGraw	Hill Pub	lication	IS.	,		.8 ere <i>n</i> a een	p		
Reference Books :									
1 RaiKumarRuvva Jame	s Brober	o "Clo	ıd Co	mnuting P	rinciples and Parad	ioms" John Wi	lev & Sons		
Publications.		5, 0100		mpunis I	incipies and i arau		10°		
2.Judith Hurwitz, R Bloo	r, M Kar	nfman, l	F Hal	per, "Cloud	l Computing for Du	ummies", 1st Ed	lition,		
Wiley Publishers, 2009).		-						

Question Paper Pattern:

InternalAssessment: The question paper for internal examination shall consist of **Six** questions and has to answer any **Four** questions for 10 marks each.

DATA SCIENCE (DS)

II Semester :CSE						Scheme	: 2017
Course Code	Hours	Week		Credits	Μ	aximum Marks	
					Continuous		
	T.	т	р	C	Internal	End Exam	TOTAL
CS817	L	1	1	Č	internar		TOTAL
					Assessment		
	3	0	-	3	40	60	100
Sessional Exar	m Duratio	n : 2 H	rs		End Ex	xam Duration: 3	Hrs
Course Outcomes :	Δt the end	of the c	ourse	the studer	t will be able to		
CO1: Illustrate 6 Phase	es Of Data	Analyt	ics Lit	fe Cycle.			
CO2: Make an initial a	nalvsis of	the data	$\frac{100}{100}$ using	g R.			
CO3: Determine The N	Number of	Cluster	s for a	a Given Us	e Case Using K-	Means	
Clustering algori	thm.				-		
CO4: Identify The Free	quent Item	Sets Fo	or A C	Given Data	Using Apriori A	lgorithm.	
CO5: Describe Linear	And Logis	tic Reg	ressio	n Models.			
CO6: Classify The Giv	en Data U	sing De	ecision	n Tree And	Naive Bayes Cl	assifier.	
CO7: Demonstrate Tin	ne Series A	Analysis	Usin	g ARIMA	Model.		
CO8: Describe the Cha	allenges an	d Tools	s for A	Analyzing	lext and other U	nstructured Data.	
Examples of Big Data Model Planning, Mo Innovation Network a Introduction to R, Expl Advanced Analytical Th Clustering: Overview, Algorithm, Evaluation Transactions in a Grocer Advanced Analytical Th Linear Regression, Log Models. Classification Classification Methods.	Analytics del Build and Analy oratory Da eory and I K-means, of Cand y Store, V heory and gistic Reg : Decisio	s. Data ling, C sis (GI ata Anal Method Addit idate I alidatio Method ression, on Tree	Anal common NA). lysis, s ional Rules, n and Is: Re Reases, N	ytics Lifec unicate R Review of Statistical I Algorithm Applicat Testing, D gression: sons to C laive Bay	ycle: Overview, esults, Operation of Basic Data Methods for Evan is. Association ions of Association iagnostics. Thoose and Cau es, Diagnostics	Discovery, Data malize, Case St Analytic Method luation. Rules: Overvie iation Rules, A tions, Additional of Classifiers,	Preparation, audy: Global ds Using R: w, A priori n Example: Regression Additional
Overview of Time Series Steps, A Text Analysis Document Frequency (T Insights. Advanced Analytics-Tec Analytics for Unstructur Database Text Analysis.	s Analysis Example FFIDF), C hnology a red Data,	, ARIN , Collec ategoriz <i>nd Too</i> The Ha	IA Mo cting i zing I <i>ls: Mo</i> doop	ap Reduce Ecosystem	tional Methods. Representing T by Topics, Det and Hadoop h. In-Database A	Text Analysis: T Text, Term Frequermining Sentime Analytics: SQL Est	ext Analysis ency-Inverse ents, Gaining ssentials, In-
Text Books :							
1 Data Science & Big							
Education Services ,V	Data Anal Viley Publ	ytics Di ishers.	scove	ering, Anal	yzing, Visualizin	g and Presenting	Data EMC
Education Services ,W	Data Anal Viley Publ	ytics Di ishers.	scove	ring, Anal	yzing, Visualizin	g and Presenting	Data EMC

2012.

2. Jiawei Han and Micheline Kamber, "Data Mining: Concepts and Techniques", Morgan Kaufmann Publishers, 3rd ed, 2010.

3. Thomas A. Runkler , "Data Analytics: Models and Algorithms for Intelligent Data Analysis", Springer Science & Business Media, 2012.

Question Paper Pattern:

InternalAssessment: The question paper for internal examination shall consist of **Six** questions and has to answer any **Four** questions for 10 marks each.

MACHINE AND DEEP LEARNING (MDL)

Elective-III for M.Tech. CSE					Scheme	: 2017				
Course Code	Hours/	Week		Credits	Max	imum Marks				
					Continuous					
	L	Т	Р	С	Internal	End Exam	TOTAL			
CS820					Assessment					
					Assessment	<u></u>	100			
	3	0	-	3	40	60	100			
Sessional Exam	Duratio	n : 2 H	rs		End Exa	m Duration: 3	Hrs			
Course Outcomes : At	t the end	of the c	course	the studen	ts will be able to					
CO1: understand the bas	ic neural	networ	k arcl	hitecture ar	nd algorithms.					
CO2: understand supervi	ised and	unsuper	rvised	l learning p	rocess.					
CO3: understand the pro	cess of b	uilding	a mae	chine learn	ing algorithm.					
CO4: describe the archite	ecture, pa	aramete	rs and	a multi-tas	king in deep learni	ng.				
Introduction of Noural N	Votworks	· •								
What is a neural networ	k? Hum	an Brai	n Ma	odels of a	Neuron Neural ne	tworks viewed	as Directed			
Graphs, Feedback, Net	work Ar	chitectu	ires.	Knowledge	e Representation,	Artificial Intel	ligence and			
Neural Networks.			,	U	1 ,		0			
Learning Process:										
Error Correction learning, Memory based learning, Hebbian learning, Competitive, Boltzmann										
learning, Credit Assignr	nent Pro	blem,	Super	vised and	Unsupervised Lea	rning, Memory	y, Adaption,			
Statistical nature of the le	earning p	rocess.								
Machine Learning Basic	cs:	0	•			- 4 - un				
Estimators Bias and Va	apacity,	Overnu Maxim	ing a	ikelihood	Estimation Baye	eters and valid	supervised			
Learning Algorithms I	Insuperv	ised Le	arnin	o Algorithi	ms Stochastic Gr	adient Descent	Building a			
Machine Learning Algor	ithm . Ch	nallenge	es Mo	tivating De	ep Learning	adient Descent	, Dunung u			
Deep Feedforward Netw	orks:									
Example: Learning XOI	R , Grad	lient-Ba	sed I	earning,	Hidden Units, A	rchitecture Des	ign , Back-			
Propagation and Other D	ifferentia	ation Al	gorith	nms						
Regularization for Deep	p Learni	ng:								
Parameter Norm Penaltie	es, Norr	n Penal	ties a	s Constrain	ned Optimization,	Regularization	and Under-			
Constrained Problems, I	Dataset A	Augmen	itation	1 Noise R	obustness, Semi-S	upervised Lear	ning, Multi-			
Pagging and Other Engl	Stopping	,Paran	Dro	Tying and	Parameter Sharin	g, Sparse rep	Tangant			
Prop and Manifold Tang	ent Class	sifier	, DI0	pour ,Auv	ersariai fraining,	Tangent Dista	lice, Tangent			
		SILICI								
Text Books :										
1.SimonHaykin,[2 nd editi Education.	ion], [200)5] Neu	ral ne	etworks A c	comprehensive four	dations, Pearso	on			
2.Deep Learning by Ian England [2016]	Goodfe	llow ,Y	oshu	aBengio ,A	Aaron Courville, T	The MIT Press	Cambridge,			
Reference Books :										
1.Neural networks in Con	mputer ir	ntelliger	nce, L	i Min Fu T	MH [2003]					
2 Machine Learning by T	Com M M	fitchell	McG	Fraw Hill F	ducation [2013]					

3.Neural networks James A Freeman David M.Skapura Pearson education [2004]

4. Deep Learning with Tensorflow by Giancarlo Zaccone, Md. Rezaul Karim, Ahmed Menshawy, Packt Publishing Limited [2017]

Question Paper Pattern:

InternalAssessment: The question paper for internal examination shall consist of **Six** questions and has to answer any **Four** questions for 10 marks each.

SOFTWARE QUALITY AND TESTING (SQT)

Elective-III for M.Tech	n. CSE			Scheme : 2017					
Course Code	Hours	Week		Credits	Max	imum Marks			
					Continuous				
	L	Т	Р	С	Internal	End Exam	TOTAL		
CS821					Assessment				
	3	0	-	3	40	60	100		
Sessional Exam	Duratio	n : 2 H	rs		End Exa	m Duration: 3	Hrs		
Course Outcomes : A	t the end	of the c	course	the studer	nt will be able to				
CO1: Understand the im	portance	of soft	ware of	quality/soft	tware testing and ap	oply software te	sting		
CO2: Concrete test asso	ormation	system	s deve	elopment.	ng various tast pro	agging for cont	nuous		
quality improvement.									
CO3: Apply software tes	sting tech	miques	in coi	nmercial e	nvironments and as	sess the adequa	ocy of test		
suites using contro	ol flow, d	ata flow	, and	program n	nutation.	soos me aaeque			
CO4: Identify the graph	and trans	saction	flows	implemen	tation use of variou	is testing techni	ques.		
CO5: Understand the im	portance	and lin	nitatic	ons of doma	ain testing. Differe	ntiate ugly and	nice		
domains.									
Software Quality:	T (1 O	1.		,					
What is Software quality	, Total Q	uality n	nanag	gement.	process quality m	atrias matrias	for coftwore		
quality maintenance Exa	amples	uct qua	ility I	neures, m	-process quality in	ieures, meures	IOI SOITWATE		
Software Testing:	inpico.								
Introduction, Purpose of	testing,	Some D	oichot	omies, Mo	del for testing, Cor	sequences of b	ugs,		
Taxonomy for bugs.	U.				C	•			
Flow Graphs and Path	Testing:								
Path testing basics, Path	Predicate	es and A	Achiev	able paths	, Path Sensitizing, 1	Path Instrument	ation.		
Fuzzy Rule Base and Ap	proxima	te Reas	soning	g Transact	ion Flow Testing:				
Flows, Transaction Flow	Testing	Technic Leasting	ques						
Constin Algorithm Dom	sics and	resting	Strate	egies.					
Domains and paths Dom	uin Tesu vain Test	ing. Do	mains	and Interf	ace Testing Doma	ins and Testabil	ity		
Domains and paths, Dom	ium rest	ing, Do	mame		dee Testing, Donia		ity.		
Text Books :									
1. Stephen H. Kan	[2008], A	<i>Metrics</i>	and N	Iodels in S	oftware Quality En	<i>gineering</i> , Pear	son		
Education	6T		1	D	unter als Dana a				
2. Boris Beizer, So	Itware I	esing I	echnic	ques, Dreai	mtech Press				
Question Denon Dettorn									
Internal Assessment. T	he quest	ion non	er for	internal a	vamination shall a	onciet of Siv or	uestions and		
has to answer any Four	question	is for 10) mark	ts each			destions and		
EndExam: The questio any Five questions for 1	n paper f <u>2 ma</u> rks	for end of each	exami	nation sha	ll consist of Eight of	questions and h	as to answer		

COMPUTER VISION (CV)

Elective-III for M.Tech	M.Tech. CSE					Scheme	: 2017			
Course Code	Hours/	Week		Credits	Max	imum Marks				
					Continuous					
C\$822	L	Т	Р	С	Internal	End Exam	TOTAL			
C3022					Assessment					
	3	-	-	3	40	60	100			
Sessional Exam Dura	tion : 2	Hrs			End Exa	m Duration: 3	Hrs			
Course Outcomes : At	t the end	of the c	ourse	the studer	nt will be able to					
CO1: Classify Image rep	resentati	ons.								
CO2: Apply Image transformation methods.										
CO3:Implement image p	rocessin	g algori	thms.							
CO4:Design face detecti	on and re	ecogniti	on alg	gorithms.						
Image model and acquis	ition:									
The image model and acc	quisition	, image	shape	e, sampling	, intensity images,	color images, ra	inge			
images, image capture, so	canners.									
Statistical and spatial op	erations	:								
Statistical and spatial o	perations	s, Gray	leve	l transform	nations, histogram	equalization,	multi image			
operations. Spatially de	ependent	transfo	ormat	ions, temp	plates and convolu-	ution, window	operations,			
directional smoothing, other smoothing techniques.										
Segmentation, Edge det	ection a	nd Mor _l	pholo	gical oper	ations:					
Segmentation and Edge	detectio	n, regio	on op	erations, I	Basic edge detection	on, second orde	er detection,			
crack edge detection, ed	ge follov	ving, gr	adien	t operators	, compass & Lapla	ce operators.M	orphological			
and other area operation	ons, basi	c morp	holog	gical opera	ations, opening an	d closing open	rations, area			
operations, morphologica	al transfo	rmation	IS.							
Image compression:										
Image compression: Typ	pes and	require	ments	s, statistica	al compression, sp	atial compressi	on, contour			
coding, quantizing comp	ression.									
Representation and Dese	cription:	01.1	•	·.·		. D' ' 1 W				
Representation and Desc	ription,	Jbject I	Recog	gnition, 3-1	J vision and Geom	etry, Digital Wa	atermarking.			
Texture Analysis.										
Text Books :	0					: 2000				
1.D. A. Forsyth, J. Ponce	,Сотри	ter Visi	on: A	Modern A	<i>pproach</i> , PHI Lear	ning 2009.				
Reference Books :		1.D	D	1 D		1.0	T 71 1			
1.Milan Soanka, Vaclav I	Havac at $\frac{1}{4}$	nd Roge	er Boy	yle, <i>Digital</i>	Image Processing	and Computer	Vision-			
Cengage Learning, 201	4	D: :/ 1	т			. 2007				
2.R.C. Gonzalez and R.E	. Woods,	Digital	Imag	ge Processi	ng, Pearson Educat	10n, 2007				
Question Paper Pattern	l : 1		<u> </u>	• , 1	• ,• 1 11					
internalAssessment: T	ne quest	ion pap	er for	internal e	examination shall c	onsist of Six q	uestions and			
has to answer any FOUR	question	5 101 10	mark	as each						
EndExam: The question	n paper f	or end	exami	nation sha	ll consist of Eight of	questions and h	as to answer			

any Five questions for 12 marks each

INTERNET OF THINGS (IoT)

Elective-III for M.Tech	. CSE					Scheme	: 2017	
Course Code	Hours	Week		Credits	Max	imum Marks		
					Continuous			
	L	Т	Р	С	Internal	End Exam	TOTAL	
CS823					Assessment			
					Assessment	<u></u>	100	
Sectional Even	3 Duratio		-	3	40 End Ever	60 m Durations 3	100	
Sessional Exam	Duratio	П:2П	rs			II Duration: 5	nrs	
Course Outcomes : A	t the end	of the c	ourse	the studer	t will be able to			
CO1: Describe the IoT I	Design M	ethodol	ogy.					
CO2: Understand the de	sign of a	portable	e IoT	using Ard	uino/ Raspberry Pi.			
CO3: Understand the de	ploymen	t of an I	oT ap	plication a	nd connect to the c	loud.		
CO4: Describe the appli	cations o	f IoT.		•				
Introduction to IoT:								
Definition & Characteris	stics of Io	oT-Phys	ical d	lesign - Lo	gical design – IoT	Enabling Techr	nologies-IoT	
Levels and Deployment	Template	es -IoT v	vs M2	2M.				
IoT Design Methodology:								
IoT systems management - Simple Network Management Protocol (SNMP)- Network Operator								
Requirement- IoT Design Methodology – Specifications Integration and Application Development.								
Building IoT with Arduino:								
AVR Family with Ardu	ino AT	Mega 3	328-]	Interfaces	- Arduino IDE – I	Programming –	- Interfacing	
LED- Interfacing LED a	nd Switc	h with A	Ardun	10.				
Wireless Technologies f WiFi (IEEE 802.11), Blu	or IoT (I ietooth/B	<i>luetootl</i>	& 2): 1 Sma	art, ZigBee	ZigBeeSmart, UW	/B (IEEE 802.1	5.4).	
Building IoT with Raspl	berry Pi	:						
Basic Building blocks of	of IoT D	evice- 1	Raspb	erry Pi –	About the board -	- Raspberry Pi	Interfaces -	
Programming Raspberry	y Pi wi	th Pyth	on–	Controllin	g LED, Interfacir	ng LED and	Switch with	
Raspberry Pi.								
Case Studies and Advan	ced Topi	cs:	~					
Various Real time appl	ications	of loT-	Con	necting lo	T to cloud $-$ Clou	id Storage for	IoT – Data	
Analytics for IoT – Softw	vare & N	lanagen	nent 'I	l'ools for lo	oT.			
Text Books •								
1. ArshdeepBahga,	Vijay M	ladisetti	, "Int	ternet of T	[•] hings – A hands-	on approach",	Universities	
Press, 2015.	5 5		,			11 /		
2. Manoel Carlos R	amon, "	Intel® (Galile	to and Inte	l® Galileo Gen 2:	API Features a	and Arduino	
3 Marco Schwartz	"Interne	t of Thi	Apre	255, 2014. with the Ard	uino Vun" Packt D	Publishing 201/	1	
5. Marco Schwartz,	Interne		igs w			uonsning, 201-	+.	
Reference Books •								
1 Hazenberg Meta	Products	Buildi	no th	e Internet (of Things Hitgever	iiBis 2011		
2 Greenfield Adam	1 Every	vare: Th	ie dav	vning age o	of ubiquitous comp	uting New Ride	ers 2010	
2. 5100111010, 710011		,	uuv		- aciquitous comp			
Question Paper Pattern	ı:							
InternalAssessment: T	he quest	ion pap	er for	internal e	xamination shall co	onsist of Six q	uestions and	
has to answer any Four	question	is for 10	mark	ks each.		-		

INFORMATION RETRIEVAL SYSTEM (IRS)

Elective-III for M.Tech.	. CSE					Scheme	: 2017		
Course Code	Hours/	Week		Credits	Max	imum Marks			
					Continuous				
	L	Т	Р	С	Internal	End Exam	TOTAL		
CS824					Assessment				
	3	0		3	40	60	100		
Sectional Even Dr		2 IIma	-	5	End Exam Du	notions 2 Ung	100		
Sessional Exam Du	iration :	2 HIS			Ellu Exalli Du	ration: 5 mrs			
Course Outcomes : At the end of the course the student will be able to									
CO1: Understand core co	oncepts,	models	and b	asic algori	thms involved in pr	ocessing and re	etrieval		
of information.	. 1	· · .		<u> </u>					
CO2: Formulate queries	to evalua	ate exist	ing ir	itormation	retrieval systems.	Sustama			
CO4: Understand softwa	re and h	ardware	text	search algo	rithms	ai Systems.			
CO5: Assess the perform	nance of	Informa	tion s	svstems.	41tmis.				
CO6: Understand theorie	es to effe	ctively	solve	informatio	n retrieval problem	s in real world			
Situations.		2			Ĩ				
Introduction:	`	1				7 1 10 T	1		
Basic Concepts, Past, F	Present a	and Fut	ure o	of IRS, Re nd Eiltonin	etrieval Process. N	Nodeling: Intro	oduction, A		
Classic IP Alternative Se	, Reinev	al: Ad-	noc a dole	nu Fillerin Alternative	g, A Formal Char	acterization of	IR Models,		
Retrieval Evaluation.			ueis, 1	Alternative	Algebraic Models.				
Introduction. Retrieval	Perfor	nance	Eval	uation. R	Reference Collecti	ons. Ouerv	languages:		
Introduction, Keyword-ba	ased que	rving, P	attern	n Matching	Structural Oueries	5. Ouery Protoc	ols.		
Document and Term Clu	stering:	<u>, , , , , , , , , , , , , , , , , , , </u>		0					
Introduction, Thesaurus g	generatio	n, Item	clust	ering, Hiei	archy of Clusters-	User Search 7	Fechniques:		
Search Statements and	Binding	, Simila	arity	measures	and ranking, Rele	vance Feedbac	k, Selective		
Dissemination of Infor	mation	Search,	We	ighted Sea	arches of Boolean	n Systems, Se	earching the		
INTERNET and Hyper	text- In	formati	ion V	/isualizati	on: Introduction,	Cognition and	perception,		
Tormation Visualization	n Techno	logies.							
Introduction Software Te	ext Searc	h Algor	rithm	s Hardwar	e Text Search Syste	me			
Information System Eve	aluation	: Introd	luctio	n. Measur	es used in System	Evaluation. N	leasurement		
Example - TREC results.				,	, and the second second	· · · · · · · · · ,			
Multimedia Information	Retrieve	ıl:							
Models and Languages -	– Data N	/lodelin	g, Qu	ery Langu	ages, Indexing and	l Searching - L	ibraries and		
Bibliographical Systems	– Online	R Sys	tems	and Docur	nent databases, Onl	ine Public Acc	ess Catalogs		
(OPACs), Digital Librari	es.								
Text Books •									
1 Modern Information Re	etrieval F	Sv Rica	do B	aeza-Yates	Pearson Education	n. 2007			
2. Information Storage a	nd Retrie	eval Svs	tems	Theory ar	d Implementation	by Kowalski. G	erald J.		
Mark T, Maybury, Kluwe	er Acade	mic Pre	ss, 20)00.	r	- j , -	,		
Reference Books :									
1.Information Retrieval I	Jata Stru	ctures a	nd A	Igorithms I	By William B Frake	es, Ricardo Bae	za-Yates,		
2 Information Storage &	Retievalt	Ry Roha	ort Ko	rfhage _ L	hn Wiley & Sons				
2.momation Storage &	ixeue vall	<i>y</i> 1000							

3. Introduction to Information Retrieval By Christopher D. Manning and PrabhakarRaghavan, Cambridge University Press, 2008.

Question Paper Pattern:

InternalAssessment: The question paper for internal examination shall consist of **Six** questions and has to answer any **Four** questions for 10 marks each.

OOAD AND DESIGN PATTERNS (OOADDP)

Elective-IV for M.Tech. CSE					Scheme : 2017					
Course Code	Hours/	Week		Credits	Max	imum Marks				
					Continuous					
C5925	L	Т	Р	С	Internal	End Exam	TOTAL			
C\$825					Assessment					
	3	0	-	3	40	60	100			
Sessional Exam	Duratio	n : 2 H	rs		End Exa	m Duration: 3	Hrs			
Course Outcomes : At	the end	of the c	ourse	the studer	nt will be able to					
CO1: Understand UML	importan	ce in ba	isic st	ructural m	odeling.					
CO2: Explain advanced	concepts	in mod	eling	static view	v of a system.					
CO3: Describe the Dyna	mic scen	arios us	sing U	ML Behav	vioral Diagrams.					
CO4: Understand the im	portance	of desi	gn pat	tterns in so	lving object oriente	d design proble	ems.			
CO5: Analyze the desig	n pattern	s used i	n Des	signing a D	Ocument Editor.					
Introduction										
Introducing UML, Conce	eptual M	odel of	UML.	. Common	Mechanisms					
Basic Structural Model	ing: Cla	sses, Cl	ass D	iagrams, Iı	nstances and Object	Diagrams.				
Advanced Structural Mo	deling:									
Advanced Classes, Adva	nced Rel	ationsh	ips, Ir	nterfacesTy	pes and Roles, Pac	kages.				
Basic Behavioral Model	ing Diag	rams:								
Interaction Diagrams, Ac	tivity Di	agrams	• ,	a: 1 a		1 701	1			
Advanced Behavioral N	lodeling	: Event	s and	Signals, St	tate Machines, Proc	esses and Threa	ids,			
Design Pattern:	lait Diag	anns.								
Introduction Design Pat	terns in	Smallta	lk M	VC Descr	ihing Design Patter	ms The Catalo	g of Design			
Patterns. Organizing the	Catalos	y. How	Desi	on Patterr	is Solve Design P	roblems. How	to Select a			
Design Pattern, How to U	Jse a Des	sign Pat	tern.	6		,				
A Case Study: Designing	g a Docu	ment E	ditor:	•						
Design Problems, Docur	nent Str	ucture,	Form	atting, Em	bellishing the User	r Interface, and	Supporting			
Multiple Look-and-Feel	Standard	ls, Supp	portin	g Multiple	e Window Systems	, User Operatio	ons Spelling			
Checking and Hyphenatic	on.									
Text Books •										
1 "GradyBooch	Iames R	umbau	oh Iv	ar Iacobso	n The Unified Mod	leling Language	User			
Guide, Pearsor	i Educati	on.	511, 110				0.000			
2. Ali Bahrami –	Irwin [1	999], <i>O</i>	bject	Oriented S	ystems Developmer	nt, McGraw Hil	l.			
3. Erich Gamma Pearson Educa	[2008], <i>I</i> tion.	Design l	Patter	ns element	s of reusable object	t oriented softw	are,			
Question Paper Pattern	• • • • • • • •		f			energiat - f St	1			
has to answer any Four	question	s for 10	er for mark	ts each.	xamination shall c	onsist of Six q	lestions and			

CYBER SECURITY (CS)

Elective-IV for M.Tech.	CSE					Scheme	: 2017	
Course Code	Hours	/Week		Credits	Max	imum Marks		
					Continuous			
C000	L	Т	Р	С	Internal	End Exam	TOTAL	
CS820					Assessment			
	3	-	-	3	40	60	100	
Sessional Exam Dura	tion:2	Hrs			End Exa	m Duration: 3	Hrs	
Course Outcomes : At	the end	of the c	course	the studer	t will be able to			
CO1: Understand Securi	ty Attack	ks, inter	met se	ecurity Ser	vices and standards			
CO2: Analyze traditional	l encrypt	tion algo	orithm	ns and Digi	tal Signature Techr	niques		
CO3:UnderstandNumber Theory and Public Key Encryption Techniques								
CO4:Understand IP, Tran	isport an	d Emai	l Priv	acy Mecha	nisms			
CO5: Analyze Intrusion	Detectio	n, Malio	cious	Software a	nd Firewalls			
Overview of Security Att	acks:							
Security Attacks (In	iterruption	on, Ir	nterce	ption, N	Iodification and	Fabrication)	, Security	
Services(Confidentiality,	Authen	tication	, Inte	grity, Non	-repudiation, acces	s Control and	Availability)	
and Mechanisms, A mod	lel for In	ternetw	ork s	ecurity, Int	ernet Standards an	d RFCs, Buffer	overflow &	
format string vulnerabil	ities, TO	CP sess	ion ł	nijacking,	ARP attacks, rout	e table modifie	cation, UDP	
hijacking, and man-in-the	e-middle	attacks	•					
Conventional Encryption	1 Techn	iques:						
Conventional Encryption	n Princi	ples, C	onver	ntional end	cryption algorithm	s, cipher blocl	k modes of	
operation, location of en	ncryption	n devic	es, ke	ey distribu	tion Approaches o	of Message Au	thentication,	
Secure Hash Functions and	nd HMA							
Number Theory and Pul	olic Key .	Encrypt	tion 1	l'echniques				
Number Theory: Prin	ne and	Relativ	/ely	Prime Nu	mbers, Modular	Arithmetic, Fe	ermat's and	
Euler sineorems, ine Cr	iinese R	emainde	er the	orem, Disc	rete logarithms.	المحسنا المسمع المناط		
digital Cartification C	ryptogra	apny pri	ority	es, public I	key cryptography a	Vorboros V	ansignatures,	
Authentication Service	entineate	: Aum	onty	and key	management	Kelbelos, A.	509Directory	
IP Transport and Email	1 Dringon	••						
IP Security IP Securit	v Overv	'. View ID	Seci	rity Archi	tecture Authentic	ation Header F	ncanculating	
Security Payload Combi	y Overv ning Sec	Δw , Π	socia	ations and I	Cev Management		licapsulating	
Transport Level Secur	itv• We	h Secu	itv R	equiremen	ts Secure Socket	Laver (SSL) a	ndTransport	
Laver Security (TLS) Security	cure Ele	ctronic	Trans	action (SE	T)	Layer (BBL) a	ind Fransport	
Email Privacy: Pretty G	ood Priv	acy (PC	iP) an	nd S/MIMF				
	0001111	uoj (1 c) () (()					
Intrusion Detection, Ma	licious S	Software	e and	Firewalls				
Intrusion Detection: Int	ruders, I	ntrusion	Dete	ection syste	ms, Password Man	agement.		
Malicious Software: Vir	uses and	l related	threa	ts & Coun	termeasures.			
Firewalls: Firewall Desig	gn princi	iples, Tı	rusted	Systems				
Text Books :								
1. Network Security & C	ryptogra	phy: Pri	incipl	es and Prac	ctices, William Stal	lings, PEA, Six	th edition.	
2. Hack Proofing your No	etwork, l	Russell,	Kam	insky, Fore	est Puppy, Wiley D	reamtech		
Reference Books :								
1.Network Security & Cr	yptograp	ohy, Bei	mard	Menezes, (Cengage,2010			
2.William Stallings [200	18], [3 rd	Edition], Nei	twork Secu	erity Essentials (Ap	plications and	Standards),	
Pearson Education								

Question Paper Pattern:

InternalAssessment: The question paper for internal examination shall consist of **Six** questions and has to answer any **Four** questions for 10 marks each

MOBILE APPLICATION DEVELOPMENT(MAD)

Elective-IV for M.Tech	CSE					Scheme	: 2017		
Course Code	Hours	/Week		Credits	Max	imum Marks			
00007	L	Т	Р	С	Continuous Internal	End Exam	TOTAL		
CS827					Assessment				
	3	-	-	3	40	60	100		
Sessional Exam Dura	tion:2	Hrs			End Exa	m Duration: 3	Hrs		
		6.1							
Course Outcomes : At the end of the course the student will be able to									
CO2: Explain android application life cycle, manifest and activities									
CO3: Demonstrate user interface with views, layouts, fragments, adapters and widget tool here									
CO4: Demonstrate the us	age of ir	tents in	tent f	filters and l	Internet resources i	n android appli	cation		
development.		1001105, 11	nem 1			in undrond uppin	cution		
CO5: Explain android ap	plication	n data st	orage	along with	user preferences.				
	•				*				
Getting Started:									
Background, Android: A Android SDK Features	An Oper , Introd	n Platfo ucing t	rm fo he C	or Mobile Open Hand	Development, Na set Alliance, Intr	tive Android A oducing the E	Applications, Development		
Framework.							_		
Getting Started: Develop	ing for A	Android,	Deve	eloping for	Mobile Devices, A	ndroid Develop	ment Tools.		
Creating Applications ar	ıd Activi	ities:							
Android application cor	nponents	s, life c	cycle	of android	l application, crea	ting and using	application		
manifest, Application Pr	iority A	nd Proc	ess S	tates, exter	rnalizing resources	, android appli	cation class,		
Building User Interfaces	.								
Fundamentals of UI desig	on Lavo	uts. Fra	gmen	ts. Widget	Tool Box, Views	Adapters			
Intents. Broadcast Recei	vers and	l Intern	et Res	sources:	10012011, 1000, 1				
Intents, Intent Filters, E	Broadcas	t Recei	vers,	downloadi	ng and parsing Ir	iternet resource	es, usage of		
Files Saving State and I	Proforon	<i>cos</i> •							
Saving application data	and shar	ed prefe	erence	es. retrievir	ng shared preference	ces. Preference	activity and		
framework, Standard pr	eference	activit	y, sa	ving activi	ty state and files.	, Including Sta	tic Files as		
Resources, Working with	n file syst	tem.		C		C			
Text Books :									
1. Professional Android 4	4 Applica	ation De	evelop	pment by R	eto Meier.Third Ec	lition, 2012, Wi	iley		
Publishing, Inc.									
Defenses Desiler									
Reference Books :	: d A				MaCuath MaCu		tion		
1. Dunuing Anuro Second Edition	10 Apps 2015	sineas	y ster	5 by 1011 K	e MicGrath, MicGr	aw-IIII Euuca	ation,		
2 Beginning Androi	$\frac{2013}{10}$	rk Mur	hy F	First edition	(2000) A press Pi	hlichers			
	u Uy 1 v1 a	uk wu	<u>, , , , , , , , , , , , , , , , , , , </u>		(2007), A piess i t	1011511015			
Ouestion Paper Pattern	:								
InternalAssessment: T	he quest	ion pap	er for	internal e	xamination shall c	onsist of Six a	uestions and		
has to answer any Four	question	ns for 10	mark	ks each		1			
EndExam: The question	n paper f	for end o	exami	ination sha	ll consist of Eight	questions and h	as to answer		
any Five questions for 1	2 marks	each							

Free and Open Source Software (FOSS)

Elective-IV for M.Tech.	CSE					Scheme	: 2017	
Course Code	Hours/	/Week		Credits	Max	imum Marks		
CS828	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL	
	3	-	-	3	40	60	100	
Sessional Exam Dura	tion : 2	Hrs			End Exar	m Duration: 3	Hrs	
Course Outcomes : At	the end	of the c	ourse	the studen	t will be able to			
CO1: Understand Python syntax, flow control and looping.								
CO2: Create and run Pyt	hon prog	grams us	sing in	n built data	structures.			
CO3:Understand and imp	plement	functior	ns to p	perform I/C), file and exception	n handling.		
CO4:Understand PHP sy	ntax, flo	w contr	ol and	d looping.				
CO5: Build simple client	t server a	pplicati	ons u	sing PHP.				
Introduction to Python:								
Overview. Environment	setup.	Basic s	yntax	. Variable	types. Operators.	Decision mak	ing. Loops.	
Numbers.								
Built-in data structures in Python:								
Strings. Lists. Tuples. Di	ctionarie	s. Date	& Tir	ne.				
I/O, Files and exception	handlin	g in Pyt	hon:					
Basic I/O functions availa	able in P	ython. (Openi	ng, reading	g, writing and closin	ng files. Creatin	g functions	
and modules. Programs to	o demon	strate ex	ccepti	on handlin	g.			
Introduction to PHP:								
Basics of PHP Scripts. Va	ariables.	Data ty	pes. C	Operators. I	Expressions. Decision	on making. Loo	ops.	
Building applications us	ing PHF	P:						
Arrays. Strings. Date & T	Time. Bu	ilding H	ITML	L forms wit	h PHP.			
Text Books :								
1. Allen Downey, Jeff	rey Elkne	er, Chris	Meye	rs, <i>Learnin</i> g	g with Python.			
2. Steven Holzner, <i>PH</i>	IP: The C	Complete	Refer	ence.				
Reference Books :								
3. John Paul Mueller,	Beginnin	g Progra	.mmin	g with Pyth	on for Dummies.			
4. Julie C Meloni, <i>PHI</i>	P, MySQI	L and Ap	ache,	Pearson Ed	uction, 2012.			
Owertian Denen Detterm								
Question Paper Pattern			an fan	internal a	monetion shall a	anniat of Circ an	restions and	
the student has to answe	r any Fo	ur ques	tions	of 10 mark	ts each.	onsist of Six qu	testions and	
EndExam: The questio has to answer any Five of the second sec	n paper questions	for end s of 12 r	exan narks	nination sh each.	all consist of Eigh	t questions and	the student	
· · · · · · · · · · · · · · · · · · ·								

RESEARCH METHODOLOGY (RM)

II Semester :Common fo	or All M	.Tech				Scheme	: 2017	
Course Code	Hours	/Week		Credits	Max	imum Marks		
					Continuous			
A U102	L	Т	Р	С	Internal	End Exam	TOTAL	
AU102					Assessment			
	1	1	-	0	100	-	100	
Sessional Exam Dura	tion:2	Hrs			End Exa	m Duration: -		
Course Outcomes : A	t the end	of the c	course	e the studer	nt will be able to			
CO1: Understand overvie	ew of res	search p	roces	s, state the	research problem a	nd conduct a lit	erature	
review of the conc	epts con	nprising	the re	esearch que	estions.			
CO2: Study the data coll	ection m	ethods a	and pr	rocess the o	data statistically.			
CO3: Understand the bas	sic prope	rties of	estim	ators, analy	yse the estimated da	ata and interpret	t the data in	
a research paper.								
Maaring Ohiosting and	1		Deer	l				
Turned of Descent Descent	1 MOUVA	ation in	Rese	arcn:	and Walidity and D	aliahility in Dag	aarah	
Features of Good Design	Types	of P ose	s, Kes arch I	Design Bas	ess, validity and K	parimental Desi	ign Stens in	
Sampling Design Chara	, 1 ypes	cof a Gc	and S_{2}	amnle Desi	an Random Samp	les and Random	Sampling	
Design								
Measurement and Scali	ng Teck	minues						
Errors in Measurement.	Tests o	f Sound	l Mea	asurement.	Scaling and Scale	• Construction	Techniques.	
Forecasting Techniques,	Time Se	ries An	alysis	, Interpola	tion and Extrapolati	ion.	, ,	
Methods of Data Collec	tion:		5	/ I	1			
Primary Data, Questionn	aire and	Intervie	ws, C	Collection of	of Secondary Data,	Cases and Sche	dules.	
Statistical Processing:								
Correlation and Regres	ssion A	nalysis,	Met	hod of I	least Squares, Re	gression Vs.	Correlation,	
Correlation Vs. Determin	nation, T	ypes of	Corre	elation and	Their Specific App	lications.		
Hypothesis Testing:								
Tests of Hypothesis, Para	ametric V	Vs. Non	-Para	metric Test	ts, Procedure for Te	esting Hypothes	is, Use of	
Statistical Techniques for	r Testing	g Hypotl	iesis,	Sampling	Distribution, Samp	ling Theory Ch	n-Square	
Test, Analysis of Variand	$\frac{1}{2}$ ce and C	ovarian	$\frac{ce, M}{D}$		e Analysis			
Data interpretation, Layo	out of a F	Kesearch	Pape	er, Techniq	ues of Interpretatio	on.		
Reference Books :		16.1		(1 5 1				
1. C.R. Kothari, <i>R</i> Publishers.	esearch	Method	dolog	y (Method	ls & Techniques)	, New Age I	International	
2. R.Cauvery, V.K.Su	dhaNaya	k, M.Gir	ija, Re	esearch Met	hodology, S.Chand P	ublishers.		
Question Paper Pattern	:		_	<u> </u>				
InternalAssessment: T has to answer any Four	he quest question	tion pap ns for 10	er foi) marl	r internal e ks each	examination shall c	onsist of Six qu	uestions and	
EndExam: The question	n paper i	for end o	exami	ination sha	ll consist of Eight of	questions and h	as to answer	

any **Five** questions for 12 marks each.

SOFTWARE LAB-3

M.Tech CSE-II Semester				Scheme : 2017					
Course Code	Hours/	Week		Credits	Max	ximum Marks			
CS818	L	Т	Р	С	Continuous Internal Assessment	End Exam TOTA			
	0	0	3	2	50	50	100		
Sessional Exa	m Duratio	n : 3 H	rs	End Exam Duration: 3 Hrs					
Course Outcomes : At the end of the course the student will be able to CO1: Understand the concepts of Data mining and Big Data Analytics. CO2: Apply machine learning algorithms for data analytics. CO3: Analyze various text categorization algorithms. CO4: Use Technology and tools to solve the Big Data Analytics problems.									
			List	of experim	ents				
DATA SCIENCE									
1. Preprocessing: Ren standardization and non 2.Association Mining:	noval spe malization Finding As	cified of dat ssociati	attrib a. on Ru	ute, discrii iles using A	mination of a co	ontinuous value r given Transact	ed attribute, tion Dataset.		
3.Classification: classif	y the given	n datase	et reco	ords using E	Decision Tree base	d classification	model.		
4.Classification: class classification model. 5.Clustering: Use k-me	ify the g	given of the state	datase hniqu	et records e to classify	using Multilaye	r Feed forwar	rd Network		
6.Hadoop file managen	nent: Addi	ng files	and c	lirectories,	Retrieving files, I	Deleting files.			
7.Word Count applicat	ion: MapR	educe p	orogra	m to under	stand MapReduce	Paradigm.			
InternalAssessment: EndExam: 50	50								

SOFTWARE LAB-4

M.Tech CSE-II Semest	er					Scheme	: 2017	
Course Code	Hours/Week			Credits	Max	imum Marks		
CS819	L	Т	Р	С	Continuous Internal Assessment	TOTAL		
	0	0	3	2	50	50	100	
Sessional Exam	Duratio	n : 3 H	rs		End Exa	m Duration: 3	Hrs	
Course Outcome	es: At th	ne end o	of the	course the s	students will be ab	le to		
CO1: Develop programs	on flow	control						
CO2: Implement the prog	grams on	list and	d tuple	e data struct	ures.			
CO3: Build programs on	Files.	1:0 ~ 00	ahani					
CO4: Implement Except	ion Hand	ing me		ISIII. st of experi	monts			
Enco and Onor Source	s s S s Here			si oj experti				
Free and Open Sour	ce Sojiw	are (F	J 33)					
1. Implement progra	ms on Fl	ow Cor	ntrol.					
2. Implementation of	f String d	ata stru	icture	•				
3. Implementation of	f List dat	a struct	ure.					
4. Implementation 0	r rupie a	ata stru	cture.					
6 Implement progra	ms on Di	ctionar	ies					
7. Implement progra	ms on Fi	les.	105.					
8. Implement Except	tion Hand	iling M	lechar	nism in pyth	ion.			
		U		1.				
InternalAssessment: 50	0							
EndExam: 50								