NATURAL LANGUAGE PROCESSING			
[As per Choice Based Credit System (CBCS) scheme]			
(Effective from the academic year 2016 -2017)			
	SEMESTER –	VII	
Subject Code	15CS741	IA Marks	20
Number of Lecture Hours/Week	3	Exam Marks	80
Total Number of Lecture Hours	40	Exam Hours	03
	<b>CREDITS</b> –	03	
Course objectives: This course will e	nable students	to	
• Learn the techniques in natural	language proce	ssing.	
• Be familiar with the natural lang	guage generation	on.	
• Be exposed to Text Mining.			
• Understand the information retr	ieval technique	S	
Module – 1			Teaching
			Hours
Overview and language modeling: (	Overview: Orig	ins and challenges of NL	P- 8 Hours
Language and Grammar-Processing	Indian Langu	ages- NLP Applications	;-
Information Retrieval. Language Mod	leling: Various	Grammar- based Langua	ige
Models-Statistical Language Model.			
Module – 2			
Word level and syntactic analysis: V	Word Level An	alysis: Regular Expressio	ons- 8 Hours
Finite-State Automata-Morphologica	l Parsing-Spel	ling Error Detection an	d
correction-Words and Word classes-P	art-of Speech	Tagging. Syntactic Analy	sis:
Context-free Grammar-Constituency-	Parsing-Proba	bilistic Parsing.	
Module – 3			
<b>Extracting Relations from Text:</b>	From Word S	Sequences to Depender	ncy 8 Hours
Paths:			
Introduction, Subsequence Kernels for Relation Extraction, A Dependency-Path			ath
Kernel for Relation Extraction and Experimental Evaluation.			
Mining Diagnostic Text Reports by	Learning to A	nnotate Knowledge Ro	les:
Introduction, Domain Knowledge and Knowledge Roles, Frame Semantics and			nd
Semantic Role Labeling, Learning to Annotate Cases with Knowledge Roles and			and
Evaluations.	- D - J W	h Gaaraha LaFaat Gaarta	
A Case Study in Natural Langua	ge Based we	<b>b Search:</b> Infact Syste	em
Module 4	perfence.		
Module – 4 Evaluating Solf Evaluations in iST	ADT. Word M	Jotahing Latont Soma	otia Q II auna
Evaluating Self-Explanations in IS I Analysis and Tania Models. Intro	AKI: WORU	DT. Eaglbook Systems	nuc 8 Hours
iSTADT: Evaluation of Ecodbook Sys	toma	RT: reedback Systems	,
Toytual Signatures: Identifying Toy	tems,	Latant Samantia Analy	veie
to Moosure the Cohosion of Toxt St	t-1 ypes Using	duction Cohosion Coh	818
Metrix Approaches to Analyzing Tex	ts I atent Sem	antic Analysis Prediction	19
Results of Experiments			,
Automatic Document Separation. A Combination of Probabilistic			
Classification and Finite-State Sequence Modeling. Introduction Related			
Work Data Preparation Document Separation as a Sequence Manning Problem			em.
Results.			
Evolving Explanatory Novel Pattern	ns for Semanti	cally-Based Text Minin	g:
Related Work, A Semantically Guided	d Model for Ef	fective Text Mining.	8

## Module – 5

INFORMATION RETRIEVAL AND LEXICAL RESOURCES: Information<br/>Retrieval: Design features of Information Retrieval Systems-Classical, Non<br/>classical, Alternative Models of Information Retrieval – valuation Lexical<br/>Resources: World Net-Frame Net- Stemmers-POS Tagger- Research Corpora.8 HoursCourse outcomes: The students should be able to:0

- Analyze the natural language text.
- Generate the natural language.
- Do Text mining.
- Apply information retrieval techniques.

### **Question paper pattern:**

The question paper will have ten questions.

There will be 2 questions from each module.

Each question will have questions covering all the topics under a module.

The students will have to answer 5 full questions, selecting one full question from each module.

#### **Text Books:**

- 1. Tanveer Siddiqui, U.S. Tiwary, "Natural Language Pr ocessing and Information Retrieval", Oxford University Press, 2008.
- 2. Anne Kao and Stephen R. Poteet (Eds), "Natural Lang uageProcessing and Text Mining", Springer-Verlag London Limited 2007.

## **Reference Books:**

- 1. Daniel Jurafsky and James H Martin, "Speech and Lan guage Processing: Anintroduction to Natural Language Processing, Computational Linguistics and SpeechRecognition", 2nd Edition, Prentice Hall, 200 8.
- 2. James Allen, "Natural Language Understanding", 2nd edition, Benjamin/Cummingspublishing company, 1995.
- 3. Gerald J. Kowalski and Mark.T. Maybury, "Informatio n Storage and Retrieval systems", Kluwer academic Publishers, 2000.

CLOUD COMPUTING AND ITS APPLICATIONS			
[As per Choice Based Credit System (CBCS) scheme]			
(Effective from	n the academic yea	r 2016 -2017)	
Subject Code	$\frac{15}{15}$	IA Marks	20
Number of Lecture Hours/Week	3	Exam Marks	80
Total Number of Lecture Hours	40	Exam Hours	03
	$\frac{1}{1}$	Exam Hours	05
<b>Course objectives:</b> This course will e	enable students to		
• Explain the fundamentals of cl	oud computing		
• Illustrate the cloud application	programming and	aneka platform	
Contrast different cloud platfor	rms used in industr	y	
Module – 1			Teaching
			Hours
Introduction ,Cloud Computing at a G	lance, The Vision of	of Cloud Computing,	8 Hours
Defining a Cloud, A Closer Look,	Cloud Computing	Reference Model,	
Characteristics and Benefits, Challer	nges Ahead, Histo	rical Developments,	
Distributed Systems, Virtualization,	Web 2.0, Serv	rice-Oriented Compu	ting,
Utility-Oriented Computing, Bui	Ilding Cloud C	computing Environme	ents,
Application Development, Intrastruct	ure and System De	velopment, Compu	iting
AmEnging Migrosoft America Had	azon web Servi	ces (AWS), Go	ogie
Appengine, Microsoft Azure, Hac	loop, rorce.com	and Salesforce.com,	
Virtualization Introduction Charac	teristics of Virtu	alized Environment	e
Taxonomy of Virtualization Techniqu	es Execution Virtu	alization Other Type	s
of Virtualization Virtualization and	Cloud Computing	Pros and Cons of	
Virtualization. Technology Example	s Xen: Paravirtual	ization. VMware: Fu	111
Virtualization, Microsoft Hyper-V			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Module – 2			
Cloud Computing Architecture, Introd	luction, Cloud Refe	rence Model, 8 Hour	S
Architecture, Infrastructure / Hardwar	e as a Service, Plat	form as a Service,	
Software as a Service, Types of Clou	ids, Public Clouds,	Private Clouds, Hyb	orid
Clouds, Community Clouds, Economics of the Cloud, Open Challenges, Cloud			oud
Definition, Cloud Interoperability and	1 Standards Scalabi	lity and Fault Tolerai	nce
Security, Trust, and Privacy Organiza	tional Aspects		a
Aneka: Cloud Application Platform	, Framework Ove	rview, Anatomy of	the .
Aneka Container, From the Ground	i Up: Platform At	ostraction Layer, Fat	oric
Infrastructure Organization Logical	Organization Priv	unding Aneka Clou	us,
Mode Public Cloud Deployment Mod	Organization, FIN	and Cloud Deployin	ud
Programming and Management Anek	a SDK Manageme	epioyment mode, en	Jud
Module – 3			<b> </b>
Concurrent Computing: Thread Programming. Introducing Parallelism for Single 8 Hours			
Machine Computation, Programming Applications with Threads. What is a			
Thread?, Thread APIs, Techniques	for Parallel Com	putation with Threa	ds,
Multithreading with Aneka, Introduci	ng the Thread Prog	ramming Model, And	eka
Thread vs. Common Threads, Progra	amming Applicatio	ns with Aneka Threa	ds,
Aneka Threads Application Model, D	omain Decompositi	ion: Matrix	

Multiplication, Functional Decomposition: Sine, Cosine, and Tangent. High-	
Throughput Computing: Task Programming, Task Computing, Characterizing a	
Task, Computing Categories, Frameworks for Task Computing, Task-based	
Application Models, Embarrassingly Parallel Applications, Parameter Sweep	
Applications, MPI Applications, Workflow Applications with Task	
Dependencies, Aneka Task-Based Programming, Task Programming Model,	
Developing Applications with the Task Model, Developing Parameter Sweep	
Application, Managing Workflows.	
Module – 4	
Data Intensive Computing: Map-Reduce Programming, What is Data-Intensive	8 Hours
Computing?, Characterizing Data-Intensive Computations, Challenges Ahead,	
Historical Perspective, Technologies for Data-Intensive Computing, Storage	
Systems, Programming Platforms, Aneka MapReduce Programming, Introducing	
the MapReduce Programming Model, Example Application	
Module – 5	
Cloud Platforms in Industry, Amazon Web Services, Compute Services, Storage	8 Hours
Services, Communication Services, Additional Services, Google AppEngine,	
Architecture and Core Concepts, Application Life-Cycle, Cost Model,	
Observations, Microsoft Azure, Azure Core Concepts, SQL Azure, Windows	
Azure Platform Appliance.	
Cloud Applications Scientific Applications, Healthcare: ECG Analysis in the	
Cloud, Biology: Protein Structure Prediction, Biology: Gene Expression Data	
Analysis for Cancer Diagnosis, Geoscience: Satellite Image Processing, Business	
and Consumer Applications, CRM and ERP, Productivity, Social Networking,	
Media Applications, Multiplayer Online Gaming.	
Course outcomes: The students should be able to:	
• Explain cloud computing, virtualization and classify services of cloud comp	outing
• Illustrate architecture and programming in cloud	8
<ul> <li>Describe the platforms for development of cloud applications and List the</li> </ul>	application
of cloud	application
of cloud.	
Question paper pattern:	
The question paper will have ten questions.	
There will be 2 questions from each module.	
Each question will have questions covering all the topics under a module.	
The students will have to answer 5 full questions, selecting one full question from	
each module.	
Text Books:	
1. Rajkumar Buyya, Christian Vecchiola, and Thamarai Selvi	Mastering
Cloud. Computing McGraw Hill Education	5
Reference Books:	
1. Dan C. Marinescu, Cloud Computing Theory and Practice, Morgan	Kaufmann,
Elsevier 2013.	

INFORMATION	AND NETWORK	SECURITY [As	
per Choice Based Credit System (CBCS) scheme]			
(Effective from the academic year 2016 -2017)			
S I I I I I I I I I I I I I I I I I I I	EMESTER – VII		20
Subject Code	15CS743	IA Marks	20
Number of Lecture Hours/Week	3	Exam Marks	80
Total Number of Lecture Hours	40	Exam Hours	03
	CREDITS – 03		
<b>Course objectives:</b> This course will e	nable students to		
Analyze the cryptographic proce	esses.		
• Summarize the digital security p	process.		
Indicate the location of a securit	y process in the giv	en system	
Module – 1			Teaching Hours
Introduction, How to Speak Crypto, C	lassic Crypto, Simr	le Substitution Ciphe	r. 8 Hours
Cryptanalysis of a Simple Substit	ution. Definition	of Secure. Do	uble
Transposition Cipher. One-time Pad	. Project VENON	A. Codebook Cipher	
Ciphers of the Election of 1876. M	lodern Crypto His	tory. Taxonomy of	
Cryptography. Taxonomy of Cryptana	lysis.		
Module – 2.			
What is a Hash Function? The Birthda	y Problem.Non-cry	ptographic Hashes.	8 Hours
Tiger Hash. HMAC. Uses of Hash Fur	nctions. Online Bid	s. Spam Reduction.	
Other Crypto-Related Topics. Secret S	haring. Key Escrov	w. Random Numbers.	
Texas Hold 'em Poker. Generating Ran	ndom Bits. Informa	tion Hiding.	
Module – 3			
Random number generation Providin	ng freshness Fund	amentals of er	ntity 8 Hours
authentication Passwords Dynamic password schemes Zero-knowledge			
mechanisms Further reading Crypto	graphic Protocols	Protocol basics From	n
objectives to a protocol Analysing a si	mple protocol Autr	ientication and key	
establishment protocols			
$\frac{\text{Module} - 4}{W}$	(1 11°C (°	V · V	
Key management fundamentals Key le	Constant and lifetimes	S Key generation Key	8 Hours
Management Certification of public	boverning key mar	agement Public-Key	
management models Alternative appro	aches	ate meeyere rubhe-r	Cy
Module _ 5	Jaenes		
Cryptographic Applications Cryptogra	nhy on the Internet	Cryptography for <b>8</b>	Jours
wireless local area networks Cryptography for mobile telecommunications Cryptography for			
secure payment card transactions Cryr	tography for video	broadcasting Cryptos	prography for
identity cards Cryptography for home	users		
<b>Course outcomes:</b> The students shoul	d be able to:		
• Analyze the Digitals security la	anses		
<ul> <li>Illustrate the need of key mana</li> </ul>	gement		
Ouestion paper pattern:	0		
The question paper will have ten questions.			
There will be 2 questions from each module.			
Each question will have questions covering all the topics under a module.			
The students will have to answer 5 full questions, selecting one full question from			
each module.			

# **Text Books:**

- 1. Information Security: Principles and Practice, 2nd Edition by Mark Stamp Wiley
- 2. Everyday Cryptography: Fundamental Principles and Applications Keith M. Martin Oxford Scholarship Online: December 2013

#### **Reference Books:**

1. Applied Cryptography Protocols, Algorithms, and Source Code in C by Bruce Schneier

UNIX SYSTEM PROGRAMMING			
[As per Choice Bas	ed Credit Syste	m (CBCS) scheme]	
(Effective from	the academic y	ear 2016 -2017)	
	<u>SEMESTER – V</u>		
Subject Code	15CS744	IA Marks	20
Number of Lecture Hours/Week	3	Exam Marks	80
Total Number of Lecture Hours	40	Exam Hours	03
	<b>CREDITS – 0</b>	3	
Course objectives: This course will e	nable students t	0	
Explain the fundamental desig	n of the unix op	erating system	
• Familiarize with the systems c	alls provided in	the unix environment	
• Design and build an applicatio	n/service over tl	he unix operating systen	n
Module – 1		1 0 7	Teaching
			Hours
Introduction: UNIX and ANSI Standa	rds: The ANSI	C Standard, The ANSI/I	SO 8 Hours
C++ Standards, Difference between A	NSI C and C++	, The POSIX Standards	,
The POSIX.1 FIPS Standard, The X/C	Open Standards.	UNIX and POSIX APIs	3:
The POSIX APIs, The UNIX and	POSIX Develop	pment Environment, A	.PI
Common Characteristics.			
Module – 2			
UNIX Files and APIs: File Types, The	e UNIX and PO	SIX File System, The	8 Hours
UNIX and POSIX File Attributes,	Inodes in UNI	X System V, Applicat	ion
Program Interface to Files, UNIX Ker	nel Support for	Files, Relationship of C	
Stream Pointers and File Descriptors,	Directory Files,	Hard and Symbolic Lin	ks.
UNIX File APIs: General File APIs, F	ile and Record	Locking, Directory File	
APIs, Device File APIs, FIFO File AP	Pls, Symbolic Li	nk File APIs.	
Module – 3			
UNIX Processes and Process Control: The Environment of a UNIX Process:			8 Hours
Introduction, main function, Process T	ermination, Co	mmand-Line Arguments	5,
Environment List, Memory Layout of	a C Program, S	hared Libraries, Memor	У
Allocation, Environment Variables, setjmp and longjmp Functions, getrlimit,			1.
Setrimit Functions, UNIX Kernel S	upport for Pro	t waitaid wait? wait4	1:
Eunctiona Base Conditional avec Eun	viork, exil, wai	a User IDs and Group	
IDs. Interpreter Files, system Function	Process Accou	g User IDs allu Oloup Inting User Identificati	on
Process Times I/O Redirection Proce	r, 1 Toccss Accor	s. Introduction Termina	JII,
Logins Network Logins Process G	roups Sessions	S. Controlling Termina	1
togetnorn and togetnorn Functions Iol	Control Shell	Execution of Programs	,
Orphaned Process Groups	o control, shen	Execution of Frequency,	
Module – 4			I
Signals and Daemon Processes: Signa	ls: The UNIX K	ernel Support for Signa	ls. 8 Hours
signal, Signal Mask, signation. The SI	GCHLD Signal	and the waitpid Function	n.
The sigsetimp and siglongimp Function	ons. Kill. Alarm	Interval Timers POSD	K.lb
Timers Daemon Processes: Introduction Daemon Characteristics Coding Rules			iles
Error Logging Client-Server Model			
Module _ 5			I
Interprocess Communication · Overvi	ow of IDC Moth	ode Dines nonon natos	
Functions Coprocesses FIFOs Syste	m V IPC. Mess	age Oueues. Semanhore	S. BIIUUIS

Shared Memory, Client-Server Properties, Stream Pipes, Passing File
Descriptors, An Open Server-Version 1, Client-Server Connection Functions.
Course outcomes: The students should be able to:
<ul> <li>Ability to understand and reason out the working of Unix Systems</li> </ul>
• Build an application/service over a Unix system.
Question paper pattern:
The question paper will have ten questions.
There will be 2 questions from each module.
Each question will have questions covering all the topics under a module.
The students will have to answer 5 full questions, selecting one full question from
each module.
Text Books:
1. Unix System Programming Using C++ - Terrence Chan, PHI, 1999.
2. Advanced Programming in the UNIX Environment - W.Richard Stevens, Stephen A.
Rago, 3nd Edition, Pearson Education / PHI, 2005.
Reference Books:
1. Advanced Unix Programming- Marc J. Rochkind, 2nd Edition, Pearson Education,

- Advanced Unix Programming- Marc J. Rochkind, 2nd Edition, Pearson Education, 2005.
   The Device of the Device of the Section Marcine Device of the Device of the
- 2. The Design of the UNIX Operating System Maurice.J.Bach, Pearson Education / PHI, 1987.
- 3. Unix Internals Uresh Vahalia, Pearson Education, 2001.