

Jabalpur Engineering College, Jabalpur

Semester VII Credit Based Grading System (CBGS) w.e.f. July 2018

Scheme of Examination

Bachelor of Engineering B.E. (Computer Science and Engineering)

Subject Wise Distribution of Marks and Corresponding Credits

Scheme of Examination w.e.f. July 2018 Academic Session 2018-19

S.No.	Subject Code	Subject Name & Title	Maximum Marks Allotted					Total Marks	Hours/Week			Total Credits	Total Marks
			Theory			Practical			L	T	P		
			End. Sem.	Mid Sem. MST	Quiz, Assignment	End Sem.	Lab Work						
1	CS7001	Compiler Design	70	20	10	30	20	150	3	1	2	6	
2	CS7002	Data Warehousing and Mining	70	20	10	30	20	150	3	1	2	6	
3	CS7003	Network and Cyber Security	70	20	10	30	20	150	3	1	2	6	
4	CS7004	Elective-III	70	20	10	-	-	100	3	1	-	4	
5	CS7005	Elective-IV	70	20	10	-	-	100	3	1	-	4	
6	CS7006	Project-I	-	-	-	60	40	100	-	-	4	4	
7	CS7007	Industrial Training (Two Weeks)	-	-	-	30	20	50	-	-	2	2	
Total			350	100	50	180	120	800	15	5	12	32	800

MST: Minimum of two mid semester tests to be conducted.

L: Lecture T: Tutorial P: Practical

Department Elective-III (Four Subjects)			Department Elective-IV (Four Subjects)		
S.No.	Subject Code	Subject Name	Subject Code	Subject Name	Subject Name
1	CS7004A	Advance Computing Paradigm	CS7005A	Mobile Computing	
2	CS7004B	Big Data Analysis	CS7005B	Robotics	
3	CS7004C	Real Time System	CS7005C	Internet of Things	
4	CS7004D	Automata and Computability Theory	CS7005D	Human Computer Interaction	

Controller (Exam)
Jabalpur Engineering College
Jabalpur - 482 011 (M.P.)

Registrar (Academic)
for Principal
Jabalpur Engineering College
Jabalpur - 482 011 (M.P.)

DEAN Academic
JEC, Jabalpur (M.P.)

Principal
Jabalpur Engineering College
Jabalpur - 482 011 (M.P.)

Jabalpur Engineering College, Jabalpur
(Credit Based Grading System based scheme)

Bachelor of Engineering (CBGS) Semester: VII (Computer Science & Engg.)

(w.e.f. July 2018)

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		Theory			Practical							
		End Sem	Mid Sem	Quiz, Assignments	End Sem	Lab Work	Assignments/ Quiz/ Term Paper					
CS7001	Compiler Design	70	20	10	30	20	—	150	3	1	2	5

UNIT-I : Introduction: Compilers and Translators; The phases of the compiler – Lexical Analysis, Syntax Analysis, Intermediate Code Generation, Optimization, Code generation, Bookkeeping, Error handling.

UNIT-II : Lexical Analysis: The role of the lexical analyzer, Tokens, Patterns, Lexemes, Input buffering, Specifications of a token, Recognition of a tokens, Finite automata: Regular expressions, NFA, DFA. Design of a lexical analyzer generator.

UNIT-III : Syntax Analysis: The role of a parser, Context free grammars, Writing a grammar, Top down Parsing: Recursive decent parser, Predictive parser, Bottom up Parsing: Handles, Viable prefixes, Operator precedence parsing, LR parsers: SLR, LALR, CLR. Parser generator (YACC). Error Recovery techniques for different parsers.

Syntax directed translation: Syntax directed definitions, Synthesized and inherited attributes, Construction of syntax trees.

UNIT-IV : Run time environments: Source language issues (Activation trees, Control stack, scope of declaration, Binding of names), Storage organization (Subdivision of run-time memory, Activation records), Storage allocation strategies, Symbol tables: storage, data structures used.

UNIT-V : Intermediate code generation: Intermediate languages, Graphical representation, Three-address code, Implementation of three address statements (Quadruples, Triples, Indirect triples).

Code optimization and code generation: Introduction, Basic blocks & flow graphs, DAG, principle sources of optimization: loop optimization, eliminating induction variable, eliminating common sub-expression, loop unrolling, loop jamming etc. Peephole optimization, Issues in the design of code generator, a simple code generator, Register allocation & assignment.

Suggested Books:

1. Dhamdhare : Compiler Construction- Principles and Practice Macmillan, India 198
2. Holub : Compiler Design in C, PHI.

3. Aho Ullman

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CSE SEMESTER VII

Compiler Design:-

Course Outcomes:-

The Students will be able to:-

- CO1 • Implement a lexical analyzer from a specification of a language's lexical rules.
- CO2 • Define software tools used in compiler construction such as lexical analyzer generators, and parser generators.
- CO3 • Illustrate the lexical, syntactic and semantic analysis into meaningful phases for a compiler to undertake language translation.
- CO4 • Develop a large, complex, but well-structured software system that implements various phases of a compiler such as the scanner, parser, code generator, and optimizer.
- CO5 • Identify the similarities and differences among various parsing techniques and grammar transformation techniques.
- CO6 • Formulate the role of the compiler in ensuring the security, privacy and integrity of data.

Y. K. Jain
07/09/18
for HOD CSE

Sachin
07/09/18
(Sachin Dubey)

Jabalpur Engineering College, Jabalpur
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Bachelor of Engineering (CBGS) Semester: VII (Computer Science & Engg.)

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CS7002	Data Ware house and Mining	70	20	10	30	20	—	150	3	1	2	5

UNIT I DATA WAREHOUSING

Data warehousing Components – Building a Data warehouse – Mapping the Data Warehouse to a Multiprocessor Architecture – DBMS Schemas for Decision Support – Data Extraction, Cleanup, and Transformation Tools – Metadata.

UNIT II BUSINESS ANALYSIS

Reporting and Query tools and Applications – Tool Categories – The Need for Applications – Cognos Impromptu – Online Analytical Processing (OLAP) – Need – Multidimensional Data Model – OLAP Guidelines – Multidimensional versus Multirelational OLAP – Categories of Tools – OLAP Tools and the Internet.

UNIT III DATA MINING

Introduction – Data – Types of Data – Data Mining Functionalities – Interestingness of Patterns – Classification of Data Mining Systems – Data Mining Task Primitives – Integration of a Data Mining System with a Data Warehouse – Issues – Data Preprocessing.

UNIT IV ASSOCIATION RULE MINING AND CLASSIFICATION

Mining Frequent Patterns, Associations and Correlations – Mining Methods – Mining Various Kinds of Association Rules – Correlation Analysis – Constraint Based Association Mining – Classification and Prediction – Basic Concepts – Decision Tree Induction – Bayesian Classification – Rule Based Classification – Classification by Backpropagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods – Prediction

UNIT V CLUSTERING AND APPLICATIONS AND TRENDS IN DATA MINING

Cluster Analysis – Types of Data – Categorization of Major Clustering Methods – Kmeans – Partitioning Methods – Hierarchical Methods – Density-Based Methods – Grid Based Methods – Model-Based Clustering Methods – Clustering High Dimensional Data – Constraint – Based Cluster Analysis – Outlier Analysis – Data Mining Applications.

TEXT BOOKS:

1. Alex Berson and Stephen J. Smith, "Data Warehousing, Data Mining & OLAP", Tata McGraw – Hill Edition, Tenth Reprint 2007.
2. Jiawei Han and Micheline Kamber, "Data Mining Concepts and Techniques", Second Edition, Elsevier, 2007.

SUGGESTED BOOKS:

1. Pang-Ning Tan, Michael Steinbach and Vipin Kumar, "Introduction To Data Mining", Person Education, 2007.
2. K.P. Soman, Shyam Diwakar and V. Ajay, "Insight into Data mining Theory and Practice", Easter Economy Edition, Prentice Hall of India, 2006.
3. G. K. Gupta, "Introduction to Data Mining with Case Studies", Easter Economy Edition,

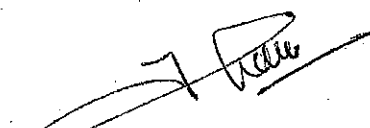
Semester - VII (CSE)

I. DATA WAREHOUSING AND MINING

(CS7002)

Course Outcomes:

CO Nos	Course Outcomes
CO1	Define the scope and necessity of Data Mining & Warehousing.
➤ CO2	Explain the concepts of data warehouse in business analytics.
➤ CO3	Analyze OLAP tools.
➤ CO4	Apply Data mining techniques and methods on large data sets.
➤ CO5	Compare and contrast classification and prediction techniques.
➤ CO 6	Explain data mining tools on various applications and Understand the basics of big data analytics


for HOD CSE


Shalini Ninoriya.

Jabalpur Engineering College, Jabalpur

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(w.e.f. July 2018)

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CS7003	Network and Cyber Security	70	20	10	30	20	—	150	3	1	2	5

UNIT- I: Introduction to Network Security, Confidentiality Integrity and Availability, Basic Principles, Computer Security and Cyber Security, Security Terminologies and Principle, Security Threats, Types of attacks.

UNIT- II : Cryptography, Classical Cryptographic Techniques, Encryption, Decryption, Code Breaking, Methodologies, Cryptanalysis, Cryptography Attacks, Brute-Force Attack, Use of Cryptography. Public key cryptography, Principles of Public key Cryptosystems, Cryptographic Algorithms RSA, Data Encryption Standard (DES), Diffie-Hellman key exchange.

UNIT- III: Hash Functions, One-way Hash Functions, SHA (Secure Hash Algorithm), Authentication Requirements, Authentication Functions, Kerberos, Message Authentication codes, Message Digest Functions, MD5, SSL (Secure Sockets Layer), SSH (Secure Shell), Algorithms and Security, Disk Encryption, Digital Signature, Case Study of PKI in India.

UNIT- IV: Trojans and Backdoors: Types (Remote Access Trojans, Data-Sending Trojans, Destructive Trojans, Trojans, Proxy Trojans, FTP Trojans, Security Software Disablers).

Viruses and Worms: Characteristics, Working, Sniffers: Sniffing Types.

Phishing: Methods, Process, Attacks Types (Man-in-the-Middle Attacks, URL Obfuscation Attacks Deceptive Phishing, Malware-Based Phishing, Content-Injection Phishing, Search Engine Phishing).

Web Application Security- OWASP (Open Web Application Security Project) Standards.

Denial-of Service Attacks: Types of Attacks, DDoS Attack (Distributed DoS Attack.), Session Hijacking, Spoofing v Hijacking, CAPTCHA Protection.

UNIT- V: Firewalls: Types, Operation, Spam filters, Computer Forensics, Need, Objectives, Stages & Steps of Forensic Investigation, Chain of Custody, Hacking, Classes of Hacker (Black hats, grey hats, white hats, suicide hackers), Footprinting, Scanning (Types-Port, Network, Vulnerability).

Suggested Books:

1. William Stallings, "Cryptography and Network Security: Principles and Practice" Pearson
2. Charlie Kaufman, Radia Perlman, Mike Speciner, Michael Speciner, "Network Security - Private communication in a public world" TMH
3. Fourozon, "Cryptography & Network Security" TMH
4. Joseph Migga Kizza, Computer Network Security, , Springer International Edition
5. Atul Kahate, "Cryptography and Network Security" Mc Graw Hill
6. Carl Endorf, Eugene Schultz, Jim Mellander "INTRUSION DETECTION & PREVENTION" TMH
7. Neal, Krawetz, Introduction to Network Security, Cengage

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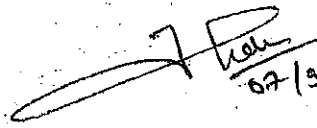
CSE VII

Network & Cyber Security

Course outcomes:

After the successful completion of course, the students will be able to:

- CO1 • Compare between basic principles of computer security and cyber security, cryptology techniques.
- CO2 • Explain cryptographic attacks, Brute Force attack, Difference between symmetric and Asymmetric key cryptography.
- CO3 • Examine and Apply cryptographic algorithm like RSA Algorithm, Diffie Hellman Key Exchange Algorithm.
- CO4 • Distinguish between Hash Functions, Hash Algorithms, Message Digest Functions, Digital Signature etc.
- CO5 • Categorize between Trojans, Backdoors, Worms, viruses. Firewall their functionality, types and implementation.
- CO6 • Illustrate Web security application & also able to contrast on types of attacks (DDoS), Hijacking, Spoofing and captcha protection in web security.


07/01/18
for HOD CSE

Rahul Dongare

Jabalpur Engineering College, Jabalpur
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Bachelor of Engineering (CBGS) Semester: VII (Computer Science & Engg.)

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* CS7004(A)	(Elective-III) Advanced Computing Paradigm	70	20	10	-	-	-	100	3	1	-	4

Unit-I Grid and Cluster Computing

Introduction to Grid Computing , Types of grids ,Grid Activities , e governance , Grid Applications , Grid Computing Organizations and their roles , Grid Architecture ,Grid computing Applications.

Cluster Computing-Definition and Architecture of a cluster ,Cluster Programming Environment and Tools .

Unit-II Quantum Computing

History of molecular electronics , Molecular scale electronic , Quantum mechanic ,Quantum Gates and Circuits , Implementation of Quantum Computer , Quantum Algorithms .

Unit-III Nano Computing

Introduction to Nano Computing, Nano Computing Technology, Nano Information Processing, Physics of Nano Computing, Introduction to Molecular & Optical Computing.

Unit-IV Mobile and Pervasive Computing

Mobile computing , Adaptability , Mobility Management ,Context -Aware Computing and its applications , Introduction to Ad Hoc and Sensor Networks , Approaches to Security .

Unit-V Cloud Computing

Overview of Cloud Computing, Cloud Components , Applications ,Hardware and Infrastructure , Accessing the cloud , Cloud Storage ,Future of Cloud Computing.

SUGGESTED BOOKS:

- 1.Janakiram , Grid Computing ,TMH Pub 2.Prabhu ,
- 2.Grid and Cluster Computing PHI Pub
- 3 Vishal Sahani & Goswami, Nano Computing, TMH Pub
- 4.Bhunla , Introduction to Quantum Computing , New Age Int. Pub
- 5.Adelstein & Gupta , Fundamentals of Mobile and Pervasive Computing , TMH Pub 6.Velte , Cloud Computing , McGraw Hill Pub

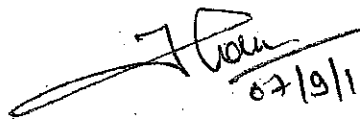
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CSE VII

Advance Computing Paradigm

Course Outcomes

- C01 ▪ Define cloud computing and memorize the different cloud service and deployment model.
- C02 ▪ Design & develop backup strategies for cloud data based on features.
- C03 ▪ Explain the concept of Grid computing and it's applications.
- C04 ▪ Analyze Quantum gate and circuits in Quantum computing.
- C05 ▪ Summarize Nano Computing Technology.
- C06 ▪ Identify the important issues of developing mobile computing systems and applications.


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		End Sem	Mid Sem	Quiz, Assignments	End Sem	Lab Work	Assignments Quiz, Term/Paper					
CS7005(A)	(Elective-IV) Mobile Computing	70	20	10	-	-	-	100	3	1	-	4

Unit - I

Introduction, issues in mobile computing, overview of wireless telephony: cellular concept, GSM: air-interface, channel structure, location management, HLR-VLR, hierarchical, handoffs, channel allocation in cellular systems, CDMA, GPRS 4G

Unit - II

Wireless Networking, Wireless LAN Overview: MAC issues, IEEE 802.11, Blue Tooth, Wireless multiple access protocols, TCP over wireless, Wireless applications, data broadcasting, Mobile IP, WAP: Architecture, protocol stack, application environment, applications.

Unit - III

Data management issues, data replication for mobile computers, adaptive clustering for mobile wireless networks, File system, Disconnected operations.

Unit - IV

Mobile Agents computing, security and fault tolerance, transaction processing in mobile computing environment.

Unit - V

Adhoc networks, localization, MAC issues, Routing protocols, global state routing (GSR), Destination sequenced distance vector routing (DSDV), Dynamic source routing (DSR), Ad Hoc on demand distance vector routing (AODV), Temporary ordered routing algorithm (TORA), QoS in Ad Hoc Networks, applications.

Reference Books:

1. J. Schiller, Mobile Communications, Addison Wesley.
2. Charles Perkins, Mobile IP, Addison Wesley.
3. Charles Perkins, Ad hoc Networks, Addison Wesley.
4. Upadhyaya, "Mobile Computing", Springer

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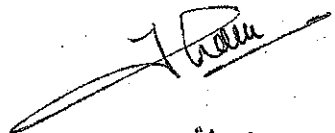
Course Outcomes:-

Mobile Computing:- (CS 7005 A)

Students must be able to:

1. Explain the basic concept of mobile computing.
2. Evaluate TORA, DSDV, AODV, GSR and DSR.
3. Develop Quality of Service (QoS) in Adhoc network.
4. Analyze mobile agent computing.
5. Examine security, fault tolerance and transaction processing in mobile computing.
6. Identify data management issue.
7. Determine adaptive clustering for mobile wireless network.
8. Describe IEEE 802.11, Bluetooth, Mobile IP, Wireless TCP, GSM and GPRS Architecture.
9. Define HLR-VLR, EIR, AUC, MS.
10. Describe location management, mobility management.

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06-09-2018


for HOD CSE

Saurabh Singh

CS 7004	D	Automata and computability Theory	3L:1T: 0P	4 Credits
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Course Contents:

UNIT I:

Automata: Basic machine, FSM, Transition graph, Transition matrix, Deterministic and nondeterministic FSM'S. Equivalence of DFA and NDFA. Mealy & Moore machines, minimization of finite automata, Two-way finite automata. Regular Sets and Regular Grammars: Alphabet, words, Operations, Regular sets, Finite automata and regular expression, Myhill- Nerode theorem Pumping lemma and regular sets, Application of pumping lemma, closure properties of regular sets.

UNIT II:

Context Free Grammars: Introduction to CFG, Regular Grammars, Derivation trees and Ambiguity, Simplification of Context free grammars, Normal Forms (Chomsky Normal Form and Greibach Normal forms).

UNIT III:

Pushdown Automata: Definition of PDA, Deterministic Pushdown Automata, PDA corresponding to given CFG, CFG corresponding to a given PDA. Context Free Languages: The pumping lemma for CFL's, Closure properties of CFL's. Decision problems involving CFL's.

UNIT IV:

Turing Machines: Introduction, TM model, representation and languages acceptability of TM Design of TM, Universal TM & Other modification, Church's hypothesis, composite & iterated TM. Turing machine as enumerators. Properties of recursive & recursively enumerable languages, Universal Turing machine

UNIT V:

Tractable and Untractable Problems: P, NP, NP complete and NP hard problems, examples of these problems like satisfiability problems, vertex cover problem, Hamiltonian path problem, traveling sales-man problem, Partition problem etc.

Suggested Books:-

1. John E. Hopcroft, Jeffery Ullman, "Introduction to Automata theory, Languages & computation", Narosa Publishers.
2. K.L.P Mishra & N.Chandrasekaran, "Theory of Computer Science", PHI Learning
3. Michael Sipsev, "Theory of Computation", Cenage Learning
4. John C Martin, "Introduction to languages and theory of computation", McGraw Hill
5. Daniel I.A. Cohen, "Introduction to Computer Theory", Wiley India.
6. Kohavi, "Switching & Finite Automata Theory", TMH

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AUTOMATA AND COMPUTABILITY THEORY (CS7004D)

- CO1 :** Illustrate conceptual knowledge of switching, finite automata theory, languages and tractable, untractable problems.
- CO2 :** Develop concept of abstract models of computing such as NFA, DFA, PDA, Turing machine and to check their power to recognize the languages.
- CO3 :** Interpret rigorously formal mathematical methods to prove properties and lemma of languages, grammars and automata.
- CO4 :** Classify types of grammars, simplification and normal form and P, NP problems.