Jabalpur Engineering College, Jabalpur

Semester V Credit Based Grading System (CBGS) w.e.f. July 2017

Scheme of Examination

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

Subject wise distribution of marks and corresponding credits

Scheme of Examination w.e.f. July-2017 Academic Session-2017-18

S. No.	Subject Code	Subject Name & Title	Maximum Marks Allotted						Hours / week.			Total Credits	Total Marks
			Theory			Practical		Total Marks					
			End Sem	Mid Sem. MST	Quiz, Assign ment	End Sem.	Lab Work		L	T	P		
1	**CS5001**	Advance Computer Architecture	70	20	10	-	-	100	3	1	-	4	
2	**CS5002**	Computer Networks	70	20	10	30	20	150	3	1	2	6	
3	**CS5003**	Operating System	70	20	10	30	20	150	3	1	2	6	
4	**EC5104**	Microprocessor	70	20	10	30	20	150	3	1	2	6	
5	**CS5005**	Elective-I	70	20	10	-	-	100	3	1	-	4	
6	**CS5006**	Departmental Lab-II (Fundamental of Linux and Shell Programming)	-	-	-	30	20	50	-	-	2	2	
7	**CS5007**	Management Skill Development	-	-	-	-	50	50	-	-	2	2	
8	**CS5008**	Evaluation of Industrial Training (Internal Assessment)	-	-	-	-	50	50	-	-	2	2	
Total			**350**	**100**	**50**	**120**	**180**	**800**	**15**	**5**	**12**	**32**	**800**

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

L: Lecture **T: Tutorial** **P: Practical**

Elective-I	
Subject Code	**Subject Name**
CS5005A	Principal of Programming Languages
CS5005B	Business Communication &Ethics
CS5005C	ERP and Supply Chain Management
CS5005D	Open Source Technologies

B.E.CBGS V SEMESTER
ADVANCE COMPUTER ARCHITECTURE

Course	Subject Title	Subject Code	Grade for End Sem.		CGPA at the end of every even semester
			T	P	
B.E.	Advance Computer Architecture	CS5001	Min. "D"	Min. "D"	5.0

Unit-I:

Flynn's Classification, System Attributes to Performance, Parallel computer models - Multiprocessors and multicomputers, Multivector and SIMD Computers. Data and resource dependences, Hardware and software parallelism, Program partitioning and scheduling, Grain size and latency, Control flow, data flow and Demand driven mechanisms. Static interconnection networks, Dynamic interconnection Networks: Bus Systems, Crossbar Switch, Multiport Memory, Multistage and Combining Networks

Unit- II:

Instruction set architecture, CISC Scalar Processors , RISC Scalar Processors, VLIW architecture, Memory Hierarchy, Inclusion, Coherence and Locality, Memory capacity planning. Interleaved memory organization- memory interleaving, pipelined memory access, Bandwidth and Fault Tolerance. Backplane Bus System :Backplane bus specification, Addressing and timing protocols, Arbitration transaction and interrupt.

Unit-III:

Linear pipeline processor, Nonlinear pipeline processor, Instruction pipeline design, Mechanisms for instruction pipelining, pipeline hazards, Dynamic instruction scheduling - score boarding and Tomosulo's algorithm, Branch handling techniques, Arithmetic Pipeline Design, Static arithmetic pipeline, Multifunctional arithmetic pipelines. Superscaler pipeline design, Super pipeline processor design.

Unit-IV:

Cache coherence, Snoopy protocols, Directory based protocols. Message routing schemes in multicomputer network, deadlock and virtual channel. Vector Processing Principles, Vector instruction types, Vector-access memory schemes. Vector supercomputer architecture, SIMD organization: distributed memory model and shared memory model. Principles of Multithreading: Multithreading Issues and Solutions, Multiple-Context Processors

Unit-V:

Parallel Programming Models, Shared-Variable Model, Message-Passing Model, Data-Parallel Model, Object-Oriented Model, Functional and Logic Models, Parallel Languages and Compilers, Language Features for Parallelism, Parallel Programming Environment, Software Toolsand Environments.

Books Reference:

1. John L Hennessey and David A Patterson, "Computer Architecture A Quantitative Approach", Morgan Kaufmann/ Elsevier, Fifth Edition, 2012..
2. Kai Hwang and Faye Briggs, "Computer Architecture and Parallel Processing", Mc Graw-Hill International Edition, 2000.
3. Sima D, Fountain T and Kacsuk P, "Advanced Computer Architectures: A Design Space

B.E.CBGS V SEMESTER
COMPUTER NETWORKS

Course	Subject Title	Subject Code	Grade for End Sem.		CGPA at the end of every even semester
			T	P	
B.E.	Computer Networks	CS5002	Min. "D"	Min. "D"	5.0

Unit-I:

Importance of computer networks, broadcast and point to point networks, Local area networks and Wide area networks , Introduction to ISO-OSI reference model, TCP/IP reference model , function of each layer, interfaces and services, Protocol data unit, connection oriented and connectionless services, service primitives, comparison of TCP/IP and ISO-OSI reference model, Novel Netware, Arpanet ,X.25

Unit-II:

Data-Link layer: Data link layer design issues, framing , flow & error control , physical addressing, Stop & Wait protocol ,Go back N ARQ ,selective repeat ARQ, piggybacking and pipelining ,HDLC LAN Protocol stack-Logical link control and Media Access Control sub layer, IEEE 802.2 LLC Frame format Data link layer in the internet, Serial line IP and Pont to point protocol

Unit-III:

MAC layer Protocols- , static and dynamic allocation , Pure and slotted ALOH A protocols, Carrier sense multiple access, Persistent and non persistent CSMA, IEEE standard 802.3 and Ethernet,802.3cabling, IEEE 802.4, IEEE 802.5, FDDI Wireless LAN , Comparison of wired and wireless LAN, WIMAX

Unit-IV:

The Network layer- logical addressing, class full & classless addressing , address mapping ,packet delivery & forwarding. unicast routing protocols , multicast routing protocols, Routing algorithm-Least Cost, Dijkstra's, Bellman-ford, congestion control algorithms, Internetworking devices, Introduction to Internet protocol IPv4

Unit-V:

Transport layer-Transport services , Process to process delivery, UDP ,TCP ,congestion control , quality of service , Integrated services, Differentiated services LAN-WAN Design and implementation-Configuring TCP/IP, using IP configure, ping command , study of structured LAN , study of internetworking devices an d their configuration– switches, hubs, Bridges, routers and Gateways

Books Reference:

1. "Local area networks ", Forouzan, TMH, 1st edition
2. "Computer Networks" - Tanenblaum ,PHI Learning.
3. "Computer Networks" ,N Olifer and V Olifer ,Wiley publication
4. "Computer Communications & Networking Technologies"-Michael A. Gallo & William M. Hancock - Cengage pearsen publications.
5. "Computer Networks: Protocols, Standards and Interfaces"- By Black, PHI learning pub

COMPUTER NETWORKS

List of Experiment:

1. Establishment and configuration of LAN
2. Colour coding standard of CAT 5,6,7 and crimping of cable in RJ-45
3. Study of WAN
4. Case study of STOP AND WAIT Protocols
5. Study of sliding window protocol
6. Study of IEEE 802.3, 802.4, 802.5
7. Study of FDDI
8. Study of basic networking commands like ping, ip config, etc
9. Case study of various Routing Strategies
10. Case studies of various Network Topologies
11. Establishing & studying the various parameters of a home LAN Network
12. Study of IOS of routers
13. Configuring routers, bridges and switches and gateways

B.E.CBGS V SEMESTER
OPERATING SYSTEM

Course	Subject Title	Subject Code	Grade for End Sem.		CGPA at the end of every even semester
			T	P	
B.E.	Operating System	CS5003	Min. "D"	Min. "D"	5.0

Unit- I:

Introduction to Operating System: Evolution of Operating System Types of Operating system Batch Processing, Real Time, Multitasking & Multiprogramming, time-sharing system. Operating system services, Operating system structure, System Call & System Boots, Operating system design & Implementations, System protection, Buffering & Spooling.

Unit-II:

Process Management: Basic concepts of CPU scheduling, Scheduling criteria, Scheduling algorithms, algorithm evaluation, multiple processor scheduling. Process concept, operations on processes, threads, inter process communication, precedence graphs, critical section problem, semaphores, classical problems of synchronization. Deadlock problem, deadlock characterization, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock, Methods for deadlock handling.

Unit-III:

Memory Management: Concepts of memory management, logical and physical address space, swapping, Fixed and Dynamic Partitions, Best-Fit, First-Fit and Worst Fit Allocation. Virtual Memory Management- paging, segmentation, and paging combined with segmentation. Cache Memory Organization, demand paging, page replacement algorithms, allocation of frames, thrashing, demand segmentation.

Unit- IV:

File Management: File systems: What is a file, user view of files, file types and file operations, file types in Unix and Microsoft, file operation commands, file access rights, file storage management, Inode or FAT structure, file control blocks, root file system, directory and file paths, blocks, impact of block size selection, contiguous allocation, chained and indexed allocations, Impact of allocation policy on fragmentation, mapping file blocks on the disk platter, cylinder, disk access control and scheduling

Unit- V:

Input Output management & Security: Issues in human centric, device centric and computer centric IO management, input output modes, programmed IO, polling, interrupt mode of IO, various types of interrupts, interrupt servicing, priority interrupts, interrupt vectors, direct memory access (DMA) mode of transfer, setting up DMAs, device drivers, interrupt handling using device drivers, buffer management, device scheduling, disk scheduling algorithms and policies. Role of Operating System in Security, Security Breaches, System Protection, and Password Management

Books Reference :

1. Tanenbaum " Modern Operating System" PHI Lea rning.
2. M. Flynn " Operating Systems". Cengage Learning.
3. Silberschatz ,"Operating system", Willey Pub
4. Dhamdhere, "System Programming and Operating System",TMH.
5. Stuart,"Operating System Principles, Design & Applications", Cengage Learning
6. Operating System : Principle and Design by Pabitra Pal Choudhury, PHI Learning

OPERATING SYSTEM

List of Experiment:

1. Program to implement FCFS CPU scheduling algorithm.
2. Program to implement SJF CPU scheduling algorithm.
3. Program to implement Priority CPU Scheduling algorithm.
4. Program to implement Round Robin CPU scheduling algorithm.
5. Program to implement classical inter process communication problem(producer consumer).
6. Program to implement classical inter process communication problem(Reader Writers).
7. Program to implement classical inter process communication problem(Dining Philosophers).
8. Program to implement FIFO page replacement algorithm.
9. Program to implement LRU page replacement algorithm .
10. Program to implement LFU page replacement.
11. Program to implement Optimal page replacement.

B.E.CBGS V SEMESTER
MICROPROCESSOR

Course	Subject Title	Subject Code	Grade for End Sem.		CGPA at the end of every even semester
			T	P	
B.E.	Microprocessor	EC5104	Min. "D"	Min. "D"	5.0

Unit- I

Salient features of advanced microprocessors. RISC & CISC processors. Review of evolution of advanced microprocessors : 8086 8088 186 / 286 / 386 / 486 / Pentium. Super scalar architecture of Pentium. Architecture of Intel 8086 and assembly language programming with Intel 8086 microprocessors.

Unit- II

Introduction to the various interfacing chips like 8255 and interfacing keyboards, printers, LEDS, motors, ADC, DAC, and stepper motors.

Unit- III

General purpose programmable peripheral devices (8253) 8254 programmable interval timer, 8259A Programmable interrupt controller & 8257 DMA controller.

Unit- IV

Memory Design and Interfacing. Serial I/0: RS 232C standards, USART chip 8251

Unit- V

Introduction to micro controller 8051, Its architecture, pin description, I/o configuration, interrupts, addressing modes, an overview of 8051 instruction set.

Books Reference :

1. B.B. Brey (PHI), "The Intel Microprocessors, Architecture, Programming and Interfacing".
2. A Triebel & Avtar Singh (PHI), "The 8088 & 8086 Microprocessor".
3. D. Hall (Mc-Graw Hill), "Advanced Microprocessor and Interfacing

MICROPROCESSOR

List of Experiment:

1. Signed multiplication of two bytes on dyna-8086 microprocessor kit.
2. Signed multiplication of two data words on dyna-8086 microprocessor kit.
3. To produce a packed BCD byte from two ASCII encoded digits.
4. BCD Multiplication of two numbers and demonstration of AAM instruction.
5. BCD Division of two numbers and demonstration of AAD instruction.
6. BCD Subtraction of two numbers and demonstration of AAS instruction.
7. Conversion of a signed byte to a word.
8. To scan a string of data bytes for a character.
9. To read the temperature of a solution and light one of the three lamps.
10. Conversion from BCD to Hex.

B.E.CBGS V SEMESTER
PRINCIPLE OF PROGRAMMING LANGUAGES

Course	Subject Title	Subject Code	Grade for End Sem.		CGPA at the end of every even semester
			T	P	
B.E.	(Elective – I) Principle of Programming Languages	CS5005A	Min. "D"	Min. "D"	5.0

Unit-I :

Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms – Imperative, Object Oriented, functional Programming , Logic Programming. Programming Language Implementation – Compilation and Virtual Machines, programming environments. Issues in Language Translation: Syntax, Semantics, Stages, analysis and synthesis, Parse Tree, CFG and BNF grammar.

Unit-II:

Data types: Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types. Names ,Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization. Sequence control with Expressions, Conditional Statements, Loops, Exception handling.

Unit -III:

Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic subprograms, design issues for functions overloaded operators, co routines.

Unit -IV:

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, Static and Stack-Based Storage management. heap based storage management. Garbage Collection. object oriented programming in small talk, C++, Java, C#, PHP, Perl. Concurrency: Subprogram level concurrency, semaphores, monitors, massage passing, Java threads, C# threads.

Unit – V:

Exception handling, Exceptions, exception Propagation, Exception handler in C++ and Java. Logic Programming Language : Introduction and overview of logic programming, basic elements of prolog, application of logic programming. Functional Programming Languages: Introduction, fundamentals. Introduction to 4GL.

Books Reference:

1. Louden, "Programming Languages: Principles & Practices" , Cengage Learning
2. Tucker, " Programming Languages: Principles and paradigms ", Tata McGraw –Hill
3. Terrance W Pratt, "Programming Languages: Design and Implementation" Pearson Edu.
4. Cavlo Ghezzi & Mehdi Jazayeri " Programming Languages Concepts", Willey India
5. E Horowitz, "Programming Languages", 2nd Edition, Addison Wesley
6. Sebesta,"Concept of programming Language", Pearson Edu.

B.E.CBGS V SEMESTER
BUSINESS COMMUNICATION &ETHICS

Course	Subject Title	Subject Code	Grade for End Sem.		CGPA at the end of every even semester
			T	P	
B.E.	(Elective – I) BUSINESS COMMUNICATION &ETHICS	CS5005B	Min. "D"	Min. "D"	5.0

Unit-I:Report Writing:

Objectives of report writing, Language and Style in a report ,Types of reports ,Formats of reports: Memo, letter, project and survey based Technical Proposals Objective of technical proposals , Parts of proposal.

Unit-II: Introduction to Interpersonal Skills:

Emotional Intelligence, Leadership, Team Buliding ,Assertiveness ,Conflict Resolution, Negotiation Skills, Motivation ,Time Management.

Unit-III: Meetings and Documentation:

Strategies for conducting effective, Notice, Agenda , Minutes of the meeting.

Unit-IV:

Introduction to Corporate Ethics and etiquettes Business Meeting etiquettes, Interview etiquettes, Professional and work etiquettes, Social skills, Greetings and Art of Conversation ,Dressing and Grooming, Dinning etiquette ,Ethical codes of conduct in business and corporate activities (Personal ethics, conflicting values, choosing a moral response, the process of making ethical decisions).

Unit -V: Employment Skills:

Cover letter, Resume, Group Discussion, Presentation Skills, Interview Skills.

Books Reference :

1. P.S.Rathore,"Business ethics and communication",S.Chand.
2. Dr. D.K. Jain, Anup Dubey ,"Business Management Ethics and Communication",Taxman's
3. Piyanka Mehra," Business Management Ethics and Communication",Taxman's.

B.E.CBGS V SEMESTER
ERP AND SUPPLY CHAIN MANAGEMENT

Course	Subject Title	Subject Code	Grade for End Sem.		CGPA at the end of every even semester
			T	P	
B.E.	(Elective – I) ERP AND SUPPLY CHAIN MANAGEMENT	CS5005C	Min. "D"	Min. "D"	5.0

Unit-I:

Building Blocks, Performance Measures, Decisions, Building Blocks of a Supply Chain Network Performance Measures , Decisions in the Supply Chain World , Models for Supply Chain Decision-Making.

Unit-II:

Supply Chain Inventory Management, Economic Order Quantity Models , Reorder Point Models Multiechelon Inventory Systems.

Unit-III:

Mathematical Foundations of Supply Chain Solutions, Use of Stochastic Models and combinatorial Optimization in: Supply Chain Planning, Supply Chain Facilities Layout, Capacity Planning ,Inventory Optimization, Dynamic Routing and Scheduling ,Understanding the "internals" of industry best practice solutions.

Unit-IV:

Case Studies: Digital Equipment, Case Study : IBM Case Study.

Unit-V:

Internet Techologies and Electronic Commerce in SCM, Relation to ERP , E-procurement , E-Logistics Internet Auctions , E-markets , Electronic business process optimization , Business objects in SCM

Reference Books:

1. David Simchi Levi, "Designing and managing the supply chain", M C Grawhill.
2. Karle-E-Kurbel, "ERP AND SUPPLY CHAIN MANAGEMENT" ,Springer science and Business Media.
3. Prof. Anand Sharma , "Business Optimization Theory SCM" , Himalaya Publishing House.
4. Sunil Chopra, "SCM", Pearson Education.

B.E.CBGS V SEMESTER
OPEN SOURCE TECHNOLOGIES

Course	Subject Title	Subject Code	Grade for End Sem.		CGPA at the end of every even semester
			T	P	
B.E.	(Elective – I) Open Source Technologies	CS5005D	Min. "D"	Min. "D"	5.0

Unit- I: Overview:

Need of Open Sources –Advantages of Open sources –Applications- FOSS – FOSS usage –Free Software Movement – Commercial Aspect of Open Source Movement – Licensing – Certification – Open Source Software Development Model – comparison with close source / Proprietary software – Free Software – Open source vs source –available –Widely used open source software license :Apache License, BSD license, GNU General Public License, GNU Lesser General Public License, MIT License, Eclipse Public License and Mozilla Public License.

Unit- II: Open source OS and system administration task:

Installation of Linux (Redhat/Ubuntu): Theory about Multiboot Environment, Hard disk Partitioning, Swap space, LVM, and Boot loader. Basic File System Management Task, Working with files, Piping and Redirection, Working with VI editor, use, and understanding FHS of Linux.

System Admin Task : Job management, Process Management, Mounting Devices and file system working with Linux, Backup, working with user, group and permission, Managing Software. Understanding Boot process and related files, Common kernel Management Task.

Unit -III: Open source OS security:

Basic networking commands, Configuration of Apache Web servers. Securing servers with IPtables. Introduction to cryptographic services, SSL, Managing Certificate with OpenSSL, working with the GNU Privacy guard.

Unit -IV: Open source OS shell programming:

Bash Shell Scripting, Executing Script, Working with Variables and Input, Using Control Structures, Script control, handling with signals, Creating functions, working sed and awk

Working with web using shell script: Downloading web page as formatted text file and parsing for data, working cURL etc

Unit -V: Open source mobile programming :

Android programming: Introduction to Android Environment (using Eclipse for android development), Activities and Intents, User Interface, Designing UI using views, Data Persistence, Content Providers, messaging and networking, Location-based Services, Publishing Android Applications

Books Reference :

1. Open source Technology: Concepts, Methodologies, Tools and Application by Informations Resources and Management.
2. Open source Technology by Kailash Vadera, Bhavyesh Gandhi. Laxmi Publications Pvt. Ltd.
3. Unix Shell programming- Yashwant Kanetkar. PBP publications.
4. Beginning Android 4 application Development- Wei Meng Lee. Wiley India Publications.

B.E.CBGS V SEMESTER
FUNDAMENTAL OF LINUX & SHELL PROGRAMMING

Course	Subject Title	Subject Code	Grade for End Sem.		CGPA at the end of every even semester
			T	P	
B.E.	Fundamental of Linux & Shell Programming	CS5006	Min. "D"	Min. "D"	5.0

Units - I: Introduction:

Introduction to Open Source technology, different flavors of Linux (ex:- Red Hat , Fedora, Ubuntu), Files System hierarchy, Logging in, changing password (passwd command only), longname, man, xman, date, cal, time, banner, info commands to access on line help. Simple commands like ls, cp, mv, wc, sort, tsort, cat, cut, grep, dd, head, tail, uniq, diff, echo, touch, which, whereis, whatis, type, who, whoami, finger, w (option and variations included), tty, ,uname, printf, ps, pwd , history, exec, kill, pkill, clear, lpstate, cancel, compress, uncompress, exit. Directory commands like: Brief introduction to file system, mkdir, dir, cd, df, dfspace, du, ll, dirname, rmdir, dir access permission, changing access permission for files and directories like: chmod, chgrp, chown, hard & soft links. Environments and path setting. I/O redirection & piping commands II vi editor: General startup of vi editor and it modes

Unit- II :VI Editor:

General start-up of vi editor and it modes , Creating and editing files, features of vi, screen movement , cursor movement, insertion, deletion, searching, submitting operations, yank, put, delete commands, reading & writing files, exrc file for setting parameters, advance editing techniques, vim (improved vi).

Unit- III: Introduction to X-window system:

x-window as client/ server system, concept of window manager, remote computing & local displays, xinitrc file, customize X work environment and application, customizing the fvwm window manager. Introduction to package management using yum technology and rpm command, Browsing internet using Mozilla Firefox and elinks tool.

Unit- IV: Shell:

meaning and purpose of shell, introduction to types of shell. The command line, standard input and standard output , redirection , pipes , filters special characters for searching files and pathnames. Bourne Again .

Shell: shell script-writing and executing, command separation & grouping, redirection, directory stack manipulation, processes, parameters & variables, keyword variables. Introduction Korn Shell and C Shell .

Unit –V:

Shell Programming: Control structures, the Here document, expanding NULL or USET variables, Bulitins , functions, history , aliases, job control, file substitution, source code management- RCS and CVS. awk utility.

Books References:

1. UNIX concepts and applications- Sumitabha Das. Mc-Graw-Hill publications.
2. Linux Programming foreword by Alan Cox.

3. Unix Shell programming- Yashwant Kanetkar. PBP publications.
4. Red Hat Linux. David Pitt.

FUNDAMENTAL OF LINUX & SHELL PROGRAMMING

List of Experiment:

1. Installation, Configuration & customizations of Unix/Linux.
2. To study basic & user status related Unix/Linux commands.
3. Study of directory & file related commands.
4. Study & use of use of command for performing arithmetic operations with Unix/Linux.
5. Create a file called count.txt with some lines& display of many lines, word & character are present in the file.
6. Given two file each of which contains names of students. Create a program to display only those names that are found on both the files.
7. Create a program to find out the inode number of any desired file.
8. Study & use of the command for changing file permissions.
9. Execute shell commands through VI editor.
10. Write a shell script to calculate functional of a numbers.
11. Write a shell script to find largest of three numbers.
12. Write a shell script that reports the logging in of a specified user within one minute after he/she logs in. The script automatically terminates the specified user does not login during a specified period of time.