Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonepat)

SCHEME OF STUDIES & EXAMINATIONS

B.Tech. 4th YEAR (SEMESTER –VIII) COMPUTER SCIENCE AND ENGINEERING

Choice Based Credit System Scheme of Studies & Examinations w.e.f. 2021-22

Sl. No.	Course Code	Course Title	Teaching Schedule			Marks of Class work	Examination Marks		Total	Credits	Duration of Exam
			L	T	P		Theory	Practical			
1.	CSE402C	Advanced Computer Architecture (Gr. A)	3	0	0	25	75	0	100	3	3
2.	CSE404C	Software Project Management (Gr. A)	3	0	0	25	75	0	100	3	3
3.	CSE482C	Project-II (Gr. A)	0	0	18	50	0	100	150	09	3
		Or									
	CSE484C	Professional Training (Level-4) (Gr. B)	0	0	0	100	0	250	350	15	3
4.	GPCSE	General Fitness for the Profession	0	0	0	0	0	100	100	0	0
Total (Gr. A)			**6**	**0**	**18**	**100**	**150**	**200**	**450**	**15**	**9**
Total (Gr. B)			**0**	**0**	**0**	**100**	**0**	**350**	**450**	**15**	**3**

NOTE:

1. Gr. A students will have to do project in the department under the supervision of faculty member along with two subjects at sr. no. 1 and 2.
2. Gr. B students will have to undergo Professional Training (Level-4) of at least one semester from the industry, institute, research lab, training centre etc. Students who have CGPA of minimum 7.0 till VI sem. with no backlog will only be permitted to proceed for Professional Training.
3. Each student will be allotted a supervisor from the deptt for both project as well as professional training.
4. Internal evaluation of Project –II and Professional Training (Level-4) will be carried out four times in a semester.
5. General Fitness For The Profession(GPCSE) is a compulsory & qualifying course **(Audit Pass)** under which student will be evaluated for his performance in all types of activities like Academics, Cultural, Sports, NSS, organisation of camps, social activities etc., during his all 8 semesters, at the end of 8th semester. Regarding this course student will be motivated during the induction programme at the time of admission, so that he/she will be vigilant for motivation towards these activities.The evaluation of the student for his / her General Fitness for Profession shall be carried out by a team consisting of:-
    - Dean FIT&CS
    - Chairperson of the Department
    - Senior Most faculty of the department
    - Senior Most faculty of the University other than the department
6. Students will be allowed to use non-programmable scientific calculator. However, sharing of calculators will not be permitted in the examinations.

TOTAL CREDITS

B.Tech. (CSE) = 159 (including first year)

Semester	1	2	3	4	5	6	7	8	Total
Credit	20	18	21	21	24	19	21	15	159

TOTAL CREDITS

B.Tech. (Hons.) in CSE with specialization in selected areas = 177 (including first year)

Semester	1	2	3	4	5	6	7	8	Total
Credit	20	18	21	21	29	27	26	15	177

CSE482C PROJECT-II

B. Tech. Semester – VIII (Computer Science and Engg.)

L	T	P	Credits			
-	-	18	9	Class Work	:	50 Marks
				Examination	:	100Marks
				Total	:	150 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

1. To align student‟s skill and interests with a realistic problem or project
2. To understand the significance of problem and its scope.
3. Students will make decisions within a framework

Project involving design/ fabrication/ testing/ computer simulation/ case studies etc. will be evaluated through a panel of examiners consisting of the following:

Chairman of Department	Chairperson
Project coordinator	Member Secretary
Respective project supervisor	Member

The student will be required to submit two copies of his/her project report to the department for record (one copy each for the department and participating teacher).

Project coordinator will be assigned the project load of maximum of 2 hrs. per week including his own guiding load of one hr. However, the guiding teacher will be assigned maximum of one period of teaching load irrespective of number of students/groups under him/her. Internal evaluation will be carried out four times in a semester.

The format of the cover page and the organization of the body of the report for all the B.Tech. will be finalized and circulated by the Dean, Faculty of Engineering and Technology.

Course Outcomes:

After completing the course the students will be able to:

1. Develop the professional quality of employing technical knowledge obtained in the field of Engineering & Technology.
2. Design and make analysis augmented with creativity, innovation and ingenuity.
3. Develop an understanding on how to work in actual industry environment.
4. Utilise the technical resources and write the technical report.

CSE484C PROFESSIONAL TRAINING (LEVEL-4)
B. Tech. Semester – VIII (Computer Science and Engg.)

L	T	P	Credits			
-	-	-	15	Class Work	:	100 Marks
				Examination	:	250Marks
				Total	:	350 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

1. Acquire knowledge of the industry in which the internship is done.
2. Apply knowledge and skills learned in the classroom in a work setting.
3. To decide the future application areas of Computer Science and Engineering.

Pre-requisite: Students will have to undergo Professional Training (Level-4) of at least one semester from the industry, institute, research lab, training centre etc. who have CGPA of minimum 7.0 till VI sem. with no backlog will only be permitted to proceed for Professional Training.

In the 8th semester student can opt for Professional Training in an Industry/ Institute/ Professional / Organization/ Research Laboratory etc. with the prior approval and submit a typed report in the department along with a certificate from the organization.

The student will be assigned internal supervisor from the department who will be responsible for internal evaluation and interaction with the industry/place of training. Internal evaluation will be carried out four times in semester.

The final report should be in a prescribed format. The final internal evaluation will be done by a Committee consisting of three teachers from different specialization to be constituted by the Chairperson of the department. The basis of evaluation will primarily be the technical knowledge and exposure of the student towards different processes and the functioning of the organization along with the presentation to demonstrate his/her learning.

Internal supervisor will be assigned 2 periods per week load.

Course Outcomes:

After completing the course the students will have:

1. An ability to apply knowledge of mathematics, science, and engineering.
2. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
3. An ability to function on multidisciplinary teams and to identify, formulate, and solve engineering problems.
4. An understanding of professional and ethical responsibility.

CSE401C ADVANCED COMPUTER ARCHITECTURE

B. Tech. Semester – VIII (Computer Science and Engg.)

L	T	P	Credits			
3	0	--	3	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

1. To learn the concept of modern computers along-with performance analysis measures.
2. To understand the architectures of various processor types of processors.
3. To explore the paradigms of memory organization.
4. To understand the concepts of parallelization techniques for processing of instructions.

UNIT-I

Introduction: Elements of modern computers (computing problems, algorithms, hardware, OS, system software); Evolution of computer architecture; Factors affecting system performance; architectural development tracks (Multiple-processor tracks, Multivector & SIMD tracks, Multithread & Dataflow tracks) Conditions of parallelism (Data dependence, Resource dependence, control dependence, Bernstein's Conditions); Hardware & Software parallelism; Program partitioning & Scheduling; Program flow machines (Control flow, Data flow, Demand driven); Parallel processor applications; Speedup performance laws (Amdahl's law, Gustafson's law); Scalability (Goals, Metrics, evolution of scalable architectures, open issues)

UNIT-II

Advanced processor Technology: Design space; Instruction pipelines; Instruction set architecture (RISC, CISC, RISC scalar processors, CISC scalar processors); Superscalar Processors, VLIW architecture; Vector & Symbolic processors; Pipelining: Linear pipeline processors, Nonlinear pipeline processors, Instruction pipeline(pipelined instruction processing, mechanisms for instruction pipelining, dynamic instruction

scheduling, branch handling techniques) Parallel & Scalable Architectures: Hierarchical bus system, Crossbar switch & multiport memory, multistage & combining networks; Cache coherence & synchronization mechanisms (cache coherence problem, Snoopy bus protocols, directory based protocols.

UNIT-III

Advanced Memory Technology: Bus system (Backplane bus specification, addressing & timing protocols, Arbitration, Transaction and Interrupt, IEEE futurebus) Cache organizations (Cache addressing models, cache performance issues); Shared memory organizations (Interleaved memory organization, Bandwidth and fault tolerance, memory allocation schemes, Sequential & weak consistency models. Latency hiding techniques.

UNIT-IV

Parallel Models and Languages: Parallel Programming Models (Shared-Variable, Message passing, Data-Parallel, Object-Oriented); Parallel languages & Compilers (language features for parallelism, parallel language constructs, optimizing compilers for parallelism); Code optimization & partitioning (Scalar optimization, Local & Global optimization, Vectorization, code generation & scheduling, Trace scheduling compilation); Parallel programming environments (S/W Tools, Y-MP, Paragon, CM-5 Environments , Visualization & Performance tuning)

TEXT /REFERENCE BOOKS:

1. **Advance Computer Architecture: Parallelism, Scalability, Programmability; 2nd Edition by Kai Hwang & Naresh Jotwani, 2012, TMH.**
2. **Pipelined and Parallel processor design by Michael J. Fiynn – 1995, Narosa.**

Note:

In semester Examinations, the examiner will set two questions from each unit (total 8 questions in all) covering the entire syllabus. The students will be required to attempt only five questions selecting at least one question from each unit.

For students admitted in B Tech 1st year (C-Scheme) in 2019 and all training students:

Examination and evaluations of students shall be conducted as per guidelines *AICTE Examinations reforms* covering the entire syllabus. The students shall be made aware about the reforms.

Course Outcomes:

After successful completion of the course, a student should be able to:

1. Have an understanding of concept of modern computers along-with performance analysis measures.
2. Have an ability to identify the architectures of various processor types of processors.
3. Understand the paradigms of memory organization.
4. Understand the concepts of simultaneous processing of instructions.

CSE404C SOFTWARE PROJECT MANAGEMENT

B. Tech. Semester – VIII (Computer Science and Engg.)

L	T	P	Credits			
3	-	-	3	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:

1. To explain needs for software specifications and to study different types of software requirements gathering techniques.
2. To convert the requirements model into the design model and demonstrate use of software and user interface design principles.
3. To justify the role of SDLC in Software Project Development and to study risks associated with a project.
4. To generate project schedule and can construct, design and develop network diagram for different type of Projects.

UNIT- I

Introduction to Software Project Management (SPM): Definition of a Software Project (SP), SP Vs. other types of projects activities covered by SPM, Fundamentals of Software Project Management (SPM), Need Identification, Vision and Scope document, Project Management Cycle, SPM Objectives, project as a system, management control, requirement specification, information and control in organization, Project management and CMM.

Stepwise Project planning: Introduction, selecting a project, identifying project scope and objectives, identifying project infrastructure, analyzing project characteristics, identifying project products and activities, estimate efforts each activity, identifying activity risk, allocate resources, review/ publicize plan.

UNIT- II

Project Evaluation & Estimation:- Cost benefit analysis, cost benefit evaluation techniques, risk evaluation. Selection of an appropriate project approacht;, structured methods, rapid application development, water fall-, V-process-, spiral-models. Prototyping, delivery. Albrecht function point analysis.

Project Scheduling:- Objectives of activity planning, project schedule, projects and activities, Identifying activities, sequencing and scheduling activities, network planning model, Network Diagrams, CPM**,** representation of lagged activities, backward and forward pass, identifying critical path, activity throat, shortening project , precedence networks.

Risk Management:- Introduction, the nature of risk, managing risk, risk identification, risk analysis, reducing the risks, evaluating risks to the schedule, calculating the z values.

UNIT- III

Project Monitoring & control:- identifying resource requirements, scheduling resources, PERT, Gantt Charts, Earned Value Analysis, Earned Value Indicators: Budgeted Cost for Work Scheduled (BCWS), Cost Variance (CV), Schedule Variance (SV), Cost Performance Index (CPI), Error Tracking, Software Reviews, Types of Review: Inspections, Deskchecks, Walkthroughs, Code Reviews, Pair Programming.

Managing contracts and people-: Introduction, types of contract, stages in contract, placement, typical terms of a contract, contract management, acceptance, Managing people and organizing terms: Introduction, understanding behavior, organizational behavior: a back ground, selecting the right person for the job, instruction in the best methods, motivation, working in groups, becoming a team, decision making, leadership, organizational structures, conclusion, further exercises.

UNIT- IV

Software quality Assurance and Testing:- Testing Objectives, Testing Principles, Test Plans, Test Cases, Types of Testing, Levels of Testing, Test Strategies, Program Correctness, Program

Verification & validation, Concept of Software Quality, Software Quality Attributes, Software Quality Metrics and Indicators, The SEI Capability Maturity Model CMM), SQA Activities, Formal SQA Approaches: Proof of correctness, Statistical quality assurance, Clean room process.

Software Project Management Tools:- CASE Tools, Planning and Scheduling Tools, MS-Project.

TEXT/ REFERENCE BOOK:

1. **Software Project Management (2nd Edition), by Bob Hughes and Mike Cotterell, 1999, TMH**
2. **Software Engineering – A Practitioner's approach, Roger S. Pressman (5th edi), 2001, MGH**
3. **Software Project Management, Walker Royce, 1998, Addison Wesley.**
4. **Project Management 2/c. Maylor**
5. **Managing Global software Projects, Ramesh, 2001, TMH.**
6. **S. A. Kelkar, Software Project Management, PHI Publication.**

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Course Outcomes: After completing the course the students will be able to:

1. Explain needs for software specifications and different types of software requirements gathering techniques.
2. Convert the requirements model into the design model and demonstrate use of software and user interface design principles.

3. Justify the role of SDLC in Software Project Development and identify the risks associated with a project.
4. Generate project schedule and can construct, design and develop network diagram for different type of Projects.