

**Scheme of Teaching and Examination for  
III Semester DIPLOMA in COMPUTER SCIENCE & ENGINEERING BRANCH**

**THEORY**

SL. No	SUBJECTS	SUBJECT CODE	TEACHING SCHEME		EXAMINATION SCHEME					
			Periods per Week	Periods in one Session	Hours of Exam.	Terminal Exam. (A) Marks	Final Exam. (B) Marks	Total Marks (A+B)	Pass Marks Final Exam.	Pass Marks in the Subject
1	Professional Mathematics	00301	6	60	3	20	80	100	26	36
2	Engineering Mechanics	00302	4	50	3	20	80	100	26	36
3	Computer Programming Through 'C'	00303	4	50	3	20	80	100	26	36
4	Computer Organisation & Architecture	18304	4	50	3	20	80	100	26	36
5	Operating System	18305	4	50	3	20	80	100	26	36
Total :-			22					500		

**PRACTICAL**

SL. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME		EXAMINATION SCHEME					
			Periods per Week	Periods in one Session	Hours of Exam.	Marks Internal Exam. (A)	Marks External Exam. (B)	Total Marks (A+B)	Pass Marks Final Exam.	Pass Marks in the Subject
6	Engineering Mechanics Lab.	00306	4	50	3	10	40	50	16	21
7	Computer Programming Through 'C'	00307	6	60	3	10	40	50	16	21
8	Computer Organisation & Architecture	18308	4	50	3	10	40	50	16	21
Total :-			14					150		

**SESSIONAL**

SL. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME		EXAMINATION SCHEME			
			Periods per Week	Periods in One Session	Marks of Internal Examiner (X)	Marks of External Examiner (Y)	Total Marks (X+Y)	Pass Marks in the Subject
9	Operating System	18309	6	60	40	60	100	50
Total :-			6				100	

<b>Total Periods per Week</b>		<b>42</b>	<b>Total Marks</b>				<b>750</b>
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# PROFESSIONAL MATHEMATICS

<b>Subject Code</b> <b>00301</b>	<b>Theory</b>			<b>No of Period in one session : 60</b>		
	<b>No. of Periods Per Week</b>			<b>Full Marks</b>	<b>:</b>	<b>100</b>
	<b>L</b>	<b>T</b>	<b>P/S</b>	<b>Annual Exam.</b>	<b>:</b>	<b>80</b>
	<b>06</b>	<b>00</b>	<b>00</b>	<b>Internal Exam.</b>	<b>:</b>	<b>20</b>

**Rationale:**

A technical diploma holder is engaged generally as first line supervisor. He forms a bridge between workers and management. He has to understand the language of the modern management and communicate with the workers in their language. This subject will help accomplishment of the task in stipulated time, develop attitude towards cost effectiveness, selection of most effective alternative methods. This course will also help the student to tackle different numerical methods and computational techniques for problem solving in research organization as a programmer.

**Objective:**

- The course enables students to.
- Managerial skill based on mathematical footing
  - The ability to find approximate solutions and/or answers to the problems where analytical methods become more complex.
  - To choose correct numerical techniques for a given problem.

<u>S.No.</u>	<u>Topics</u>	<u>Periods</u>
01	GROUP –A (Numerical Methods)	<b>(20)</b>
02	GROUP-B (Statistical Techniques)	<b>(20)</b>
03	GROUP-C (Management Techniques)	<b>(20)</b>
<b>Total:</b>		<b>(60)</b>

**CONTENTS:**

**GROUP-A (NUMERICAL METHODS) (20)**

- 01.01 Introduction to Numerical methods: Approximation and errors (Truncation & Round off).
- 01.02 Numerical solutions of non-linear and Transcendental equations: Iterative methods. Newton-Raphson’s method. Bisection method and Regula-Falsi method.
- 01.03 Solution of Linear Simultaneous Equations: Gaussian Elimination method and Gauss-Jordan method.
- 01.04 Finite Difference: Backward and forward Differences. Finite Difference Interpolation Formula. Newton’s Forward Difference formula and Newton’s Backward Difference formula.
- 01.05 Numerical Differentiation & Integration: Newton’s forward and backward differentiation formula. Trapezoidal Rule and Simpson’s 1/3 rule for numerical integration.
- 01.06 Difference equations. simple problem Only

**GROUP-B (STATISTICAL TECHNIQUES) [20]**

- 02.01 Introduction to statistics: Measure of central tendencies: measures of dispersions: standard deviation and variance for discrete and grouped data: assumed mean and step deviation methods.
- 02.02 Theory of Probability: Random events and their types. Probability of Events. Definitions. Laws of Probability (Addition and Multiplication Laws)
- 02.03 Probability Distribution: Introduction to Arithmetic Mean and Standard Deviation of a probability distribution. Important probability distribution – Binomial distribution. Poisson’s distribution & Their means and variance.

**GROUP-C (MANAGEMENT TECHNIQUES) [20]**

- 03.01 Linear Models
- 03.01.01 Introduction to Operations Research (O.R) Steps of O.R.
- 03.01.02 Linear Programming Problems: Formulation of a LPP. Mathematical Modelling and Solution by graphical method.
- 03.01.03 Solution by Simplex Method: Basic Feasible Solution (Degenerator and Non-degenerator)
- 03.01.04 Transportation problem: Introduction and Solution Procedure-
  - (i) Finding the initial basic feasible solution by N-W Corner Rule, Least cost method and Vogel’s Approximation Method.
  - (ii) Test of optimality by **u-v** method only.

- 03.01.05 Assignment Problem: Introduction and Solution Procedure–Fundamental theory underlying Hungarian Method.
- 03.02 Network Analysis. CPM & PERT: Introduction.
- 03.02.01 Basic concepts – Activities. Nodes. Edges. Networking of a project. Various times calculations. CPM to determine the optimal project schedule.
- 03.02.02 PERT- Definition, difference between CPM & PERT. Pessimistic times, optimistic times. Most likely times of various activities.

**Books Recommended: Text Books**

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|----|---|---|--|
| 1. | Operations Research. Sultan Chand & Sons, New Delhi, 1990     | - | Kanti Swaroop. P.K Gupta and Man Mohan |
| 2. | Operations Research. Sultan Chand & Sons, New Delhi, 1990     | - | Heera & Gupta                          |
| 3. | Operations Research. Macmillan Publishing Co. New York, 1982  | - | H.A.Taha                               |
| 4. | Computer based numerical algorithm, East West Press, 1975     | - | E.V Krishna Murthy & S.V. Sen          |
| 5. | Computer oriented numerical method, Prentice Hall India, 1980 | - | V. Rajaraman                           |

# ENGINEERING MECHANICS

<b>Subject Code</b> <b>00302</b>	<b>Theory</b>			<b>No of Period in one session : 50</b>		
	<b>No. of Periods Per Week</b>			<b>Full Marks</b>	<b>:</b>	<b>100</b>
	<b>L</b>	<b>T</b>	<b>P/S</b>	<b>Annual Exam.</b>	<b>:</b>	<b>80</b>
	<b>04</b>	<b>00</b>	<b>00</b>	<b>Internal Exam.</b>	<b>:</b>	<b>20</b>

**Rationale:**

The subject forms an important part of Engineering curricula for developing the concepts required in the design of various structures. The subject deals with the basic concept of mechanic of body and the behaviour of material used in practice and in structures under varying load conditions. The first part of the subject deals with the applied mechanics science. Which describe the condition of body in rest or motion under the action of forces. In its preview come variety of general and specialized engineering disciplines concerned with analysis of structures and machines and the mechanism of their parts.

In the Second part, the principles of strength of materials is introduced in which the student will learn to distinguish between different types of stress and strain and also the qualitative assessment of stress and strains in material element under the action of internal forces.

**Objective:**

Knowledge Workers will be able to:

- Analyze and understand the physical behaviour of members of engineering structures.
- Acquire knowledge of various elements of structures.
- Utilise the basic principles.
- Develop skill to tackle field problem.
- Solve the problems by the application of basic principles.
- Judge the suitability of materials in design process.

<u>S.No.</u>	<u>Topics</u>	<u>Periods</u>
<b><u>PART-A</u></b>		
01	Introduction	(02)
02	Vector Methods	(02)
03	Introduction to system of forces and equilibrium	(06)
04	Friction	(04)
05	Kinematics and kinetics of a particle	(03)
06	Kinematics and kinetics of rigid body	(02)
07	Impulse and Momentum	(02)
08	Work, Energy and Power	(04)
<b>Total :</b>		<b>(25)</b>
<b><u>PART-B</u></b>		
01	Simple stress and strains	(07)
02	Elastic constants	(03)
03	Center of Gravity (Centroid)	(02)
04	Moment of Inertia	(05)
05	Shearing force and bending moments	(08)
<b>Total :</b>		<b>(50)</b>

**CONTENTS:**

**PART-A**

**TOPIC: 01 – INTRODUCTION:** [02]

Idealisation of mechanics; Concept of rigid body; External forces (Body forces & surface forces) Law of Mechanics.

**TOPIC: 02 VECTOR METHODS:** [02]

Equality and equivalence of vectors; Free and Bound vector; Moment of a force about a point and a line; Couple and moment of a couple.

**TOPIC: 03 – INTRODUCTION TO SYSTEM OF FORCES AND EQUILIBRIUM:** [06]

Statically equivalent force system; simplest equivalent of a system of forces; force analysis, free body diagram, equation of equilibrium.

<b><u>TOPIC: 04 – FRICTION:</u></b>	[04]
Basic Concept of different Friction (Static, Dynamic, Sliding, Rolling, Fluid).	
<b><u>TOPIC: 05 – KINEMATICS AND KINETICS OF A PARTICLE:</u></b>	[03]
Rectilinear and curvilinear translations; normal and tangential component of acceleration.	
<b><u>TOPIC:06 – KINEMATICS AND KINETICS OF RIGID BODY:</u></b>	[02]
Simple concept of Angular Velocity and angular acceleration. Effective forces on a rigid body. D’ Alembert’s principle.	
<b><u>TOPIC:07 – IMPULSE AND MOMENTUM:</u></b>	[02]
Linear impulse and linear momentum, angular impulse and angular momentum, definitions only;	
<b><u>TOPIC: 08 – WORK, ENERGY AND POWER:</u></b>	[04]
Work done by forces and couples, potential and kinetic energy, work-energy; conservation of energy; concept of power and efficiency.	

**PART-B**

<b><u>TOPIC: 01 – SIMPLE STRESSES &amp; STRAIN:</u></b>	[07]
01.01 Definition of various terms and their units (S.I. Units)	
01.02 Stress and strain due to axial load and transverse load relation between stress and strain. Hook’s law. Studies of stress strain curve. Factor of safety & working stress. Concepts of isotropic materials.	
01.03 Stress & strain in simple section & composite bar. Stress & strain due to temperature variation.	
01.04 Shrinking on hoop’s stresses.	
<b><u>TOPIC: 02 – ELASTIC STRESS &amp; STRAIN:</u></b>	[03]
02.01 Linear strain and lateral strain, poisson’s ratio, volumetric strain	
02.02 Change in volume due to axial, biaxial & triaxial loading. Bulk modulus.	
02.03 Shear stress and strain, modulus of rigidity.	
02.04 Simple shear. Complementary shear stress.	
02.05 Various Relations among modulus of elasticity, modulus of rigidity & bulk modulus.	
<b><u>TOPIC: 03 – CENTER OF GRAVITY (CENTROID):</u></b>	[02]
03.01 Definition of center of gravity & centroid.	
03.02 Determination of C.G of various sections symmetrical and unsymmetrical sections.	
03.03 Determination of C.G. of perforated sections.	
<b><u>TOPIC: 04 – MOMENT OF INERTIA:</u></b>	[05]
04.01 Definition of M.I.; radius of gyration, second moment of area.	
04.02 Parallel axis theorem & perpendicular axis theorem.	
04.03 Derivation of M.I. of regular area-rectangular, triangular circular about centroidal axis.	
04.04 M.I. of built up section, symmetrical and unsymmetrical about centroidal axis, modulus of sections.	
<b><u>TOPIC: 05 – SHEARING FORCE &amp; BENDING MOMENT:</u></b>	[08]
05.01 Types of beams and types of supports, types of loading.	
05.02 Concept and definitions of shear force and bending moment, sign convention.	
05.03 Shear force and bending moment diagrams for cantilever, simply supported beam, over hanging beam for various types of loading & couples, point of contraflexure.	
05.04 Relation between B.M, S.F. and rate of loading.	

**Books Recommended:**

**Text Books**

1. Strength of Materials	- R.S. Khurmi
2. Mechanics of Structure	- S.B. Junarkar
3. Strength of Materials	- Ramamrutham
4. Theory of Structure	- Vazirini & Ratwani
5. Strength of Materials & Mechanics of Structure.	- Punamia
6. Teaching plans of Strength of Material	- T.T.T.I. Madras
7. द्रव्य सामर्थ्य	- गुरुचरण सिंह
8. Engineering Mechanics	- I.H. Shames
9. Engineering Mechanics	- Beer & Johnson
10. Strength of material	- S.K. Singh

# COMPUTER PROGRAMMING THROUGH C

<b>Subject Code</b> <b>00303</b>	<b>Theory</b>			<b>No of Period in one session : 50</b>		
	<b>No. of Periods Per Week</b>			<b>Full Marks</b>	<b>:</b>	<b>100</b>
	<b>L</b>	<b>T</b>	<b>P/S</b>	<b>Annual Exam.</b>	<b>:</b>	<b>80</b>
	<b>04</b>	<b>00</b>	<b>00</b>	<b>Internal Exam.</b>	<b>:</b>	<b>20</b>

**Rationale:**

Computers play a vital role in present day life, more so, in the professional life of technician engineers. In order to enable the students use the computers effectively in problem solving, this course offers the modern programming language C along with exposition to various engineering applications of computers.

**Objective:**

The objectives of this course are to make the students able to:

- Develop efficient algorithms for solving a problem.
- Use the various constructs of a programming language viz. conditional, iteration and recursion.
- Implement the algorithms in “C” language.
- Use simple data structures like arrays, stacks and linked list solving problems.
- Handling File in “C”.

<u>S.No.</u>	<u>Topics</u>	<u>Periods</u>
01	Introduction to Programming	(03)
02	Algorithm for Problem Solving	(08)
03	Introduction to ‘C’ Language	(08)
04	Condition and Loops	(07)
05	Arrays	(07)
06	Functions	(07)
07	Structures and Unions	(04)
08	Pointers	(06)
<b>Total :</b>		<b>(50)</b>

**CONTENTS:**

**TOPIC: 01 – INTRODUCTION TO PROGRAMMING: [03]**

The Basic Model of Computation, Algorithms, Flow-charts, Programming Languages, Compilation, Linking and Loading, Testing and Debugging, Documentation. Programming Style-Names, Documentation & Format, Refinement & Modularity.

**TOPIC: 02 – ALGORITHM FOR PROBLEM SOLVING: [08]**

Exchanging values of two variables, summation of a set of numbers. Reversing digits of an integer, GCD (Greatest Common Division) of two numbers. Test whether a number is prime. Organize numbers in ascending order. Find square root of a number, factorial computation, Fibonacci sequence. Compute sine Series. Check whether a given number is Palindrome or not. Find Square root of a quadratic equation. multiplication of two matrices,

**TOPIC: 03 – INTRODUCTION TO ‘C’ LANGUAGE: [08]**

- 03.01 Character set, Variable and Identifiers, Built-in Data Types, Variable Definition, Declaration, C Key Words-Rules & Guidelines for Naming Variables.
- 03.02 Arithmetic operators and Expressions, Constants and Literals, Precedence & Order of Evaluation.
- 03.03 Simple assignment statement. Basic input/output statement.
- 03.04 Simple ‘C’ programs of the given algorithms

**TOPIC: 04 – CONDITIONAL STATEMENTS AND LOOPS: [07]**

- 04.01 Decision making within a program
- 04.02 Conditions, Relational Operators, Logical Perator.
- 04.03 If statement, it-else statement.
- 04.04 Loop statements
- 04.05 Break, Continue, Switch

**TOPIC: 05 – ARRAYS: [07]**

What is an Array?, Declaring an Array, Initializing an Array.  
One dimensional arrays: Array manipulation: Searching, Insertion, Deletion of an element from an array; Finding the largest/smallest element in array; Two dimensional arrays, Addition/Multiplication of two matrices.

**TOPIC: 06 – FUNCTIONS:****[07]**

Top-down approach of problem solving. Modular programming and functions, Definition of Functions Recursion, Standard Library of C functions, Prototype of a function: Formal parameter list, Return Type, Function call, Passing arguments to a Function: call by reference; call by value.

**TOPIC: 07 – STRUCTURES AND UNIONS:****[04]**

Basic of Structures, Structures variables, initialization, structure assignment, Structures and arrays: arrays of structures,

**TOPIC: 08 – POINTERS:****[06]**

Concept of Pointers, Address operators, pointer type declaration, pointer assignment, pointer initialization pointer arithmetic.

**Book Recommended:**

1. Programming with C. Second Edition. Tata McGraw-Hill, 2000 - Byron Gottfried
2. How to solve by Computer, Seventh Edition, 2001, Prentice hall of India. - R.G. Dromey
3. Programming with ANSI-C, First Edition, 1996, Tata McGraw hill. - E. Balaguruswami
4. Programming with ANSI & Turbo C. First Edition, Pearson Education. - A. Kamthane
5. Programming with C. First Edition, 1997, Tara McGraw hill. - Venugopla and Prasad
6. The C Programming Language, Second Edition, 2001, Prentice Hall of India. - B. W. Kernighan & D.M. Ritchie
7. Programming in C, Vikash Publishing House Pvt. Ltd., Jungpura, New Delhi. - R. Subburaj
8. Programming with C Language, Tara McGraw Hill, New Delhi. - C. Balagurswami
9. Elements of C, Khanna Publishers, Delhi. - M. H. Lewin
10. Programming in C. - Stephen G. Kochan
11. Programming in C, khanna Publishers, Delhi. - B. P. Mahapatra
12. Let us C, BPB Publication, New Delhi. - Yashwant kanetkar
13. Programming in C, Galgotia Publications Pvt. Ltd. Dariyaganj, New Delhi. - Kris A. Jamsa
14. The Art of C Programming, Narosa Publishing House, New Delhi. - Jones, Robin & Stewart
15. Problem Solving and Programming. Prentice Hall International. - A.C. Kenneth
16. C made easy, McGraw Hill Book Company, 1987. - H. Schildt
17. Software Engineering, McGraw Hill, 1992. - R.S. Pressman
18. Pointers in C, BPB publication, New Delhi. - Yashwant Kanetkar

# COMPUTER ORGANISATION & ARCHITECTURE

<b>Subject Code</b> <b>18304</b>	<b>Theory</b>			<b>No of Period in one session : 50</b>		
	<b>No. of Periods Per Week</b>			<b>Full Marks</b>	<b>:</b>	<b>100</b>
	<b>L</b>	<b>T</b>	<b>P/S</b>	<b>Annual Exam.</b>	<b>:</b>	<b>80</b>
	<b>04</b>	<b>00</b>	<b>00</b>	<b>Internal Exam.</b>	<b>:</b>	<b>20</b>

**Rationale:**

This course will enable the students to grasp the working of basic components of computer system. Further the course will help them to learn as to how the basic components interact with each other to form a working system.

**Objective:**

Objective of the course is to familiarize students about hardware and software design including logic design, and basic structure and behavior of the various functional modules of the computers and how they interact to provide the processing needs of the user.

This subject mainly focuses on the hardware and system software. It aims to describe the following aspects:

- Building blocks of the computer
- Computer Design
- Assembly Language Programming

S.No.	Topics	Periods
01	Introduction and Background	( 04 )
02	Register Transfer Language and Micro-operations	( 05 )
03	Architecture of a Simple Processor	( 06 )
04	CPU Organization	( 06 )
05	Assembly Language Programming	( 07 )
06	Micro programmed Control Unit	( 07 )
07	Arithmetic Algorithms	( 04 )
08	I/O Organization	( 05 )
09	Memory Organization	( 06 )
	<b>Total :</b>	<b>( 50 )</b>

**CONTENTS:**

**TOPIC: 01 – INTRODUCTION AND BACKGROUND: [ 04 ]**

- 01.01 Evolution of Computers
- 01.02 Stored Program concept and Von Neumann Architecture
- 01.03 Information Representation and Codes
- 01.04 Building blocks of Computers(Combinational blocks: gates, multiplexers, decoders, encoders etc., Sequential Building Blocks: Flip flops, registers, counters, random access memory etc.

**TOPIC: 02 – REGISTER TRANSFER LANGUAGE AND MICRO-OPERATIONS: [ 05 ]**

- 02.01 Concept of bus, Data movement among registers.
- 02.02 A language to represent conditional data transfer
- 02.03 Data movement from/to memory
- 02.04 Arithmetic and logical operations along with register transfer
- 02.05 Timing in register transfer

**TOPIC: 03 – ARCHITECTURE OF SIMPLE PROCESSOR: [ 06 ]**

- 03.01 A simple computer organization and Instruction set.
- 03.02 Instruction execution in terms of microinstructions
- 03.03 Concept of Interrupt and simple I/O organisation
- 03.04 Implementation of the processor using building blocks

**TOPIC: 04 – CPU ORGANISATION: [ 06 ]**

- 04.01 Address modes Instruction formats.
- 04.02 Instruction formats
- 04.03 CPU organisation with large registers
- 04.04 Stacks and handling of interrupts and subroutines
- 04.05 Instruction pipelining : stages, hazards and methods to remove hazards



**TOPIC: 05 – ASSEMBLY LANGUAGE PROGRAMMING:** [ 07 ]

- 05.01 Machine and Assembly language.
- 05.02 Pseudo-Operations
- 05.03 Subroutines in assembly language
- 05.04 Interrupt and I/O Programming
- 05.05 Examples

**TOPIC: 06 – MICROPROGRAMMED CONTROL UNIT:** [ 07 ]

- 06.01 Basic organization of micro programmed controller.
- 06.02 Horizontal and vertical formats
- 06.03 Address sequencer

**TOPIC: 07 – ARITHMETIC ALGORITHMS:** [ 04 ]

- 07.01 Addition and Subtraction for sign magnitude and 2's complement numbers.
- 07.02 Integer multiplication using shift and add
- 07.03 Booth's algorithm
- 07.04 Integer Division
- 07.05 Floating point representations and arithmetic algorithms

**TOPIC: 08 – I/O ORGANISATION:** [ 05 ]

- 08.01 Strobe based and handshake based communication.
- 08.02 Vector and priority interrupts
- 08.03 DMA based data transfer

**TOPIC: 09 – MEMORY ORGANISATION:** [ 06 ]

- 09.01 Basic cell of static & dynamic RAM.
- 09.02 Building large memories using chips
- 09.03 Associative memory
- 09.04 Cache memory organisation
- 09.05 Virtual memory organisation

**Books Recommended:**

**Text Books**

- 1 Computer System Architecture, Third Edition, 2000, Pearson Education - M.M. Mano
- 2 Computer System and Architecture, Prentice Hall of India Pvt. Ltd., New Delhi - M. Mano
- 3 Computer Architecture and Organization, McGraw Hill Company, New Delhi - J.P. Hayes
- 4 Computer Organization and Architecture, Prentice Hall of India Ltd., New Delhi - W. Stallings
- 5 Computer System Architecture, Third Edition, 1998, Prentice Hall of India - M. Morris Mano
- 6 Microprocessor Architecture, Programming and Application, Wiley Eastern Limited - Gaonkar

**Reference Books:**

- 1 Computer Architecture & Organization, Third Edition, 1988, McGraw-Hill. - J.P. Hayes  
New York
- 2 Computer Design and Architecture, Second Edition, 1991, Harper Collins - S.G. Siva  
Publishers
- 3 Computer Organization and Design, Prentice Hill of India Ltd., 1994 - P. Pal Choudhary

# OPERATING SYSTEM

<b>Subject Code</b> <b>18305</b>	<b>Theory</b>			<b>No of Period in one session : 50</b>		
	<b>No. of Periods Per Week</b>			<b>Full Marks</b>	<b>:</b>	<b>100</b>
	<b>L</b>	<b>T</b>	<b>P/S</b>	<b>Annual Exam.</b>	<b>:</b>	<b>80</b>
	<b>04</b>	<b>00</b>	<b>00</b>	<b>Internal Exam.</b>	<b>:</b>	<b>20</b>

**Rationale:**

The course provides the students with an understanding of human computer interface existing in computer system and the basic concepts of operating system and its working. Further, good working knowledge to work in Windows and Unix environments is provided by this course.

**Objective:**

The objectives of this course are to make the students able to

- To teach the requirement of Operating System in Computers.
- To teach Windows Operating System and to make familiar with special features of Windows Operating System.
- To teach multi-user Operating System Unix Operating System and Unix File Structure.

S.No.	Topics	Periods
01	Introduction	(02)
02	Process	(08)
03	Inter-process Communication and Synchronization	(07)
04	Memory Management	(07)
05	File Management	(07)
06	Security and Protection	(04)
07	Multi Processor System	(06)
08	Case Studies	(09)
	<b>Total:</b>	<b>(50)</b>

**CONTENTS:**

<b>TOPIC: 01 – INTRODUCTION:</b> Evaluation of Operating Systems, Types of Operating Systems, Different views of the Operating Systems,	[ 2 ]
<b>TOPIC: 02 –PROCESSES:</b> The Process Concept, Systems Programmer’s view of Processes, The Operating System view of Processes, Operating System Services for Process Management, Scheduling algorithms, Performance Evaluation.	[ 8 ]
<b>TOPIC: 03 – INTERPROCESS COMMUNICATION AND SYNCHRONIZATION:</b> The need for inter process synchronization, mutual exclusion, semaphores, Hardware support for mutual exclusion, Classical Problems in concurrent programming, Critical region and conditional critical region, monitors, messages, deadlocks.]	[ 7 ]
<b>TOPIC: 04 – MEMORY MANAGEMENT:</b> 04.01 <b>Contiguous Allocation</b> Single Process Monitor, Partitioned memory allocation static, Partitioned memory allocation-Dynamic, segmentation 04.02 <b>Noncontiguous Allocation</b> Paging, Virtual Memory(allocation policies and replacement policies)	[ 7 ]
<b>TOPIC: 05 –FILE MANAGEMENT:</b> A generalization of file services. Directory structure, command Language uses view of the file System	[ 7 ]
<b>TOPIC: 06 –SECURITY AND PROTECTION:</b> Security threats and goals, penetration, attempts, security policies and mechanisms, authentication, protection and access control, worms and viruses.	[ 4 ]
<b>TOPIC: 07 – MULTI PROCESSOR SYSTEMS:</b>	[ 6 ]

Motivation and classification, multi processor interconnection, types of multi processor operating system, multi processor OS functions and requirements, introduction of parallel computing (distributed operating system) Introduction to multiprocessor synchronization.

**TOPIC: 8 –CASE STUDY:**

[ 3 ]

8.01 **LINUX OPERATING SYSTEM**

Introduction to Linux Operating System. Linux features & Benefits :-

**Introduction to Linux:-** Systems characteristics and requirements with Linux.

**Getting Started:-**System manger, Password, Log in, Log out, running the system.

8.02 **UNIX OPERATING SYSTEM**

Introduction to Unix Operating System. Unix features & Benefits :-

**Introduction to Linux:-** Systems characteristics and requirements with Linux.

**Getting Started:-**System manger, Password, Log in, Log out, running the system.

**File in the Unix System:-** File structure in Unix, Working with file structures, removable file volumes.

**Unix Command Shells:-** Issuing commands, Input handling by the shells, The shell programming language, Running the Unix shells, Pipes, Version of Unix Systems.

**The System Kernel:-** Nature of the Kernel, Process Co-ordinations and Management, Input and Output Operations.

[6]

**Books Recommended:**

- 1 Operating Systems-Concept and Design, McGraw-Hill - Milan Milenkovic  
international Edition-Computer Science Series, 1992
- 2 An introduction to Operating Systems, Addition-Wesley - Harvey M. Deitel  
Publishing Company, 1984.
- 3 Operating System Concepts, Addition-Wesley Publishing - James L. Paterson, Abraham  
Company, 1989. Silberschatz
- 4 Modern Operating Systems, Prentice-Hall of India Private - Andrew S. Tanenbaum  
Ltd., 1995.
- 5 Microsoft Windows Manual -
- 6 First Course in Computers, Vikash Publishing House Pvt. - Sanjay Saxena  
Ltd., Jungpura, New Delhi.
- 7 [WWW.msn.com](http://WWW.msn.com) and linked sites -

# ENGINEERING MECHANICS Lab.

<b>Subject Code</b> <b>00306</b>	<b>Practical</b>			<b>No of Period in one session : 50</b>		
	<b>No. of Periods Per Week</b>			<b>Full Marks</b>	<b>:</b>	<b>50</b>
	<b>L</b>	<b>T</b>	<b>P/S</b>	<b>Annual Exam.</b>	<b>:</b>	<b>40</b>
	<b>04</b>			<b>Internal Exam.</b>	<b>:</b>	<b>10</b>

## Rationale & Objectives:

The Engineering Mechanics Laboratory is a subject which will help technician to understand the application of theory that he has studied in practice by performing experiments and verifying results.

Besides the above the objective of the curriculum with effective skill will be developed in them to observe experimental data, and to analyses the results.

These topics of this curriculum will certainly build their confidence in performing the utilization of principle of mechanics in Civil Engineering works.

## CONTENTS:

Eight experiments to be performed in the laboratory:

1. Determination of elongation of wire under external load.
2. Tensile Test on mild steel specimen.
3. Tensile Test on high tensile specimen.
4. Compression Test on metal.
5. Compression Test on bricks.
6. Determination of Young's Modulus of Elasticity of wire.
7. Determination of reaction at the support of beam.
8. Determination of bending moment of a simply supported beam.
9. Determination of reaction at the support of roof truss.
10. Determination of deflection of beams.
11. Determination of moment of inertia of fly wheel.
12. Determination of bending moment of a over hanging beam.
13. Verification of Polygon Law of forces.
14. Verification of Triangle Law of forces.
15. To find moment of inertia of fly wheel.
16. Compression Test on metal.
17. Tensile Test on M.S.specimen.
18. Determination of co-efficient of friction on inclined plane.

## Books Recommended:

### Text Books

1. अभियांत्रिक यांत्रिकी . जे०के० कपूर
2. Strength of Materials - Bininder Singh
3. Mechanics of Structure, Vol. 1 - S.B. Junarkar
4. Strength of Materials - R.S. Khurmi
5. Engineering Mechanics and Strength of Materials - I.B. Prasad
6. Teaching plans of Strength of Material - T.T.T.I. Madras

# COMPUTER PROGRAMMING THROUGH 'C'

<b>Subject Code</b> <b>00307</b>	<b>Practical</b>			<b>No of Period in one session : 60</b>		
	<b>No. of Periods Per Week</b>			<b>Full Marks</b>	<b>:</b>	<b>50</b>
	<b>L</b>	<b>T</b>	<b>P/S</b>	<b>Annual Exam.</b>	<b>:</b>	<b>40</b>
	<b>06</b>	<b>00</b>	<b>03</b>	<b>Internal Exam.</b>	<b>:</b>	<b>10</b>

## CONTENTS:

### List of Practicals:

1. Programming exercise on executing a C program.
2. Programming exercise on editing C program.
3. Programming exercise on defining variables and assigning values to variable.
4. Programming exercise on arithmetic and relational operations.
5. Programming exercise on arithmetic expressions and their evaluation
6. Programming on infix, postfix, transformation using stack.
7. Programs on array implementation.

### Books Recommended:

- |  |  |
|--|--|
| 1. How to solve it by Computer, Prentice Hall of India, 1992.                | -R.G. Dromey.                              |
| 2. The C Programming Language, Prentice Hall of India, 1989.                 | - B.W. Kernighan & D.M. Ritchie.           |
| 3. The Spirit of C Programming, Jaico Publishing House, New Delhi, 1987.     | - Cooper, Mullish                          |
| 4. Application Programming in C. Macmillain International editions, 1990.    | - Richa'd Johnson-<br>Baugh & Martin Kalin |
| 5. The Art of C Programming, Narosa Publishing House, New Delhi.             | - Jones, Robin & Stewart                   |
| 6. Problem Solving and Programming. Prentice Hall International.             | - A.C. Kenneth.                            |
| 7. C made easy, McGraw Hill Book Company, 1987.                              | - H. Schildt                               |
| 8. Software Engineering, McGraw Hill, 1992.                                  | - R.S. Pressman                            |
| 9. Programming in C, Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi   | - R. Subburaj                              |
| 10. Programming with C language, Tata McGraw Hill, New Delhi.                | - C. Balaguruswami                         |
| 11. Elements of C, Khanna Publishers. Delhi                                  | - M. H. Lewin                              |
| 12. Programming in C   | - Stephan G. Kochan.                       |
| 13. Programming in C, Khanna Publishers. New Delhi                           | - B.P. Mahapatra                           |
| 14. Let us C, BPB Publication. New Delhi                                     | - Yashwant Kanetkar                        |
| 15. Programming in C, Galgotia Publications Pvt. Ltd. Dariyaganj, New Delhi. | - Kris A. Jamsa                            |

# COMPUTER ORGANISATION & ARCHITECTURE

<b>Subject Code</b> <b>18308</b>	<b>Practical</b>			<b>No of Period in one session : 50</b>		
	<b>No. of Periods Per Week</b>			<b>Full Marks</b>	<b>:</b>	<b>50</b>
	<b>L</b>	<b>T</b>	<b>P/S</b>	<b>Annual Exam.</b>	<b>:</b>	<b>40</b>
	<b>04</b>			<b>Internal Exam.</b>	<b>:</b>	<b>10</b>

**List of Practicals:-**

- 01 Write a program in C-language to implement the digital gates. The program should give the truth table of the gate, which is selected by the user from the menu displayed by the program.
- 02 Write a program in C-language to implement division algorithm.
- 03 Write a program in C-language to generate the r's and (r-1)'s complement for a number given in any number system r.
- 04 Give the presentation on 74xx series IC for gates.
- 05 Give the presentation on combinational circuits such as multiplexer, decoder, encoder etc.
- 06 Give the presentation on sequential circuits such as registers, counters etc.
- 07 Give the presentation on the flip-flops i.e. RS-flip-flop, D-flip-flop, JK-flip-flop, T-flip-flop, Master-Slave JK-flip-flop etc.
- 08 Give the presentation on Von Neumann Architecture of a computer system.
- 09 Give the presentation on memory management i.e. virtual memory, cache memory, paging etc.
- 10 Write an assembly language program to find the largest integer from maximum of 15 numbers stored at NUM, defined as consecutive words. The end of the sequence of number is denoted by -9999.
- 11 Write an assembly language program to convert the binary number into hexadecimal number.
- 12 Write an assembly language program to convert binary number to decimal number.
- 13 Write an assembly language program to add two 8-bits numbers in the memory location called NUM1 and NUM2. The result is stored in the memory location called RESULT. If there was a carry from the addition it will be stored as 0000001 in location called CARRY.
- 14 Write an assembly language program to exchange the data between two variables.
- 15 Write an assembly language program, which count the frequency of each decimal digit 0 to 9 of the segment of digits available at DIGIT. The sequence is terminated by character #. Put the frequency of 0 to 9 at FREE in ten consecutive words.
- 16 Write an assembly language program to convert the lower alphabet character after full stop to capital letter if it is a small letter in the string available at MSG.
- 17 Write an assembly language program to multiply the two unsigned binary numbers.
- 18 Write an assembly language program to find the smallest integer from maximum of 15 numbers stored at NUM, defined as consecutive words. The end of the sequence of number is denoted by -9999.
- 19 Write an assembly language program to count the number of spaces character and words in the string available at MSG.

# OPERATING SYSTEM

<b>Subject Code</b> <b>18309</b>	<b>Practical</b>			<b>No of Period in one session : 60</b>		
	<b>No. of Periods Per Week</b>			<b>Full Marks</b>	<b>:</b>	<b>100</b>
	<b>L</b>	<b>T</b>	<b>P/S</b>	<b>Annual Exam.</b>	<b>:</b>	<b>60</b>
	<b>06</b>	<b>0</b>	<b>03</b>	<b>Internal Exam.</b>	<b>:</b>	<b>40</b>

## **LIST OF SESSIONALS:**

1. Demonstrate giving brief history of Operating System, types of Operating Systems in use these days, how it is necessary for a computer functioning..
2. Prepare a report on different views of the Operating System, the journey of a command execution, Design and implementation of Operating System.
3. Prepare a report on memory management of Operating System.
4. Prepare a report on file management of Operating System.
5. Demonstrate the Security and Protection features of an Operating System.
6. Demonstrate the functions of Multi Processor Systems.
7. Demonstrate and produce report on computer network algorithms for distributed processing.
8. Prepare a brief history of Windows Operating System.
9. Demonstrate features, tools and accessories of Windows 98.
10. Prepare a brief report on features and benefits of Unix Operating System.

## **Books Recommended:**

- 1 Operating Systems-Concept and Design, McGraw-Hill international - Milan Milenkovic  
Edition-Computer Science Series, 1992
- 2 An introduction to Operating Systems, Addition-Wesley Publishing - Harvey M. Deitel  
Company, 1984.
- 3 Operating System Concepts, Addition-Wesley Publishing Company, - James L. Paterson, Abraham  
1989. Silberschatz
- 4 Modern Operating Systems, Prentice-Hall of India Private Ltd., 1995. - Andrew S. Tanenbaum
- 5 Microsoft Windows Manual -
- 6 First Course in Computers, Vikash Publishing House Pvt. Ltd., - Sanjay Saxena  
Jungpura, New Delhi.
- 7 [WWW.msn.com](http://WWW.msn.com) and linked sites -
- 8 Unix Programming - Bach