



# UNIVERSITY OF JAMMU

## NOTIFICATION

(18/Oct/Adp/74)

It is hereby notified for the information of all concerned that the Vice-Chancellor, in anticipation of the approval of the Competent Bodies, has been pleased to authorize the adoption of the revised Syllabi and Courses of Studies in **Bachelor of Engineering (E&C Engineering)** for Semester I & II under the **Choice Based Credit System** as per the model curriculum of the **AICTE (as given in the Annexure Pages 01 to 25)** for the candidates of **all (Govt./Pvt./UIET) Engineering Colleges affiliated with the University of Jammu** for the Examinations to be held in the years indicated against each Semester as under :-

Branch	Semester	For the Examination to be held in the years
E&C	Semester-I	December 2018, 2019, 2020 and 2021
	Semester-II	May 2019, 2020, 2021 and 2022

*The Syllabi of the course is available on the University Website: [www.jammuuniversity.in](http://www.jammuuniversity.in).*

s/d-  
DEAN ACADEMIC AFFAIRS

No. F.Acd/III/18/10779-10790

Dated: 31/10/2018

Copy for information & necessary action to:-

1. Dean Faculty of Engineering
2. Principal, GCET/MIET/MBSCET/UIET/BCET/YCET
3. C.A to the Controller of Examinations
4. Assistant Registrar (Exams/Confidential)
5. Section Officer (Confidential)
6. Incharge University Website

Assistant Registrar (Academics)

*[Signature]*

*[Signature]*  
21/10  
31/10  
31/10/18

**B.E. E&C Engineering First Semester Examination to be held in the Year  
December 2018,2019,2020,2021**

**B.E. E&C Engineering 1st Semester**

**Contact Hrs.: 24**

COURSE CODE	COURSE TYPE	COURSE TITLE	LOAD ALLOCATIONS			MARKS DISTRIBUTION		TOTAL MARKS	CREDITS	% CHANGE
			L	T	P	INTERNAL	EXTERNAL			
BSC -101	Basic Science Course	Engineering Mathematics-I	3	2	0	50	100	150	5	100
BSC-102	Basic Science Course	Engineering Physics	3	1	-	50	100	150	4	100
BSC-112	Basic Science Course	Engineering Physics (Lab)	-	-	3	50	-	50	1.5	100
ESC-101	Engineering Science Course	Computer Programming	3	1	-	50	100	150	4	100
ESC-111	Engineering Science Course	Computer Programming (Lab)	-	-	2	50	-	50	1	100
ESC-102	Engineering Science Course	Engineering Graphics	1	-	3	50	100	150	2.5	100
NCC-101	Non- Credit Course	Mentoring and Professional Development	-	-	2	Satisfactory / Un-Satisfactory			Non-Credit	
NCC-102		Environmental Sciences								
NCC-103		Indian Constitution								
TOTAL			10	4	10	300	400	700	18	

*Sanna*

# First Semester Examination to be held in the Year December 2018,2019,2020,2021

CLASS: B.E. 1ST SEMESTER

BRANCH: COMMON TO ALL BRANCHES

COURSE TITLE: ENGINEERING MATHEMATICS-I

CREDITS: 5

COURSE No.: BSC-101

DURATION EXAM.: 3 HRS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	0	100	50

**Course Outcomes:** At the end of the course the Student will be able to

- CO 1 Learn the rules of nth derivative, to find maximum and minimum value of any function, to trace the curves.
- CO 2 Understand the concept of definite integrals and find arc length, area, surface area and volume of various curves.
- CO 3 Solve the differential equations of first order and higher order.
- CO 4 differentiate the concept of scalars , vectors, gradient, divergence and curl.
- CO 5 Evaluate the complex no. in polar form and understand the idea of hyperbolic functions

## Detailed Syllabus

### UNIT - I Differential Calculus – I

(07 hrs)

Leibnitz theorem (without proof) , Partial differentiation, Euler's theorem on homogeneous functions, Asymptotes, Double points, curvature, Curve tracing in Cartesian, polar and parametric forms.

### UNIT – II Differential Calculus – II

(07 hrs)

Rolle's theorem , Mean value theorem , Taylor's and Maclaurin's series with remainder , Indeterminate forms , Taylor's series in two variables , Maxima and Minima of functions of two variables , Method of Lagrange's multiplier's.

### UNIT – III Integral Calculus

(08 hrs)

Definite integrals with important properties, differentiation under the integral sign, Gamma, Beta and error functions with simple problems, applications of definite integrals to find length, area, volume and surface area of revolutions, transformation of coordinates, double and triple integrals with simple problems.

### UNIT –IV Vector Calculus

(06 hrs)

Scalar and vector product of vectors, Derivatives of vectors, Partial derivatives of vectors, Directional derivatives and Gradient, Divergence and Curl of a vector, Vector Integration ; Gauss's Divergence theorem, Green's theorem, Stoke's theorem,

### UNIT – V Complex Trigonometry

(05 hrs)

Hyperbolic functions of a complex variable, Inverse Hyperbolic functions, Logarithmic function of a complex variable; Summation of series by C+ iS method.

### UNIT – VI Ordinary Differential Equations

(08 hrs)

Differential equations of first order and first degree: Exact and non-exact differential equations, Linear and Bernoulli's differential equations. Higher order linear differential equations: Complementary solution, particular integral and general solution of these equations, variation of parameters technique to find particular integral of second order differential equations, Cauchy's and Lagrange's differential equations. Applications of ordinary differential equations to simple Electrical and Mechanical Engg. Problems.

**BOOKS RECOMMENDED:**

- |                                   |  |
|-----------------------------------|--|
| 1. Calculus and Analytic Geometry | Thomas and Finney, 9 <sup>th</sup> Edition, Pearson, 2002. |
| 2. Differential Calculus          | S. Narayan and P.K. Mittal, S.Chand, New Delhi.            |
| 3. Vector Calculus                | S. Narayan and P.K. Mittal, S.Chand, New Delhi.            |
| 4. Higher Engineering Mathematics | B.S Grewal, Khanna Publishers, New Delhi                   |
| 5. Engineering Mathematics-I      | Dr. Bhopinder Singh  |
| 6.                                |  |

**NOTE: (I)** There shall be total seven questions. Question no.1 is compulsory and short answer/ objective type .It will consists of 10 questions each of 01 mark (Total: 10 marks)

**(II)** There will be two questions from each unit. Attempt one question from each unit. Each question carry 15 marks.



First Semester Examination to be held in the Year December 2018,2019,2020,2021

CLASS: B.E. 1ST SEMESTER

BRANCH:COMPUTER/E&C/IT ENGINEERING

COURSE TITLE: ENGINEERING PHYSICS

CREDITS: 4

COURSE No.: BSC-102

DURATION EXAM.: 3 HRS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	1	0	100	50

**Course Outcomes (CO) :** At the end of the course the Student will be able to -

- CO 1 Understand the significance of Maxwell's equations as the basis of Electromagnetic theory. Gain the knowledge on the basic concepts of Quantum Mechanics and its applications. Acquire the concepts of different types of oscillations.
- CO 2 Assimilates the basic concepts of Semiconductor Physics. Get familiar with different aspects of applied optics & their applications. Understand the working principle of various lasers and optical fibres and their applications in various fields.

### SECTION – A

#### Module -I: ELECTROMAGNETIC FIELDS AND WAVES

Concepts of Del Operator- gradient, divergence, curl and their physical significances, Displacement Current. Maxwell's equations in vacuum and non conducting medium, Electromagnetic wave propagation in free space (e.m wave equations for electric & magnetic fields for free space) & their solutions ( plane wave solution) , velocity of E.M. waves, Relation between  $E_0$  &  $B_0$  , definition of Poynting vector, Poynting theorem.

8hrs, Weightage = 20%

#### Module –II : QUANTUM MECHANICS

Inadequacies of Classical Mechanics ,De-broglie's concept of Matter waves, Wave-packet (Wavegroup), Phase and Group velocity, Heisenberg's uncertainty Principle, Experimental illustration of Uncertainty principle using single slit, Wave-function definition, interpretation and significance of wave-function, Schrodinger's wave equation ( Steady-state and Time dependent) for one- dimensional case, Concept of Operators and Expectation values, Applications of Schrodinger's equation (Time independent) to ;

- i) Particle in a one-dimensional box of infinite height, ii) Single step potential barrier, iii) Tunnel effect,

9hrs, Weightage = 20%

#### Module-III : OSCILLATIONS

Damped and Forced oscillations and their differential equations , Logarithmic decrement, Relaxation time & Quality factor,Ultrasonic waves and their production by Piezoelectric method and general applications.

4hrs, Weightage = 10%

### SECTION – B

#### Module –IV: SEMICONDUCTOR PHYSICS

Structure of Atoms, Energy Band diagram, Metal, Insulator and Semiconductor, Intrinsic and Extrinsic semiconductors , Direct & Indirect semiconductors , Bond in semiconductor & effect of temperature on semiconductors, Hole & Electron description , Charge densities in semiconductor , Generation & Recombination of charge carrier, Law of mobility & conductivity, Current densities in semiconductors , Fermi levels, Mass action law, Drift & Diffusion currents, Hall effect, Hall co-efficient & its applications .

9hrs, Weightage = 20%

## Module –V : APPLIED OPTICS

Interference in thin films (by reflection and transmission of light), Theory of Newton's rings by reflected light, Determination of wavelength and refractive index of monochromatic light by Newton's rings theory.

Fraunhofer & Fresnel's diffractions, Fresnel's half period zones and rectilinear propagation of light, Fraunhofer diffraction due to a single slit, Plane diffraction grating & its theory for secondary maxima & minima.

Unpolarised and polarised light, Double refraction phenomenon, Nicol Prism, Mathematical representation of elliptically and circularly polarized light, Quarter and Half wave plates.

No. of Lectures – 7, Weightage = 20%

## Module VI : LASERS AND FIBRE OPTICS

Principal of Laser action, Einstein's co-efficients, Ruby & Co<sub>2</sub> Lasers, Holography, Propagation of Light in Optical fibres, Acceptance angle & acceptance cone, Numerical Aperture, Single mode & Multimode fibres, Characteristics and General applications of Lasers & Optical fibres.

No. of Lectures - 5, Weightage = 10%

## TUTORIALS

S.No	TOPICS
T-1	Numerical Problems pertaining to topics in Unit-I
T-2	Numerical Problems based on topics in Unit-II
T-3	Numerical Problems related to topics in Unit-III
T-4	Numerical Problems based on topics in Unit- IV
T-5	Numerical Problems associated with topics in Unit-V
T-6	Numerical Problems related to topics in Unit-VI

**NOTE :** There shall be a total of eight questions, four from Each Section A & Section B selecting at least one question from each module. Each question carries 20 marks. Five questions will have to be attempted. Selecting at least two from each section. Use of Scientific calculator is allowed.

## Books Recommended:

<u>TITLE</u>	<u>AUTHOR</u>
1. Physics	Reisnick & Halliday
2. Fundamentals of Electricity & Magnetism	Duggal & Chabbra
3. Modern Physics	Beiser
4. Modern Physics	Blatt
5. Modern Physics	Gupta & Gupta
6. Sound	Subramaniam
7. Basic Electronics	Millman & Halkias
8. Semi conductor Physics and Devices: Basic Principles	Donald A. Neamen
9. Optics	Brijlal & Subramaniam
10. Fibre Optics	Ghatak, Tyagrajan
11. Lasers	K.R. Nambiyar
12. Modern Engineering Physics	A.S. Vasudeva

First Semester Examination to be held in the Year December 2018,2019,2020,2021

**CLASS: B.E. 1ST SEMESTER**

**BRANCH:COMPUTER/E&C/IT ENGINEERING**

**COURSE TITLE: ENGINEERING PHYSICS LAB**

**CREDITS: 1.5**

**COURSE No.: BSC-112**

**DURATION EXAM.: 3 HRS**

L	T	P	MARKS	
			THEORY	PRACTICAL
0	0	3	0	50

Course Outcomes :

At the end of the course the Student will be able to-

- CO-1 Gain knowledge about the scientific methods of measuring different physical parameters based on the concepts of Physics.
- CO-2 Develop the experimentation skills by displaying minimized measurement errors.
- CO-3 Demonstrate & improve the practical skills to use the appropriate physical concepts to obtain the solutions pertaining to different physics experiments.
- CO-4 Acquire a sense of scientific temper infused with innovation & creativity.

Experiment No.

Title of Experiment

Exp- I	To find the frequency of A.C. mains using an electrical vibrator.
Exp-II	To study the variation of magnetic field.
Exp-III	To verify the Faraday's laws.
Exp-IV	To find the co-efficient of self induction of a coil by Anderson's bridge using head phone.
Exp-V	To find the impedance of LCR circuit.
Exp-VI	To evaluate the value of Planck's constant using a photo-cell.
Exp-VII	To study the characteristics of a Solar cell.
Exp-VIII	To draw the V-I characteristics of a P-N junction diode.
Exp-IX	To study the common base/ common emitter characteristics of PNP/NPN junction transistor.
Exp-X	To study the Zener diode characteristics.
Exp-XI	To find the dispersive power of a given prism using a spectrometer.
Exp-XII	To find the wavelength of monochromatic light using Newton's rings apparatus.
Exp-XIII	To determine the wavelength of sodium light using a plane transmission grating.
Exp-XIV	To determine the specific rotation of sugar/glucose using Laurent's Half shade Polarimeter.
Exp-XV	To find the wavelength of He-Ne laser.

**NOTE : A MINIMUM OF EIGHT EXPERIMENTS IS TO BE PERFORMED COVERING THE DIVERSE ASPECTS OF ENGINEERING PHYSICS.**

**BOOKS RECOMMENDED:**

	TITLE	AUTHOR
1.	B.Sc. Practical Physics	C.L. Arora
2.	Practical Physics	Warnop & Flint
3.	Practical Physics	Chauhan & Singh (Vol. I & Vol. II)



# First Semester Examination to be held in the Year December 2018,2019,2020,2021

CLASS: B.E. 1ST SEMESTER

BRANCH:COMPUTER/ELECTRICAL/E&C/IT ENGINEERING

COURSE TITLE: COMPUTER PROGRAMMING

CREDITS: 4

COURSE No.: ESC-101

DURATION EXAM.: 3 HRS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	1	0	100	50

**Course Outcomes :** At the end of the course the student will be able to -

- CO 1 Understand, analyze and implement software development tools like algorithm, pseudo codes and flow charts.
- CO 2 Understand the use of loops and decision making statements to solve the problems.
- CO 3 Apply different operations on arrays and user-defined functions to solve real-time problems.
- CO 4 Analyze the operation of pointers, structures and unions.
- CO 5 Implement file operations in C programming for a given application.

## Detailed Syllabus

### Section-A

#### **Introduction to Programming (Flow chart/pseudocode, compilation etc.**

Evolution of programming languages, structured programming, the compilation process, object code, source code, executable code, operating systems, fundamentals of algorithms, flow charts.

#### **Introduction to C, Data Types, Constants, Variables, Expressions, Statements, Operators, Data Input and Output.**

Character set, Identifiers, Keywords, Data Types, Constant and Variables, Statements, Expressions, Operators, Precedence of operators, Input-output Assignments. **(10 hrs)**

#### **Control Statements, Storage Classes, Library Functions.**

Control structures, Decision making and Branching, Decision making & looping.

Storage Classes: Types of storage class, Scoping rules.

Standard Library Functions, advantages and use of various library functions (I/O functions, String, Character, Mathematics, Time and Date, functions) **(10 hrs)**

### Section-B

#### **Functions, Arrays, Recursion, User Defined Data Types, Structures, Unions, Passing Structure to Functions.**

User defined and standard functions, Formal and Actual arguments, Functions category, function prototypes, parameter passing, Call-by-value, Call-by-reference, Nested functions.

One dimensional Array, Multidimensional Array declaration and their applications, String Manipulation, Recursion, Passing array to a function. Declaration of structures, declaration of unions, pointer to structure & unions. **(10hrs)**

**Pointers, Operation on Pointers, Passing Pointers to Functions, Data Files – Opening, Closing, Creating Data Files**

Pointer variable and its importance, Pointer Arithmetic, passing parameters by reference, pointer to pointer, pointers to functions, Dangling pointer, dynamic memory allocation.

Console input output functions, Disk input output functions, opening closing and creating Data files.

**(10 hrs)**

NOTE: There shall be total eight questions, four from each section. Five questions will have to be attempted selecting at least two from each section. Use of calculator is allowed.

**BOOKS RECOMMENDED:**

- |  |                      |
|--|----------------------|
| 1. C How to Program, 7/e                   | - Paul J. Deitel     |
| 2. Programming With C                      | - Byron Gottfried.   |
| 3. Programming With C                      | - E. Balaguruswamy.  |
| 4. C The Complete Reference                | - Herbert Schildt.   |
| 5. Let us C                                | - Yashwant Kanitkar. |
| 6. Programming in C : A Practical Approach | - Ajay Mittal        |



# First Semester Examination to be held in the Year December 2018,2019,2020,2021

CLASS: B.E. 1ST SEMESTER

BRANCH: COMPUTER/ELECTRICAL/E&C/IT ENGINEERING

COURSE TITLE: COMPUTER PROGRAMMING LAB

CREDIT: 1

COURSE No.: ESC-111

DURATION EXAM: 3 HRS

L	T	P	MARKS	
			THEORY	PRACTICAL
0	0	2	0	50

**Laboratory Outcomes:** After Completion of this course the student will be able to –

- CO 1 Read, understand and trace the execution of programs written in C language.
- CO 2 Exercise conditional and iterative statements to write C programs.
- CO 3 Implement Programs using operators, arrays and pointers to access functions.
- CO 4 Write programs that perform operations using derived data types and files.

## Lab Experiments

**Experiment 1:** Problem solving using computers: Familiarization with programming Environment.

**Experiment 2:** Variable types and type conversions: Simple computational problems using arithmetic expressions.

**Experiment 3:** Branching and logical expressions: Problems involving if-then-else Structures.

**Experiment 4:** Loops, while and for loops: Iterative problems e.g., sum of series

**Experiment 5:** 1D Arrays: searching, sorting: 1D Array manipulation

**Experiment 6:** 2D arrays and Strings, memory structure: Matrix problems, String Operations

**Experiment 7:** Functions, call by value: Simple functions

**Experiment 8:** Recursion, structure of recursive calls: Recursive functions

**Experiment 9:** Pointers, structures and dynamic memory allocation: Pointers and Structures

**Experiment 10:** File handling: File creation, writing and reading a file, File manipulation Operations



# First Semester Examination to be held in the Year December 2018,2019,2020,2021

CLASS: B.E. 1ST SEMESTER

BRANCH:ELECTRICAL/COMPUTER/E&C/ I.T ENGINEERING

COURSE TITLE: ENGINEERING GRAPHICS

CREDITS: 2.5

COURSE No.: ESC-102

DURATION EXAM.: 3 HRS

L	T	P	MARKS	
			THEORY	SESSIONAL
1	0	3	100	50

**Course Outcomes (COs):** At the end of the course the Student will be able to-

- CO 1 Draw orthographic projections of sections.
- CO 2 Use architectural and engineering scales with accuracy.
- CO 3 Work with zeal of office practices and standards.
- CO 4 Convert sketches to engineered drawing.
- CO 5 Perform auto cad two dimensional drawing.

## SECTION A

**Engineering Curves:** Conventional lines and signs used in Engineering Drawing, Dimension and Tolerances, Printing and Lettering, Curves used in Engineering Practice: Cycloidals, Involutives, Spirals and Hellices,

**Loci-Conic section:** Terms used in conic-conic curves curved defined as Loci, Practical application of conics, Ellipse, Parabola, Hyperbola

**Projection of Planes:** Projections of a plane w.r.t. the principle planes in simple and inclined positions. Rotation method and the Auxiliary plane method. Space relation of a plane. To locate a point on a plane given its projections. Parallel relation of planes. Projection of planes inclined to different principal plane.

**Projection of Solids:** Classification and main features-Prisms and Pyramids. Projection of solids inclined to both the reference planes by (I) Rotation Method, and (II) Auxiliary plane method. Projection of solids in combination (Co-axial) in simple and inclined positions.

**Sectioning of Solids:** Object of sectioning, Types of cutting planes, True shape of section, Auxiliary views of sections of multiple co-axial solids in simple and titled conditions.

## SECTION B

**Interpenetration of Solids and Intersection of Surface:** Intersection of geometrical solids/hollow sections, Tracing of lines of intersection by line method and by section method.

**Development of Surfaces:** Classification of surfaces, Methods of development-Straight line method and Radial line method, Development of solids and hollow sections in full or part development of transition pieces. To draw projections from given development.

**Isometric Projection:** Isometric scale, Isometric axes and Isometric planes, Isometric projection of solids and simple machine blocks.

### **Overview of Computer Graphics covering:**

Listing the computer technologies that impact on graphical communication, Demonstrating knowledge of the theory of CAD software [such as: The Menu System, Toolbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line (where applicable), The Status Bar, Different methods of zoom as used in CAD, Select and erase objects.

**Orthographic Projections:** Orthographic projection of simple blocks (First & Third angles), to draw the third view from given two views. Missing lines in projection.

### **Text/ Reference Books**

1. Engineering Drawing by P.S GILL
2. Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House
3. Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education
4. Agrawal B. & Agrawal C. M. (2012), Engineering Graphics, TMH Publication
5. Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, Scitech Publishers 5.
6. (Corresponding set of) CAD Software Theory and User Manuals

**NOTE:** There shall be total eight questions, four from each section. Five questions will have to be attempted selecting at least two from each section. Use of calculator is allowed.

**First Semester Examination to be held in the Year December 2018,2019,2020,2021**

**CLASS: B.E. 1ST SEMESTER**

**BRANCH: COMPUTER/ELECTRICAL/E&C/IT ENGINEERING**

**COURSE TITLE: MENTORING & PROFESSIONAL DEVELOPMENT**

**CREDIT: Non-Credit**

**COURSE No.: NCC-101**

**L T P**

**DURATION EXAM: 3 HRS**

**0 0 2**

**Detailed Syllabus**

1. Mentoring: - Meaning and importance of mentoring, Stress management, Conflict management, Time management .Role of mentor in: mitigating stress and conflict in time management, in confidence building, in overall personality development, in developing life skills and emotional intelligence. (7)
2. Meaning and components of personality, Personality development models –Johari Window and Transactional analysis, Motivation – meaning and approaches, Leadership –meaning and style. (8)

- Note:** -
- i. There shall be a case study, viva –voce of the students by internal examiner consisting of 40 marks each.
  - ii. There will be an Internal MCQ/Objective type Questions based examination of 40 marks.
  - iii. Evaluation: Satisfactory $\geq$  40%: Unsatisfactory $<$ 40%.

**First Semester Examination to be held in the Year December 2018,2019,2020,2021**

**CLASS: B.E. 1ST SEMESTER**

**BRANCH: COMPUTER/ELECTRICAL/E&C/IT ENGINEERING**

**COURSE TITLE: ENVIRONMENTAL SCIENCES**

**CREDIT: Non-Credit**

**COURSE No.: NCC-102**

**L T P**

**DURATION EXAM: 3 HRS**

**0 0 2**

### **Detailed Syllabus**

1. **Introduction**  
Definition and scope and importance of multidisciplinary nature of environment. Need for public awareness. (2)
2. **Natural Resources**  
Natural Resources and associated problems, use and over exploitation. (2)
3. **Ecosystems**  
Concept of Ecosystem, Structure, interrelationship, producers, consumers and decomposers, biodiversity and importance. (2)
4. **Environmental Pollution**  
Definition, Causes, effects and control measures of air pollution, Water pollution, Soil pollution, Noise pollution, Thermal pollution, nuclear hazards. Solid waste Management: Causes, effects and control measure of urban and industrial wastes. Disaster Management: Floods, earthquake, cyclone and landslides. (4)
5. **Social Issues**  
Water conservation, rain water harvesting, Climate change, global warming, acid rain. Environment Protection Act: Air (Prevention and Control of Pollution) Act, Water (Prevention and control of pollution) Act, Wildlife Protection Act, Forest Conservation Act. (3)
6. **Human Population and the Environment**  
Population growth, Population explosion. Environment and human health, Human Rights. Role of Information Technology in Environment and human health. (2)

#### **Note:**

- i. There will be an Internal MCQ/Objective type Questions based examination of 40 marks.
- ii. Evaluation: Satisfactory  $\geq 40\%$ : Unsatisfactory  $< 40\%$ .
- iii. A field visit of students to make them aware about the environmental issues is compulsory.

#### **BOOKS RECOMMENDED:**

- |  |                |
|--|----------------|
| 1. Environmental Sciences                        | - Basak, A     |
| 2. Environmental Studies                         | - Benny Joseph |
| 3. Environment Pollution Control Engineering     | - Rao, C.S.    |
| 4. Perspectives in Environmental Studies         | - Kaushik, A.  |
| 5. Elements of Environment Science & Engineering | - Meenakshi.   |
| 6. Elements of Environment Engineering           | - Duggal.      |



First Semester Examination to be held in the Year December 2018,2019,2020,2021

CLASS: B.E. 1ST SEMESTER

BRANCH: COMPUTER/ELECTRICAL/E&C/IT ENGINEERING

COURSE TITLE: INDIAN CONSTITUTION

CREDIT: Non-Credit

COURSE No.: NCC-103

L T P

DURATION EXAM: 3 HRS

0 0 2

### Detailed Syllabus

1. Indian Constitution-Sources and Features, Preamble (2)
2. Fundamental Rights, Fundamental Duties (2)
3. Directive Principles of state policy (2)
4. Structure of State and Central Government (4)
5. Judiciary-Supreme court, High court, Judicial Review and Judicial Activism (5)

#### Note:

- i. There will be an Internal MCQ/Objective type Questions based examination of 40 marks.
- ii. Evaluation: Satisfactory  $\geq 40\%$ : Unsatisfactory  $< 40\%$ .



**B.E. E&C Engineering Second Semester Examination to be held in the Year  
May 2019,2020,2021,2022**

**B.E. E&C Engineering 2nd Semester**

**Contact Hrs. : 26**

COURSE CODE	COURSE TYPE	COURSE TITLE	LOAD ALLOCATIONS			MARKS DISTRIBUTION		TOTAL MARKS	CREDITS	% CHANGE
			L	T	P	INTERNAL	EXTERNAL			
BSC-201	Basic Science Course	Engineering Mathematics-II	3	2	-	50	100	150	5	100
BSC-203	Basic Science Course	Engineering Chemistry	3	1	-	50	100	150	4	100
ESC-203	Engineering Science Course	Basic Electrical Engineering	3	1	0	50	100	150	4	100
HMC-201	Humanities & Social Science & Management Courses	Communication Skill	2	-	-	25	50	75	2	100
BSC-213	Basic Science Course	Engineering Chemistry (Lab)	-	-	3	50	-	50	1.5	100
ESC-213	Engineering Science Course	Basic Electrical Engineering (Lab)	-	-	2	50	-	50	1	100
HMC-211	Humanities & Social Science & Management Courses	Communication Skill (Lab)	-	-	2	25	-	25	1	100
ESC-214	Engineering Science Course	Workshop Technology	1	-	3	50	-	50	2.5	100
<b>TOTAL</b>			<b>12</b>	<b>4</b>	<b>10</b>	<b>350</b>	<b>350</b>	<b>700</b>	<b>21</b>	



## Second Semester Examination to be held in the Year May 2019,2020,2021,2022

CLASS: B.E. 2ND SEMESTER

BRANCH: COMMON TO ALL BRANCHES

COURSE TITLE: ENGINEERING MATHEMATICS-II

CREDITS: 5

COURSE No.: BSC-201

DURATION EXAM.: 3 HRS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	0	100	50

**Course Outcomes:** At the end of the course the Student will be able to

- CO 1 Learn the rules of nth derivative, to find maximum and minimum value of any function, to trace the curves.
- CO 2 Understand the concept of definite integrals and find arc length, area, surface area and volume of various curves.
- CO 3 Solve the differential equations of first order and higher order.
- CO 4 differentiate the concept of scalars, vectors, gradient, divergence and curl.
- CO 5 Evaluate the complex no. in polar form and understand the idea of hyperbolic functions

### Detailed Syllabus

#### UNIT- I Introduction to infinite series & sequences

(06 hrs)

Convergence and divergence of a series, p-test, comparison test, Cauchy's root test, D' Alembert Ratio Test, Raabe's Test, Gauss test, Logarithmic test, Leibnitz test on alternating series.

#### UNIT- II Fourier series and Power Series Solutions of Second order O.d.e

(10 hrs)

- (i) Fourier series: Euler's formula, sufficient conditions for a Fourier expansion, functions having points of discontinuity, change of intervals. Odd and even functions, Fourier expansion of Odd and even periodic functions, half range series, typical wave forms, Parseval's formula, complex form of Fourier -series.
- (ii) Power series: Analytic function, ordinary point, singular point, regular and irregular singular points of o.d.e.  $Y'' + P(x) Y' + Q(x) Y = 0$ , Series solution of differential equations about an ordinary point, Frobenius series solution about a regular singular point. Examples of Legendre and Bessel's differential equations.

#### Unit – III First Order partial differential equations

(05 hrs)

Formation of p.d.e, First order linear p.d.e, Non-Linear p.d.e. of 1st order, solution by Charpit's method, Four Standard forms of non-linear p.d.e with reference to Charpit's technique:  $f(p, q) = 0$ ,  $f(z, p, q) = 0$ ,  $f(x, p) = g(y, q)$  and Clairaut's form.

#### Unit – IV Higher Order Linear p.d.e

(07 hrs)

Homogenous and Non-homogenous higher order linear partial differential with constant coefficients Rules for finding P.I and C.F, Non-Linear equations of 2<sup>nd</sup> order. Application of p.d.e, method of separation of variables to solve equations of vibrations of strings (or one dim wave equation), one dim heat flow equations, Laplace equations.

#### Unit – V Matrices

(08 hrs)

Introduction, Rank of matrix, Elementary transformations, Elementary matrices, Inverse using elementary transformation, Normal form of a matrix, Linear dependence and independence of vectors, consistency of linear system of equations, Gauss Jordan method, Gauss elimination method, Eigen values and Eigen vector, Properties of Eigen value, Cayley Hamilton Theorem, Reduction to diagonal form, Reduction of quadratic form to canonical form.

## Unit – VI Vector Spaces

(5 hrs)

Definition, Linear transformation, basis, dimensions of a vector space, Range and Kernel of a linear transformation, Rank, Nullity, Rank-Nullity theorem, Matrix associated with a linear transformation.

**NOTE: (I)** There shall be total seven questions. Question no.1 is compulsory and short answer/ objective type. It will consist of 10 questions each of 1 mark (Total: 10 marks)

**(II)** There will be two questions from each unit. Attempt one question from each unit. Each question carry 15 marks.

### BOOKS RECOMMENDED:

1. Advanced Engineering Mathematics
2. Higher Engineering Mathematics
3. Engineering Mathematics -II
4. Partial differential equations
5. Linear Algebra

E. Kreyszig, 2006

Dr. B.S. Grewal, Khanna Publication, New Delhi

Dr. Bhopinder Singh

M.D.RaiSinghania

D.Poole, 2<sup>nd</sup> Edition, 2005



## Second Semester Examination to be held in the Year May 2019,2020,2021,2022

CLASS: B.E. 2ND SEMESTER

BRANCH:COMPUTER/E&C/I.T ENGINEERING

COURSE TITLE: ENGINEERING CHEMISTRY

CREDITS: 4

COURSE No.: BSC-203

DURATION EXAM.: 3 HRS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	1	0	100	50

**Course Outcomes :** At the end of the course the student will be able to -

- CO 1 Know the importance of stereochemistry in organic compound and apply the knowledge gain in this course to the variety of chemical compounds.
- CO 2 Summarize the chemical structure, molecular properties, vulcanization process and application of major type of rubber.
- CO 3 The different polymerisation processes used to make thermoplastic and thermosetting plastics.
- CO 4 Through Spectroscopy, One could acquire Knowledge about the identification of newly synthesized products.
- CO 5 Explain the air quality, emission, pollution control and Environmental health.
- CO 6 Define basic knowledge on cement, its production, characteristics, properties etc.
- CO 7 Recognise the common physical, chemical process encountered in treatment process of water.

### SECTION – A

Module – I

#### STEREOCHEMISTRY AND DRUGS

Optical isomerism, enantiomerism and diastereoisomerism, racemisation, Methods for resolution of racemic mixture, asymmetric synthesis.

Definition and synthesis of a drug, structure and applications of following drugs:-

- (e) Antipyretic
- (f) Narcotics
- (g) Tranquilizers
- (h) Antibiotics

6hrs

Module – II

#### PLASTICS, RUBBER AND PAINTS

Plastics : Introduction, importance and uses of plastics, classification of plastics, moulding constituents of a plastic, moulding of plastic into articles (compression, injection, transfer and extraction mouldings).

Rubber : Introduction, types of rubber, treatment of latex, vulcanization of rubber.

Paints : Introduction, requisites of a good paint, constituents of a paint, manufacture of paint, a brief idea of manufacture, properties and uses of white pigments such as white lead and lithopone

9hrs

Module – III

**SPECTROSCOPIC TECHNIQUES AND APPLICATIONS**

UV Spectroscopy : Principle, Laws of absorption, Band nature of UV Spectrum, types of electronic transitions, applications.  
I R Spectroscopy : Principle, molecular vibrations, applications.  
NMR Spectroscopy : Principle and applications.

8hrs

**SECTION – B**

Module – IV

**ENVIRONMENTAL SCIENCE**

Concepts of Environmental Chemistry, Segments of environment (a brief idea about atmosphere, hydrosphere and Lithosphere).

Air Pollution : Types and control of Air Pollution.

Water Pollution: Classification and control of Water Pollution.

Chemical Toxicology : Biochemical effects of Pb, Hg, As, Zn & CN.

8hrs

Module – V

**ALLOYS AND CEMENT**

Alloys : Introduction, purpose of making alloys, preparation of alloys, classification of alloys (Ferrous & Non-Ferrous alloys), alloy steels and copper alloys (Brass & Bronze).

Cement & its types, manufacture of Portland cement, setting and hardening of cement.

5hrs

Module – VI

**WATER TREATMENT**

Introduction, softening of water by Lime-Soda, zeolite & ion-exchange processes, priming and foaming, sludge & scale formation, determination of hardness of water by EDTA method, Numericals on hardness and softening of water.

6hrs

**NOTE:** The paper will be divided into two sections. There shall be a total of eight questions, four from each section A and B, selecting at least one question from each module. Each question carries 20 marks. Five questions will have to be attempted, selecting at least two questions from each section. Use of calculator is allowed.

**Books Recommended:**

**S.No. BOOKS RECOMMENDED**

1. Engineering Chemistry
2. Engineering Chemistry
3. Engineering Chemistry
4. Engineering Chemistry
5. Organic Chemistry
6. Environmental Chemistry
7. Spectroscopy of Organic Compounds
8. Spectroscopy of Organic Compounds
9. Polymer Science
10. Engineering Chemistry

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## Second Semester Examination to be held in the Year May 2019,2020,2021,2022

CLASS: B.E. 2ND SEMESTER

BRANCH: COMPUTER/E&C/I.T ENGINEERING

COURSE TITLE: ENGINEERING CHEMISTRY LAB

CREDITS: 1.5

COURSE No.: BSC-213

DURATION EXAM.: 3 HRS

L	T	P	MARKS	
			THEORY	PRACTICAL
0	0	3	0	50

**Course Outcomes :** At the end of the course the student will be able to -

- CO 1 Capability to visualize and understand chemical engineering unit, operations related to fluid and practical mechanics and mass transfer.
- CO 2 To provide an overview of preparation and identification of organic compound.
- CO 3 This course relies on quantitative analysis and makes use of simple equation to illustrate the concept involved.
- CO 4 Handling different types of instruments for analysis of materials, using small quantity of material involved for quick and accurate results.
- CO 5 Estimation of total hardness of water by EDTA complex metric method.
- CO 6 Detection of various elements and functional groups in unknown organic compound.
- CO 7 To determine the alkali content in antacid tablets.

S. No.	TITLE OF EXPERIMENT
1.	Determine the percentage of $\text{CaCO}_3$ in precipitated chalk. You are provided with 1N HCl and 0.1N NaOH.
2.	To analyse the given antacid tablets.
3.	Determine Volumetrically the number of molecules of water of crystallization present in the given sample of Mohr's salt, x gms. of which have been dissolved per litre provided N/10 $\text{K}_2\text{Cr}_2\text{O}_7$ (using an external indicator).
4.	Determine Volumetrically the percentage of Cu in a sample of $\text{CuSO}_4$ crystals, Z gms of which have been dissolved per litre, provided 0.1N $\text{Na}_2\text{S}_2\text{O}_3$ .
5.	To determine the coefficient of viscosity of an unknown liquid using Ostwald Viscometer.
6.	Determine the surface tension of a unknown liquid Stalagmometer.
7.	To prepare a pure and dry sample of Aspirin.
8.	To prepare a pure and dry sample of Glucosazone.
9.	Determine the method of purification of organic compounds by column chromatography.
10.	Organic Analysis: Identify the following organic compounds (preparation of at least one derivative).
11.	Determine the total hardness of a sample of water by complexometric method (using EDTA).
12.	Determine the percentage of calcium oxide in cement.

Note:- A minimum of ten experiments to be performed.

### BOOKS RECOMMENDED:-

- | TITLE  | AUTHOR               |
|--|----------------------|
| 1. A manual of practical Engineering Chemistry | (Dr. Rajinder Kumar) |
| 2. Experimental Engineering chemistry          | (Shashi Chawla)      |

## Second Semester Examination to be held in the Year May 2019,2020,2021,2022

CLASS: B.E. 2ND SEMESTER

BRANCH: COMPUTER/E&C/ELECTRICAL/I.T ENGINEERING

COURSE TITLE: BASIC ELECTRICAL ENGINEERING

CREDITS: 4

COURSE No.: ESC-203

DURATION EXAM.: 3 HRS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	1	0	100	50

### Course Outcomes:

At the end of this course, students will demonstrate the ability

- To understand and analyse basic electric and magnetic circuits.
- To study the working principles of electrical machines.
- To introduce the components of low-voltage electrical installations.

### Section-A

#### Module 1: DC Circuits

(8 hours)

Electrical circuit elements (R, L and C), voltage and current sources, Kirchoff current and voltage laws, analysis of simple circuits with dc excitation. Mesh and Nodal analysis, Superposition, Maximum Power Transfer theorem, Thevenin and Norton Theorems.

#### Module 2: AC Circuits

(8 hours)

Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel) and resonance.

#### Module 3: Three-phase Circuits

(6 hours)

Concept of three phase voltage, voltage and current relations in star and delta connections. Measurement of power in three-phase balanced circuits.

### Section-B

#### Module 4: Transformers

(6 hours)

Principle of operation, ideal and practical transformer(no-load & on-load phasor diagrams), equivalent circuit, losses in transformers, Transformer test (open circuit & short circuit), regulation and efficiency.

#### Module 5: Electrical Machines

(8 hours)

DC Machines- Principle of operation, emf equation, torque production. AC Machines- Three-phase induction motor, principle of operation, slip and rotor frequency. Synchronous machines- Principle of operation and emf equation.

#### Module 6: Electrical Installations

(6 hours)

Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup.

### Text / References:

1. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill.
2. D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill.
3. L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press.
4. E. Hughes, "Electrical and Electronics Technology", Pearson.
5. V. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India.



**NOTE:** 1. The question paper shall comprise of total eight questions, four from each section and atleast one question from each module.

2. Students are required to attempt five questions selecting at least two questions from each section. Use of scientific calculator is allowed.

## Second Semester Examination to be held in the Year May 2019,2020,2021,2022

CLASS: B.E. 2ND SEMESTER

BRANCH: COMPUTER/E&C/ELECTRICAL/I.T ENGINEERING

COURSE TITLE: BASIC ELECTRICAL ENGINEERING LAB

CREDIT: 1

COURSE No.: ESC-213

DURATION EXAM.: 3 HRS

L	T	P	MARKS	
			THEORY	PRACTICAL
0	0	2	0	50

**Laboratory Outcomes:** The students are expected to

- Get an exposure to common electrical components and their ratings.
- Make electrical connections by wires of appropriate ratings.
- Understand the usage of common electrical measuring instruments.
- Understand the basic characteristics of transformers and electrical machines.

### List of Laboratory Experiments/Demonstrations:

1. Basic safety precautions. Introduction and use of measuring instruments – voltmeter, Ammeter, multi-meter, oscilloscope. Components-Resistors, capacitors and inductors.
2. Verification of Kirchoff's Laws.
3. Verification of Superposition Theorem.
4. Verification of Thevenin's Theorem.
5. Verification of Norton Theorem.
6. Verification of Maximum Power Transfer Theorem.
7. Measurement of current in various branches of RLC series-parallel circuit.
8. Measurement of three-phase power using Wattmeter.
9. Study of single phase transformers. Determination of Polarity Test of given single phase transformer.
10. To perform open and short circuit test on single phase transformer.
11. Demonstration of cut-out sections of machines: dc machine and ac machines.
12. Study of wires, cables, fuses and MCBs.
13. To perform calculations for energy consumption.

Note: A minimum of eight experiments is to performed by each student

• **Second Semester Examination to be held in the Year May 2019,2020,2021,2022**

**CLASS: B.E. 2ND SEMESTER**

**BRANCH: COMPUTER/ELECTRICAL/E&C/IT ENGINEERING**

**COURSE TITLE: COMMUNICATION SKILLS**

**CREDITS: 2**

**COURSE No.: HMC-201**

**DURATION EXAM: 3 HRS**

L	T	P	MARKS	
			THEORY	SESSIONAL
2	0	0	50	25

**COURSE OUTCOME OF COMMUNICATION SKILLS**

**The student would be able to:**

1. Acquire proficiency in reading, speaking and writing skills.
2. Equip themselves with grammatical and communicative competence.
3. Adept in communication skills required for the competence in present scenario.
4. Acquire proficiency in listening skills and professional etiquettes.
5. Enhance their linguistic competence for Group Discussions and public speaking.

**SECTION-A**

**UNIT I**

**Writing Practice:** Comprehension, Notices, Memos, Précis writing, Types of Letter- Enquiry letter, Reply to enquiry, Claims letter, Adjustment and sales letter, Job letter; E-mail writing.

5 hrs

**UNIT II**

**Introduction to grammar:** Use of phrase and clauses in sentences, use of proper punctuation Concept of word formation, Synonyms, Antonyms, Prefix, Suffix; Articles, Prepositions, Clichés, Subject-verb Agreement.

6 hrs

**SECTION-B**

**UNIT III**

**Communication:** Introduction, Elements of Business Communication, Media of verbal communication (oral & written), Barriers of Communication, Guidelines to improve Business communication.

5 hrs

**UNIT IV**

**Professional Etiquettes-** Meaning and types. **Listening skills:** Process of listening, types of listening, techniques to improve listening ability, skills of effective listening, **Group Discussion-** Advantages, Purpose, Group Dynamics, and Guidelines for Effective Group discussion.

5 hrs

**UNIT V**

**Speaking Skills-** Skills of Effective speaking, Components of Effective talk and body language; **Interviews-** Meaning, Types of interview, tips for giving an interview and handling questions. **Meeting skills:** purpose of meeting- procedures, notices, agenda, venue of meeting; minutes of meeting. **Brain Storming-** Purpose and techniques.

5 hrs

**NOTE:** The question paper shall consist of two questions from each unit (total 10 questions). Students have to attempt one question from each unit (total no. of questions to be attempted shall be five) i.e there shall be internal choice within each unit. Students have to attempt two questions from Section A and three questions from section B. Each question carries equal marks (10 marks).

### **BOOKS RECOMMENDED**

- Communication Skills by Dr. Nageshwar Rao & Dr. Rajendra Prasad.
- Functional Aspects of Communication Skills by Dr. Prajapati Prasad, Published by S.K Kataria & Sons.
- An Approach to Communication Skills by Indrajit Bhattacharya, Published by Dhanpat Rai & Co. Ltd.
- Communication Skills by Varinder Kumar and Bodh Raj, Published by Kalyani Publishers.
- An Approach to Communication Skills by Bhanu Ranjan
- Communication Skills and Functional Grammar by Sadhna Gupta.
- Remedial English Grammar by F.T.Wood. Macmillan
- On Writing Well. William Zinsser. Harper resource Book



## Second Semester Examination to be held in the Year May 2019,2020,2021,2022

CLASS: B.E. 2ND SEMESTER

BRANCH: COMPUTER/ELECTRICAL/E&C/IT ENGINEERING

COURSE TITLE: COMMUNICATION SKILLS

CREDIT: 1

COURSE No.: HMC-211

DURATION EXAM: 3 HRS

L	T	P	MARKS	
			THEORY	PRACTICAL
0	0	2	0	25

### COURSE OUTCOME OF COMMUNICATION SKILLS LAB

The student would be able to:

1. Identify difficult sounds, words and phrases and shall acquire proficiency in pronouncing the words correctly with proper stress and intonations.
2. Equip themselves with art of making resume/cv which can aptly highlight their self-introduction and their strongest attributes.
3. Make use of latest technology to communicate effectively in various settings and contexts.
4. Face their interviews confidently and shall acquire proficiency in Group Discussions and public speaking.
5. Acquire the art of holding meetings as well as preparing the annual reports of the organizations.

#### List of Practical:

1. Listening Comprehension.
2. Pronunciation, Intonation, Stress & Rhythm.
3. Common everyday situations and conversations & Dialogues.
4. Power point presentation
5. Resume/Bio data preparation including SWOT analysis.
6. Vocabulary improvement programs, Role play
7. Mock interviews
8. Group discussions
9. Minutes of Meeting
10. Annual Reports



## Second Semester Examination to be held in the Year December 2019,2020,2021,2022

**CLASS: B.E. 2ND SEMESTER**

**BRANCH: CIVIL/MECHANICAL ENGINEERING**

**COURSE TITLE: WORKSHOP TECHNOLOGY**

**CREDITS: 2.5**

**COURSE No.: ESC-214**

**DURATION EXAM: 3 HRS**

L	T	P	MARKS	
			THEORY	PRACTICAL
1	0	3	0	50

### Course Outcomes:-

At the end of the course, the student will be able to -

- CO 1 Understanding different manufacturing techniques and their relative Advantages/disadvantages with respect to different applications.
- CO 2 Selection of a suitable technique for meeting a specific fabrication need.
- CO 3 Acquire a minimum practical skill with respect to the different manufacturing methods and develop the confidence to design& fabricate small components for their project work and also to participate in various national and international technical competitions.
- CO 4 Introduction to different manufacturing methods in different fields of engineering.
- CO 5 Practical exposure to different fabrication techniques
- CO 6 Creation of simple components using different materials. Exposure to some of the advanced and latest manufacturing techniques being employed in the industry.

### Shop Practice :-

#### Unit I CARPENTRY:-

1. Different joints :- a) Middle/cross lap joint  
b) Mortise and Tenon T –joint
2. Pattern making of open bearing

#### Unit II CASTING:-

1. Casting of open bearing (single piece pattern)
2. Casting of split piece pattern

#### Unit III SMITHY:-

1. Cubical block from a cylindrical section
2. L – shaped hook from cylindrical section

#### Unit IV WELDING:-

1. Preparation of single V – Butt joint by gas and arc welding processes
2. Preparation of Double V-Butt joint, T-joint and corner joint by gas and arc welding

#### Unit V FITTING:-

1. Assembly of snap fitting of MS-Flat pieces (Male and Female)
2. Assembly and fitting of two L- shaped rectangular MS flat pieces

#### Unit VI MACHINE SHOP:-

1. Operation like turning, step turning on MS round
2. Operation like taper turning, Knurling on MS round
3. Introduction to CNC machines

#### Books Recommended:-

- Workshop Technology by Hajra and Chowdhary
- Manufacturing Technology Vol I & II by Rao. P.N
- Manufacturing Technology by Gowri .P. Hariharan and A. Suresh Babu

**ANNEXURE-I**

**B.E. Information Technology 3<sup>rd</sup> Semester Examination to be held in the Year  
December 2019, 2020, 2021, 2022**

**B.E Information Technology 3<sup>rd</sup> Semester****Contact Hrs: 25**

COURSE CODE	COURSE TYPE	COURSE TITLE	LOAD ALLOCATION			MARKS DISTRIBUTION		TOTAL	Credits	%Change
			L	T	P	Internal	External			
PIT-301	Professional Core Course	Computer Organization and Architecture	3	1	0	50	100	150	4	100%
PIT-302	Professional Core Course	Object Oriented Programming Using C++	3	1	0	50	100	150	4	100%
EEC- 301	Engineering Science Course	Analog Electronics	2	1	0	50	100	150	3	100%
BSC-301	Basic Science Course	Graph Theory	2	1	0	50	100	150	3	100%
HMC-301	Humanities & Social Science Course	Organization Management	2	1	0	50	100	150	3	100%
PIT-311	Professional Core Course	Object Oriented Programming Using C++ Lab	0	0	2	50	-	50	1	100%
EEC-311	Engineering Science Course	Analog Electronics Lab	0	0	2	50	-	50	1	100%
PIT-312	Professional Core Course	PC hardware Lab	0	0	2	50	-	50	1	100%
MOC-314	Massive Open Online Course	MOOC								
NCC-302	Non-Credit Course	Internet of Things	2	0	0	Satisfactory/ Un-Satisfactory			Non-Credit	
TOTAL			14	5	6	400	500	900	20	

**3rd Semester Examination to be held in the Year December 2019, 2020, 2021, 2022**

**CLASS: B. E 3<sup>RD</sup> SEMESTER**

**CREDITS: 4**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE TITLE: COMPUTER ORGANISATION**

**MARKS**

**AND ARCHITECTURE**

**COURSE NO. : PIT-301**

L	T	P	Theory	Sessional
3	1	0	100	50

**DURATION OF EXAM: 3 HOURS**

**COURSE OUTCOMES**

At the end of the course the student will be able to: -

<b>CO1</b>	Understand the basic architecture and operational concepts in designing CPU.
<b>CO2</b>	Analyze various component units ( ALU& CU) and Organization of CPU.
<b>CO3</b>	Analyze various memories management techniques like Virtual Memory and Cache Memory.
<b>CO4</b>	Apply the concepts of Parallel Processing in designing high performance processors
<b>CO5</b>	Analyze the working of different types of Processors

**Detailed Syllabus**

**Section-A**

**Introduction:** - Basic structure of Computers, stored programme concept, Basic Operational concepts, Functional Units, Machine language, concept of memory locations, addresses, addressing modes. **(6Hrs)**

**Processing and execution:** - Processing unit, execution of instructions, control step sequence, different types of instruction, ALU Design, Arithmetic Processes, Control Unit Design, Hardwired& Micro programmed Control Unit. **(6Hrs)**

**CPU:** General Register Organization, Stack Organization, Instruction format, RISC, CISC. **(4Hrs)**

**Input output organization:** - I/O Systems–Programmed Control, Interrupt controlled & DMA Data Transfer Schemes, I/O Processors. Architecture (IOP). **(6Hrs)**

**Section-B**

**Memory Management:** - Memory organization, Characteristics of memory size, Access time, Read/write cycle time, Sequential and Random access semiconductor memories, Virtual memory and its implementation, Cache memory and its types- Split and Unified, level of Caches. **(8Hrs)**

**Parallel processing** – Basic Concepts, Types of parallel Processors, Pipelined processors, Pipelined Structures, Pipeline Hazards. **(6 Hrs)**

Introduction to Vector Processors, Array Processors, Multicore processors. **(6Hrs)**

**Books Recommended:**

- |   |                               |
|---|-------------------------------|
| 1. Computer Architecture & Organization | John P. Hayes ( McGraw Hill ) |
| 2. Computer System Architecture         | Morris Mano                   |
| 3. Computer System Architecture         | V.K. Jain                     |
| 3. Computer Organization                | Carl V. Hamacher              |
| 4. Digital Electronic                   | Malvino Brown.                |

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed

**3rd Semester Examination to be held in the Year December 2019, 2020, 2021, 2022**

**CLASS: B. E 3<sup>RD</sup> SEMESTER**

**CREDITS: 4**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE TITLE: OBJECT ORIENTED**

**PROGRAMMING USING C++**

**COURSE NO: PIT-302**

**DURATION OF EXAM: 3 HOURS**

L	T	P	MARKS	
			THEORY	SESSIONAL
3	1	0	100	50

**COURSE OUTCOMES**

At the end of the course the student will be able to: -

<b>CO1</b>	Understand the difference between Structured Programming approach and Object Oriented Programming approach.
<b>CO2</b>	Acquire knowledge in developing object oriented solutions to problems by learning the usage of Data Abstraction, Encapsulation, and Inheritance.
<b>CO3</b>	Design and implement programs using Classes and Objects.
<b>CO4</b>	Understand the concept of Inheritance, Polymorphism, Operator Overloading and Function Overloading.
<b>CO5</b>	Apply the concepts of Object Oriented Programming in Templates & Exception Handling, File related operations and in real-time application development.

**Detailed Syllabus**

**Section- A**

**Review of Pointers:** Passing parameters, Array of Pointers, Character Pointers. **(2Hrs)**

**Programming Techniques:** Unstructured, Procedural, Modular. Introduction to Objects, Object & Cohesion **(3Hrs)**

**Overview of C++,** Object Oriented programming, Encapsulation, Polymorphism, Inheritance, Console I/O, C++ Comments. **(3Hrs)**

**Classes & Objects:** Metaclass, Abstract class, Public and Private variables, Constructor and Destructor Functions, Constructors taking parameters, Object Pointers, In-Line Functions, Automatic In lining, Friend Functions, This Pointer, New & Delete, Array of Objects. **(12Hrs)**

**Section- B**

**Overloading,** Overloading Constructor Functions, Operator overloading, Overloading Binary and Unary Operators, Overloading Relational & Logical Operators. **(8Hrs)**

**Inheritance,** Using Protected Members, Multiple Inheritance, Virtual Base Classes, Introduction to Virtual Functions. **(6Hrs)**

**Templates & Exception Handling:** Use of Templates, Function Templates, Class Templates, Handling Exception. **(4Hrs)**

**File Handling:** I/O Basics, Ifstream, Ofstream, Ifstream, Open(), Close(), EOF(), Binary I/O, Get(), Put(), Read(), Write(), Random Access, Seekg(), Seekp(), Tellg(), Tellp(). **(4Hrs)**

**Books Recommended:**

- |   |                            |  |
|---|----------------------------|--|
| 1 | Programming in C++         | Balaguruswamy                                |
| 2 | C++ the Complete Reference | Herbert Schildt.                             |
| 3 | Mastering C++              | K.R. Venugopal & T. Ravishankar & Raj Kumar. |
| 4 | Turbo C++                  | Robert Lafore.                               |

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed

**3rd Semester Examination to be held in the Year December 2019, 2020, 2021, 2022**

**CLASS: B. E 3<sup>RD</sup> SEMESTER**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE TITLE: ANALOG ELECTRONICS**

**COURSE NO. : EEC-301**

**DURATION OF EXAM: 3HOURS**

**CREDITS: 3**

L	T	P	MARKS	
			Theory	Sessional
2	1	0	100	50

**COURSE OUTCOMES**

At the end of the course the student will be able to: -

<b>CO1</b>	Understand the principles of semiconductor devices and their applications.
<b>CO2</b>	Understand the characteristics of transistors and perform analysis on DC and AC load line.
<b>CO3</b>	Attain basic knowledge of FETs and MOSFETs.
<b>CO4</b>	Perform analysis of single stage and multistage amplifiers.
<b>CO5</b>	Learn the basics of h- parameters.

**Detailed Syllabus**

**Section-A**

**Semiconductor Devices:** PN junction diode, Volt-ampere characteristics, diode capacitance, static and dynamic resistances, Zener diode, tunnel diode, schottky diode, photodiode, LED-their characteristics and analysis, Half wave, full wave and bridge rectifier with necessary derivations, Voltage regulation, Capacitor filter, Inductor filter, LC filter, Bleeder resistor, numerical problems. **(11 Hrs)**

**Transistors:** Transistor and its characteristics in CE,CB,CC mode, Ebers-Moll model, generalized transistor equation, Base width modulation, types of biasing circuits, operating point and loadline. **(10Hrs)**

**Section-B**

**FET:** Introduction, Construction and operation of JFET, Characteristics, JFET parameters and their relationship. MOSFET- depletion and enhancement type- characteristics and operation. **(8Hrs)**

**Amplifiers:** Principle of operation and classification of amplifiers (Single stage and multistage amplifiers) analysis and frequency response of amplifiers, multistage amplifiers- LC, RC, DC and transformer coupled **(9 Hrs)**

**Hybrid Parameters:** Introduction, Two port network, Determination of h-parameters, h-parameter equivalent circuit, hybrid model for CE, CB, CC configuration with necessary derivations. **(4Hrs)**

**BOOKS RECOMMENDED:**

- |    |                        |                 |
|----|------------------------|-----------------|
| 1. | Integrated Electronics | Millman&Halkias |
| 2. | Basic Electronics      | J.B Gupta       |
| 3. | Electronics Devices    | Bolystead       |

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

**3rd Semester Examination to be held in the Year December 2019, 2020, 2021, 2022**

**CLASS: B.E 3<sup>RD</sup> SEMESTER**

**CREDITS: 3**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE TITLE: GRAPH THEORY**

**COURSE NO.: BSC-301**

**DURATION OF EXAM: 3 HOURS**

L	T	P	MARKS	
			Theory	Sessional
2	1	0	100	50

**COURSE OUTCOMES**

At the end of the course the student will be able to: -

<b>CO1</b>	Understand and apply fundamental aspects of graph theory tools in solving practical problems
<b>CO2</b>	Evaluate the basics concepts of groups, its examples and related results.
<b>CO3</b>	Create graphs and trees using different transversal methods.
<b>CO4</b>	Improve proof of writing skills

**Detailed Syllabus**

**Section-A**

**Algebraic System**

Definition, examples and related basic theorems on Groups, Sub groups, Cosets & Normal Subgroups, Logic operators, truth tables  
**(10 Hrs)**

**Graph Theory**

Basic terminology, multi graphs and weighted graphs, connectivity; walk, trail and path, circuits & Cycles, shortest path in weighted graphs, Algorithm of shortest path, Hamiltonian and Eulerian paths and circuits, Eulerian trail & circuit, Eulerian graphs, Hamiltonian cycle, Hamiltonian graph, Konigsberg Bridge problem.  
**(12 Hrs)**

**Section-B**

**Planar Graph**

Introduction to Planar Graph, maps and region, Euler's formula. Kuratowski's graphs and Kuratowski's theorem.  
**(05Hrs)**

**Trees and Cut Sets**

Trees, Rooted Trees, path lengths in rooted trees, prefix codes binary search trees, spanning trees and cut sets and circuits.  
**(05Hrs)**

**Books Recommended:**

- |  |                           |
|--|---------------------------|
| 1. Discrete Mathematics and its Applications, Tata McGraw – Hill                                     | Kenneth H. Rosen          |
| 2. Discrete Mathematics with Applications, 4th edition, Wadsworth Publishing Co. Inc.                | Susanna S. Epp            |
| 3. Elements of Discrete Mathematics A Computer Oriented Approach, 3rd Edition by, Tata McGraw – Hill | C L Liu and D P Mohapatra |
| 4. Graph Theory  | Narsingh Deo              |

**NOTE:** There will be eight questions of 15 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

**3rd Semester Examination to be held in the Year December 2019, 2020, 2021, 2022**

**CLASS: B.E 3<sup>RD</sup> SEMESTER**

**CREDITS: 3**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE TITLE: ORGANISATION MANAGEMENT**

**COURSE NO.-HMC-301**

**DURATION OF EXAM: 3 HOURS**

L	T	P	MARKS	
			Theory	Sessional
2	1	0	100	50

**COURSE OUTCOMES**

At the end of the course the student will be able to: -

<b>CO1</b>	Understand how organizations functions
<b>CO2</b>	Understand the various behaviour of the organizations and their processes to compete in the business world.
<b>CO3</b>	Understand basic management concepts and enhance the leadership skills of the managers.
<b>CO4</b>	Understand appropriate intervention in directing employees towards achieving organisationalgoal.

**Detailed Syllabus**

**Section-A**

**Concept and Evolution of Management**

Management: Meaning, Characteristics, Functions and Scope. Classical Theory of management: Henry Fayol Administrative Management Theory and Taylor Scientific Management Theory. **(6Hrs)**

**Planning**

Characteristics, Significance and Barriers to effective PlanningProcess of Planning and its types.Steps taken to make Planning effective. **(6Hrs)**

**Decision Making**

Meaning,Characteristics, Importance & Process of Decision Making. Types of Decisions, Techniques for improving Group Decision Making.Limitations of Decision Making. **(6Hrs)**

**Section – B**

**Organizing**

Forms of Organization: - Formal and Informal. Departmentation and its bases.

Forms of organization structure: -Line, Line &Staff organization structure. **(6Hrs)**

**Directing and Leading**

Direction: - Importance and Principles of Direction. Leadership- characteristics, Functions, Importance. Styles of Leadership- Autocratic, articipative and Free – Rein. Communication: Concept, Process Types & Barriers. **(6Hrs)**

**Controlling and Coordinating**

Controlling: - Concept, Importance, Process. Types and Stages of Control. Co-ordinating: Importance. and Principles, External & Internal Co-ordination, Techniques of Effective Coordination.**(6Hrs)**

**Books Recommended:**

1. Essentials of Management
2. Principles & Practice of Management
3. Management & organization
- 4.Principles& Functions of Management
5. Organization and Management

Koontz, H &Weihrich, H., McGrawHill Int.  
Prasad, L.M.  
Allen, McGraw Hill Int.  
Jain, J.K PrateekPrak  
Agrawal, R.D.

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed

3rd Semester Examination to be held in the Year December 2019, 2020, 2021, 2022

**CLASS: B.E 3<sup>RD</sup> SEMESTER**

**CREDIT: 1**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE TITLE: OBJECT ORIENTED PROGRAMMING LAB**

**COURSE NO.: PIT-311**

**DURATION OF EXAM: 3HRS**

			MARKS
L	T	P	PRACTICAL
0	0	2	50

<b><u>COURSE OUTCOMES</u></b>	
After Completion of this course the student will be able to: -	
<b>CO1</b>	Develop solutions for a range of problems using Objects and Classes.
<b>CO2</b>	Implement the concepts of Constructors, Destructors and Operator Overloading.
<b>CO3</b>	Apply fundamental algorithmic problems including Type Casting, Inheritance.
<b>CO4</b>	Implement the concepts of Run Time Polymorphism using Virtual Functions
<b>CO5</b>	Implement the concepts of Generic Programming, Templates, File Handling using C++.

**Lab Experiments:**

Experiment 1	Design and implement programs using Pointers.
Experiment 2	Design and implement programs using Classes and Objects.
Experiment 3	Design and implement programs using Constructors and Destructors.
Experiment 4	Design and implement programs using the concepts of Inheritance.
Experiment 5	Design and implement programs using Friend Function.
Experiment 6	Design and implement programs using New and Delete operator.
Experiment 7	Design and implement programs using the concepts of Overloading.
Experiment 8	Design and implement programs using the concepts of files.

**NOTE:** Additional Lab experiments/practicals will be performed based on the course contents requirements.

**3rd Semester Examination to be held in the Year December 2019, 2020, 2021, 2022**

**CLASS: B.E 3<sup>RD</sup> SEMESTER**  
**BRANCH: INFORMATION TECHNOLOGY**  
**COURSE TITLE: ANALOG ELECTRONICS LAB**  
**COURSE NO. :EEC-311**  
**DURATION OF EXAM: 3HRS**

**CREDIT:1**

<b>L</b>	<b>T</b>	<b>P</b>	<b>MARKS</b>
<b>0</b>	<b>0</b>	<b>2</b>	<b>PRACTICAL</b>
			<b>50</b>

<u><b>COURSE OUTCOMES</b></u>	
After Completion of this course the student will be able to: -	
<b>CO1</b>	Plot forward and reverse characteristics of PN junction diode and Zener diode.
<b>CO2</b>	Fabricate half and full wave rectifiers and evaluate their performance parameters
<b>CO3</b>	Plot the characteristics of transistor for various configurations using trainer kit.
<b>CO4</b>	Plot the characteristics of FET using trainer kit.

**Lab Experiments:**

Experiment 1	Familiarization with various Electronic Components- resistors, capacitors, Transistors, diodes, IC, Transformers
Experiment 2	Diode characteristics (Forward and reverse)
Experiment 3	Diode as a Rectifier with capacitor filter(Half & Full Bridge)
Experiment 4	Zener diode characteristics & Zener diode as voltage regulator
Experiment 5	Characteristics of Tunnel Diode, LED's, photodiode.
Experiment 6	Characteristics of transistors in CB, CE & CC mode.
Experiment 7	Design of self bias circuit using BJT.
Experiment 8	Characteristics of JFET, MOSFET.
Experiment 9	Determination of h-parameters from transistor characteristics.

**NOTE:** Students should perform at least 7 out of 9 experiments.

Additional Lab experiments/practicals will be performed based on the course contents requirements.

**3rd Semester Examination to be held in the Year December 2019, 2020, 2021, 2022**

**CLASS: B.E 3<sup>RD</sup> SEMESTER**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE TITLE: PC HARDWARE AND MAINTAINANCE LAB.**

**CREDIT:1**

**COURSE NO. : PIT-312**

**DURATION OF EXAM: 3HRS**

MARKS			
L	T	P	PRACTICAL
0	0	2	50

<u>COURSE OUTCOMES</u>	
After Completion of this course the student will be able to: -	
<b>CO1</b>	Install, configure, optimize and upgrade the portable personal computer.
<b>CO2</b>	Perform routine maintenance and upgrade of the computer system.
<b>CO3</b>	Identify the existing configuration of the computers and peripherals.
<b>CO4</b>	Define input and output characteristics of different configurations of transistors.
<b>CO5</b>	Perform diagnostic procedures and troubleshooting techniques to personal computer.

**Lab Experiments:**

Experiment1	Study of keyboard- Mechanical Keyboard & Membrane Keyboards
Experiment2	Study of Printers a)Dot-Matrix Printers      b) Inkjet Printers
Experiment3	Study of SMPS
Experiment4	Assembling the Units of Computer
Experiment5	Fault finding in the various units of Computer, Fault finding Codes & Beeps.
Experiment6	Software loading at different platforms such DOS, Windows- 95/98/2000
Experiment7	Use of Antivirus Software

**NOTE:** Additional Lab experiments/practicals will be performed based on the course contents requirements.

**3rd Semester Examination to be held in the Year December 2019, 2020, 2021, 2022**

**CLASS: B.E 3<sup>RD</sup> SEMESTER**

**BRANCH: INFORMATION TECHNOLOGY**

**CREDIT: 1**

**COURSE TITLE: MooC**

**COURSE NO. : MOC-314**

MARKS			
L	T	P	PRACTICAL
0	0	2	50

**MooCs:** A massive open online course (MooC) is a model for delivering learning content to any person who wants to take a course by means of the web. It has been incorporated in the 3<sup>rd</sup> semester.

To evaluate a MooCs course following is the scheme proposed:

**Breakup of Marks:**

- **Attendance- 10 marks**  
Students will have to visit the lab twice a week as per the time table and pursue their respective online course.
- **Report file-15marks**  
A detailed report of about 20-25 pages has to be submitted to the department at the end of the semester. It should contain details about the course that was undertaken by the student. A copy of the assignments with solutions that have been uploaded on the MooC platform should also be included in the final report. A copy of the certificate if awarded should also be appended to thereport.
- **Presentation- 15 marks.**  
The presentation should be given to the peers/students focusing on the key points of the course with an aim to share the knowledge.
- **Certification- 10 marks**  
The students awarded with the certificate will be given 10 marks.(Copy to be attached in the report.)

The students can opt for a choice of MooC from the list provided hereunder: -

1. C#
2. WebDevelopment
3. Python
4. PHP
5. Android
6. Programming usingMATLAB
7. JavaScriptBasics
8. Client ServerCommunication
9. Web SecurityFundamentals
10. SQL

But not limited to this. Students can opt for a course other than in the above list after approval from the Department.

**3rd Semester Examination to be held in the Year December 2019, 2020, 2021, 2022**

**CLASS: B.E. 3<sup>RD</sup> SEMESTER**

**BRANCH: INFORMATION TECHNOLOGY**

**CREDITS: 0**

**COURSE TITLE: INTERNET OF THING**

**COURSE No: NCC-302**

L	T	P	THEORY
2	0	0	Satisfactory/Unsatisfactory

**COURSE OUTCOMES**

At the end of the course the student will be able to: -

<b>CO1</b>	Explain what Internet of Things is.
<b>CO2</b>	Describe key technologies in Internet of Things.
<b>CO3</b>	Explain resource management in the Internet of Things.
<b>CO4</b>	Understand business models for the Internet of Things.

**Detailed Syllabus**

**Unit I: Introduction**

What is the Internet of Things?: History of IoT, About IoT, Overview and Motivations, Examples of Applications, Internet of Things Definitions and Frameworks :IoT Definitions, IoT Architecture

**Unit II: Fundamental IOT Mechanisms and Key Technologies**

Identification of IoT Objects and Services, Structural Aspects of the IoT, Key IoT Technologies

**Unit III: Business Models For The Internet Of Things**

Business Models and Business Model Innovation, Business Model Scenarios for the Internet of Things.

**Unit IV: Internet of Things Application**

Smart Metering Advanced Metering Infrastructure, e-Health Body Area Networks, City Automation, Automotive Applications, Home Automation, Smart Cards

**NOTE:** This is a Mandatory Non-Credit Course. Two objective papers will be conducted internally by the department. The students are required to score at least 40% or above in totality to be considered qualified in the course.

**Books Recommended:**

- |  |  |
|--|--|
| 1. Building the Internet of Things with IPv6 and MIPv6 | Daniel Minoli                            |
| 2. Architecting the Internet of Things                 | Bernd Scholz,Reiter, Florian Michahelles |
| 3. Identity Management for Internet of Things          | Parikshit N. Mahalle&Poonam N. Railkar   |

## ANNEXURE-II

### B.E Information Technology Fourth Semester Examination to be held in the Year May 2020,2021,2022,2023

**B.E Information Technology 4<sup>th</sup> Semester**

**Contact Hrs: 28**

COURSE CODE	COURSE TYPE	COURSE TITLE	LOAD ALLOCATION			MARKS DISTRIBUTION		TOTAL	Credits	%Change
			L	T	P	Internal	External			
<b>HMC- 401</b>	Humanities & Social Sciences including Management Courses	Management Accounting And Finance	2	1	-	50	100	150	3	100%
<b>PIT-401</b>	Professional Core Course	Data Structures	3	1	-	50	100	150	4	100%
<b>PIT-402</b>	Professional Core Course	System Analysis and Design	2	1	-	50	100	150	3	100%
<b>PIT-403</b>	Professional Core Course	Operating System	3	1	-	50	100	150	4	100%
<b>PIT-404</b>	Professional Core Course	Java Programming	2	1	-	50	100	150	3	100%
<b>PIT-405</b>	Professional Core Course	Digital Electronics	2	1	-	50	100	150	3	100%
<b>PIT-411</b>	Professional Core Course	Data Structures Lab	-	-	2	50	-	50	1	100%
<b>PIT-412</b>	Professional Core Course	Operating system	-	-	2	50	-	50	1	100%
<b>PIT-413</b>	Professional Core Course	Java Programming Lab	-	-	2	50	-	50	1	100%
<b>PIT-414</b>	Professional Core Course	Digital Electronics Lab	-	-	2	50	-	50	1	100%
<b>TOTAL</b>			<b>14</b>	<b>6</b>	<b>8</b>	<b>500</b>	<b>600</b>	<b>1100</b>	<b>24</b>	

**4th Semester Examination to be held in the Year May 2020,2021,2022,2023**

**CLASS:B.E. 4<sup>TH</sup> SEMESTER**

**CREDITS: 3**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE TITLE:MANAGEMENT ACCOUNTING AND  
FINANCE**

L	T	P	MARKS	
			Theory	Sessional
2	1	0	100	50

**COURSE NO.:HMC-401**

**DURATION OF EXAM: 3 HOURS**

**COURSE OUTCOMES**

**At the end of the course the student will be able to: -**

<b>CO1</b>	Understand the concepts and techniques of accounting and finance
<b>CO2</b>	Understand ,analyzing and interpret basic tools of financial statements.
<b>CO3</b>	Enhance skills in utilizing the accounting and financial information in the process of managerial decision-making and control.
<b>CO4</b>	Gain knowledge about budget control and the concept of marginal costing.

**Detailed Syllabus**

**Section - A**

**Introduction**

Management Accounting-Meaning and Definition, Characteristics, Objectives, Scope, functions, advantages and limitation. Tools and Techniques of Management Accounting. Management Accountant: functions and duties. Financial Accounting -meaning and functions. **(8 Hrs)**

**Financial Statement Analysis**

Introduction-meaning, objective and types of financial statement. Methods of financial statement Analysis- Multistep Income statement, Horizontal analysis, Common sized analysis, Trend analysis. **(6Hrs)**

**Ratio Analysis**

Ratio Analysis- meaning and rationale, advantages and limitations. Types of ratios: Liquidity Ratios, Solvency Ratios, Profitability Ratios, Efficiency Ratios. **(6Hrs)**

**Section – B**

**Funds Flow and Cash Flow Statement**

Meaning of Fund flow statement- Uses of fund flow statement. Difference between Funds Flow Statement and Income Statement. Meaning of Cash flow statement. Difference between Cash Flow Analysis and Funds Flow Analysis. Utility of Cash Flow Analysis. Limitation of Cash Flow Analysis. **(8 Hrs)**

**Marginal Costing and Break-Even Analysis**

Definition and characteristics of Marginal costing, Marginal cost equation, Profit/Volume Ratio, Cost- Volume-Profit Analysis, Break Even Analysis- Algebraic method. **(6Hrs)**

**Budgetary Control**

Meaning, purpose and components of effective budget programme, types of budgets, Zero Base Budgeting. **(6Hrs)**

**Books Recommended:**

- |                          |                                 |
|--------------------------|---------------------------------|
| 1. Management Accounting | R.N Anthony, G.A, Walsh         |
| 2. Management Accounting | M.Y Khan, K.P Jain:             |
| 3. Management Accounting | R.K. Sharma and Shashi K. Gupta |
| 4. Financial Management  | Pandey I.M                      |

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

**4th Semester Examination to be held in the Year May 2020, 2021, 2022, 2023**

**CLASS: B.E. 4<sup>TH</sup> SEMESTER**

**CREDITS: 4**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE TITLE: DATA STRUCTURES**

**COURSE NO.: PIT-401**

**DURATION OF EXAM: 3 HOURS**

L	T	P	MARKS	
			Theory	Sessional
3	1	0	100	50

**COURSE OUTCOMES**

At the end of the course the student will be able to: -

<b>CO1</b>	For a given algorithm student will be able to analyze the algorithm to determine its Time and Space Complexity and to understand its relationship with Data Structures.
<b>CO2</b>	To understand basic concepts about Stacks, Queues, Lists, Trees and Graphs
<b>CO3</b>	To enable them to write algorithms for solving problems with the help of various fundamental Data Structures.
<b>CO4</b>	To understand and use different sorting and searching techniques and compare their performance in terms of Space and Time complexity

**Detailed Syllabus**

**Section- A**

**Introduction to data structures:** - Concepts of data and algorithm, Relation between Data Structure & Algorithm, Introduction to Time & Space complexity, Data types, Data Structures & Abstract data types, Representation of Arrays, Sparse matrices. **(2Hrs)**

**Stacks and Queues:** - Concept of Stacks, Operation on Stacks, Multiple stacks, Application of stacks in Infix, Postfix, Prefix, Recursion, Concept of Queues, Operation on Queues, Multiple Queues, Priority Queues, Circular Queues. **(10Hrs)**

**Linked Lists:** - Insertion, Deletion and Traversal on Linear Linked Lists, Doubly Linked List, Circular Linked List, Linked List as Data Structure, Header nodes, Stacks & Queues using linked list, Dynamic memory management, Garbage Collection **(10Hrs)**

**Section-B**

**Trees:** -Binary trees and its representation using Linked list, Operations on Binary Trees, Traversal Algorithms, Applications, Threaded Binary Trees and its Traversal algorithms, Heterogeneous Binary Trees, List representation using Binary Trees, Optimum Search Trees, AVL trees. **(10Hr)**

**Graphs:** -Representation of Graphs, Traversal methods, Applications Undirected Graphs, Directed Graph & their Traversal, Depth first, Breadth First, Shortest Path algorithms (Dijkstra and Floyd), Minimum Cost Spanning tree (Prim and Kruskal). **(8Hrs)**

**Sorting & Searching: -**

1. Exchange Sort (Bubble, Quicksort)
2. Selection & Tree Sorting.
3. Insertion sort, Shell Sort, Address Calculation Sort
4. Merge & Radix Sort.
5. Sequential Searching, searching an Ordered Table, Index sequential search, Binary search, Interpolation search, Tree searching **(5Hrs)**

**Books Recommended:**

- |                                      |                                |
|--------------------------------------|--------------------------------|
| 1 Data Structure using C             | Tenenbaum, Langsam, Augenstein |
| 2 Fundamentals of data structures    | Horowitz E. and Sahni S.       |
| 3 Data structures and Program Design | Robert L. Kruse.               |
| 4 Data Structures & Algorithm        | Aho, Hopcraft and Ullman.      |
| 5 Data Structure with Applications   | Sorenson.                      |

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

**4th Semester Examination to be held in the Year May 2020, 2021, 2022, 2023**

**CLASS: B.E. 4<sup>TH</sup> SEMESTER**

**CREDITS: 3**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE TITLE: SYSTEM ANALYSIS AND DESIGN**

**COURSE NO. : PIT-402**

**DURATION OF EXAM: 3 HOURS**

L	T	P	MARKS	
			Theory	Sessional
2	1	0	100	50

**COURSE OUTCOMES**

**At the end of the course the student will be able to: -**

<b>CO1</b>	Understand the system development life cycle
<b>CO2</b>	Understand various tools of structured design
<b>CO3</b>	Analyse System Threats and disaster recovery
<b>CO4</b>	Understand quality assurance and system control

**Detailed Syllabus**

**Section – A**

**Systems concept:** Definition, Characteristics, Elements and Types of system, System Development life cycle. Role of System Analyst. **(06 Hrs)**

**System Analysis:** System planning and initial investigation, information gathering tools, Feasibility Study and its importance, Cost Benefit Analysis. **(06 Hrs)**

**System Design:** Introduction, Methodology, Tools for structured design- Data Flow Diagrams, Flowcharts, Structure Charts, Decision Tree, Decision Table, Structured English, Data Dictionary. **(08 Hrs)**

**Section-B**

**System Testing:** Test Plan, Activity network for system testing. Documentation Tools used in SDLC **(06 Hrs)**

**System Security:** Introduction, Threats to System, Control Measures, Disaster Recovery, Audit Trails, Risk Management **(08 Hrs)**

**Case study of the following systems:**

Library Management System, University Management System. **(06 Hrs)**

**Books Recommended:**

- |  |                                  |
|--|----------------------------------|
| 1. Elements of System Analysis               | Marvin Gore and John W. Stubbe.  |
| 2. System Analysis and Design                | Thapliyal M.P                    |
| 3. Modern Systems Analysis & Design          | Hoffer, George and Valacich      |
| 4. SSAD: System Software Analysis and Design | Mehta Subhash and Bangia Ramesh. |

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

**4th Semester Examination to be held in the Year May 2020, 2021, 2022, 2023**

**CLASS: B. E 4<sup>TH</sup> SEMESTER**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE TITLE: OPERATING SYSTEM**

**COURSE NO.:PIT-403**

**DURATION OF EXAM: 3 HOURS**

**CREDITS:4**

L	T	P	MARKS	
			Theory	Sessional
3	1	0	100	50

**COURSE OUTCOMES**

**At the end of the course the student will be able to: -**

<b>CO1</b>	Understand operating system structure
<b>CO2</b>	Analyze the various process scheduling schemes
<b>CO3</b>	Understand the concept of deadlock
<b>CO4</b>	Compare Various Memory Management Schemes
<b>CO5</b>	Understand system threats and need of security

**Detailed Syllabus**

**Section-A**

**Introduction** Operating System- objectives, functions, services and components.The Evolution of Operating Systems, - Batch,Interactive, time-sharing and real time systems.Concepts of Multitasking, multiprogramming, buffering, spooling.

**(3 Hrs)**

**Operating System Structure** System components, operating system service, System structure.

**(3 Hrs)**

**Concurrent Processes** Concept of a Process, Inter processes Communication, Process generation, Process scheduling. Principles of concurrency. The Producer/consumer problem, The critical section problem,Semaphores, Classical problems in concurrency.

**(6 Hrs)**

**CPU Scheduling** Scheduling concepts, Performance Criteria, Scheduling algorithms, Algorithm Evaluation, Multiprocessor scheduling.

**(5 Hrs)**

**DeadLocks** System model, Deadlock Characterization.Prevention, avoidance and detection. Recovery from deadlock, Combined approach.

**(5Hrs)**

**Section-B**

**Memory Management**

Base machine, Resident Monitor, Multiprogramming with fixed partitions.Multiprogramming with variable partitions.

Multiple Base Registers. Paging,Segmentation,Page segmentation, Virtual Memory concept, Demand

Paging,Performance, Page Replacement algorithms, Allocation of frames, Thrashing, Cache memory organization impact on performance.

**(10Hrs)**

**I/O Management & Disk Scheduling**

I/O Devices and the organization of I/O function, I/O Buffering, Disk I/O Operating System Design Issues.

**(4Hrs)**

**File System**

File Concept-File organization and Access mechanism, File Directories, File Sharing, Implementation issues.

**(3Hrs)**

**Protection & security**

Introduction to security,Protection- Goals of protection,Domain of protection,Access& rights.Security & threats-the .problems of security, authentication, program threats, System threats, Threat monitoring.

**(3Hrs)**

**Books Recommended:**

- |    |  |                                    |
|----|--|------------------------------------|
| 1. | Operating System: Concept & Design       | Milenkovic M                       |
| 2. | Operating System Design & Implementation | Tanenbaum, A.S.                    |
| 3. | Operating System Concepts                | Silbersehatz A. and Peterson, J.L. |
| 4. | Operating Systems                        | Stalling, Willam                   |
| 5. | An Introduction to operating Systems     | Dietel, H.N.                       |

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

**4th Semester Examination to be held in the Year May 2020, 2021, 2022, 2023**

**CLASS: B.E. 4<sup>TH</sup> SEMESTER**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE TITLE: JAVAPROGRAMMING**

**COURSE NO. : PIT-404**

**DURATION OF EXAM: 3 HOURS**

**CREDITS: 3**

**L T P**

**MARKS**

**2 1 0**

**Theory  
100**

**Sessional  
50**

**COURSE OUTCOMES**

At the end of the course the student will be able to: -

<b>CO1</b>	Understand the concepts of Object-Oriented Programming paradigm and platform portability in Java.
<b>CO2</b>	Apply concepts of Classes, Objects and Methods to tackle real world problems.
<b>CO3</b>	Analyze errors and exceptions by using Exception Handling mechanism.
<b>CO4</b>	Examine the Multithreading techniques by extending Thread class and develop interface, Applets and Web pages
<b>CO5</b>	Create Graphic User Interface using Abstract Window Toolkit

**Detailed Syllabus**

**Section – A**

**Java Evolution, And Overview of Java Language:** Java History–Features of java, how java different from C and C++, Java and World Wide Web, Web Browser. Java Environment: Java Development kit (JDK), Application Programming Interface (API). Java Programming Structure, Java Tokens, Constants, Variables, Expressions, Decision Making Statements and Looping, Java Statements, Overview of Arrays and Strings, Machine Neutral, Java Virtual Machine (JVM), Command Line Arguments. **(6Hrs)**

**Arrays and Strings:** Arrays, One-Dimensional arrays, Creating an Array, declaration of arrays, initialization of arrays, Two-Dimensional arrays, String arrays, String methods, String Buffer class, Vectors, Wrapper classes. **(4Hrs)**

**Classes, Objects and Methods:** Introduction, defining a class, creating objects, accessing class members, constructors, methods overloading, static members. **(4Hrs)**

**Inheritance:** Defining a sub class, sub class constructor, multilevel variables, Final classes, and Finalize methods, Abstract methods and classes, visibility control. **(4 Hrs)**

**Managing Errors and Exceptions:** Introduction, Types of Errors-Compile time and Run time errors, Exceptions, Types of Exceptions, Syntax of Exception handling code, Multiple catch statements, using finally statement, Throwing our own exceptions. **(4 Hrs)**

**Section- B**

**Multithreaded Programming:** Introduction to threads, Creating Threads, Extending the Thread Class, Implementing the Runnable interface, life cycle of a thread, priority of a thread, synchronization, Deadlock. **(6Hrs)**

**Interfaces and Applet Programming:** Introduction, defining interfaces, extending interfaces, implementing interfaces. Introduction, how applet differ from applications, building applet code, applet life cycle, About HTML, designing a web page, passing parameters to applets, getting input from the User. **(6Hrs)**

**Graphics Programming:** Introduction, the Abstract Windowing Toolkit (AWT), frames, event-driven programming, layout managers, panels, canvasses, drawing geometric figures. Creating User Interface: Introduction, describe various user interface Components: button, label, text field, text area, choice, list, check box checkbox group. **(8Hrs)**

**Books Recommended:**

- 1 Programming with JAVA
- 2 An Introduction to JAVA Programming
- 3 The Complete Reference JAVA 2

Balagurusamy TMH

Y. Daniel Liang TMH

Herbert Schildt TMH

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed

## 4th Semester Examination to be held in the Year May 2020, 2021, 2022, 2023

**CLASS: B.E. 4<sup>TH</sup> SEMESTER**

**CREDITS: 3**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE TITLE: DIGITAL ELECTRONICS**

**COURSE NO. : PIT-405**

**DURATION OF EXAM: 3 HOURS**

L	T	P	MARKS	
			THEORY	SESSIONAL
2	1	0	100	50

### **COURSE OUTCOMES**

At the end of the course the student will be able to: -

<b>CO1</b>	Understand the basics of number systems, logic Gates, Boolean laws & theorems.
<b>CO2</b>	Apply methods to simplify the Boolean functions to the minimum number of literals.
<b>CO3</b>	Design different types of combinational logic circuits using Logic gates.
<b>CO4</b>	Implement different types of sequential logic circuits using Flip Flops.
<b>CO5</b>	Construct different types of Counters and registers.

### **Detailed Syllabus**

#### **Section A**

#### **Digital Systems and Binary Numbers**

Binary numbers, Number –Base Conversions, Arithmetic operations using number system, Data Representation - fixed and floating, Complements (1's and 2's), Binary codes – weighted/non-weighted codes, BCD codes, Excess- 3-code, Grey codes, Conversion between codes, Code convertors Codes for error detection and correction (Hamming code).  
(12Hrs)

#### **Boolean algebra and Logic Simplification:**

Boolean Algebra, Logical gates, Simplification of Boolean function using Boolean algebra, Karnaugh map (up to five variables), QuineMcclusky Methods, Combinational Logic design -Half and Full adders, Half and full Subtractor, BCD Adder, Comparators.  
(11Hrs)

#### **Section- B**

**Combinational circuits:** Decoders, Encoders, Multiplexers, De-Multiplexers, Programmed logic devices– Read only memory, Programmable Read only Memories (PROM) and Programmable Logic Arrays (PLA), Programmable Array Logic(PAL).  
(10Hrs)

**Sequential logic design:** Latches and Flip flops, conversion between flip flops, Shift Registers, Analysis of synchronous and asynchronous counters, Design of Sequential logic circuits, State Reduction and Assignment, ASM Charts.  
(10Hrs)

#### **Books Recommended:**

1	Digital Design	Morris Mano
2	Digital Electronics	R.P Jain
3	Digital Logic Design	J.P. Hayes
4	Digital Logic Design	Brain Holdsworth
5	Digital Electronics & Circuits Design	Thomas Mac calla
6	Digital Electronics	R.K Gour

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

**4th Semester Examination to be held in the Year May 2020, 2021, 2022, 2023**

**CLASS: B.E. 4<sup>TH</sup> SEMESTER**

**CREDIT: 1**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE TITLE: DATA STRUCTURES LAB**

**COURSE NO. :PIT-411**

**MARKS**

L	T	P	PRACTICAL
0	0	2	50

**COURSE OUTCOMES**

After Completion of this course the student will be able to: -

<b>CO1</b>	Implement basic operations on Stacks, Queues, Linked list, Trees and Graphs
<b>CO2</b>	Able to use various Data Structures in Problem Solving.
<b>CO3</b>	Implement various sorting and searching techniques.

**Lab Experiments:**

Experiment 1	Write a program to check if expression is correctly parenthesized
Experiment 2	Write a program to evaluate Postfix Expression
Experiment 3	Write a program to convert Infix Expression to its corresponding Postfix and Prefix
Experiment 4	Write a program to convert Prefix Expression to Postfix
Experiment 5	Write a program to implement Circular Queue Operations
Experiment 6	Write a program to implement Priority Queue Operations
Experiment 7	Write a program to implement Ordered Linked List
Experiment 8	Write a program to add Polynomials using Single Linked List
Experiment 9	Write a program to implement operations on Doubly Linked List
Experiment 10	Write a program to find the duplicate numbers in a given list using Binary Tree
Experiment 11	Write a program to Sort a list of numbers using Binary Search Tree
Experiment 12	Write a program to implement operations on Threaded Binary Trees
Experiment 13	Write a program to implement Quick Sort algorithm
Experiment 14	Write a program to implement Shell Sort algorithm
Experiment 15	Write a program to implement Merge Sort algorithm

**NOTE:** Additional Lab experiments/practicals will be performed based on the course contents requirements.

**4th Semester Examination to be held in the Year May 2020, 2021, 2022, 2023**

**CLASS: B.E 4<sup>TH</sup> SEMESTER**  
**BRANCH: INFORMATION TECHNOLOGY**  
**COURSE TITLE: OPERATING SYSTEM LAB**  
**COURSE NO. : PIT-412**

**CREDIT: 1**

	<b>MARKS</b>			
	<b>L</b>	<b>T</b>	<b>P</b>	<b>PRACTICAL</b>
	<b>0</b>	<b>0</b>	<b>2</b>	<b>50</b>

**COURSE OUTCOMES**

**After Completion of this course the student will be able to: -**

<b>CO1</b>	Implement scheduling algorithms SJF, FIFS, ROUND ROBIN
<b>CO2</b>	Implement paging and segmentation
<b>CO3</b>	Implement banker's algorithm for deadlock evidence

**Lab Experiments:**

Do using Assembly/C Programming

Experiment 1	Scheduling Algorithm
Experiment2	First come first serve (FIFS)
Experiment3	Shortest job first (SJF)
Experiment4	Round Robin scheduling
Experiment5	First Fit Memory Management Technique
Experiment6	Best-Fit
Experiment7	Banker's Algorithm for Deadlock Evidence
Experiment8	Paging
Experiment9	Segmentation
Experiment10	Disk Scheduling Algorithm

**NOTE:** Additional Lab experiments/practicals will be performed based on the course contents requirements.

**4<sup>th</sup> Semester Examination to be held in the Year May 2020,2021,2022,2023**

**CLASS: B.E. 4<sup>TH</sup> SEMESTER**  
**BRANCH: INFORMATION TECHNOLOGY**  
**COURSE TITLE: JAVA PROGRAMMING LAB.**  
**COURSE NO. :PIT-413**

**CREDIT: 1**

MARKS			
L	T	P	PRACTICAL
0	0	2	50

<b><u>COURSE OUTCOMES</u></b>	
<b>After Completion of this course the student will be able to: -</b>	
<b>CO1</b>	Understand various Java Tokens, Constants, Variables, Expressions, Decision Making and Looping Statements in java.
<b>CO2</b>	Implement the concepts for creating Arrays and Strings objects in java.
<b>CO3</b>	Implement the concept of constructor, Destructor, Static member's method overloading and multithreading in java.
<b>CO4</b>	Manage Errors and Exceptions using Exception handling mechanism and code to implement interfaces and applets.
<b>CO5</b>	Design window frame using various GUI components like Buttons, Text fields, menu, check list and check boxes.

**Lab Experiments:**

Experiment 1	WAP To use different arithmetic operation in java.
Experiment2	WAP To demonstrate wrapper class in java.
Experiment3	WAP to perform manipulation on strings in java.
Experiment4	WAP to demonstrate single inheritance in java.
Experiment5	WAP to demonstrate multiple inheritance using interface in java
Experiment6	WAP to demonstrate Exception handling in java
Experiment7	WAP to check whether the entered amount is sufficient or not ,if not raise an exception in java
Experiment8	WAP to demonstrate threads in java.
Experiment9	WAP to demonstrate APPLET in java.
Experiment10	WAP to demonstrate event handling in java.

**NOTE:** Additional Lab experiments/practicals will be performed based on the course contents requirements.

**4<sup>th</sup>Semester Examination to be held in the Year May 2020,2021,2022,2023**

**CLASS: B.E. 4TH SEMESTER**

**CREDIT: 1**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE TITLE: DIGITAL ELECTRONICS LAB.**

**COURSE NO. :PIT-414**

MARKS			
L	T	P	PRACTICAL
0	0	2	50

**COURSE OUTCOMES**

**After Completion of this course the student will be able to: -**

<b>CO1</b>	Implement logic gates and realization of OR, AND, NOT AND XOR Functions using universal gates.
<b>CO2</b>	Design and implement combinational circuits like half adder/full adder, half subtractor/full subtraction, code converters, comparators, MUX/DEMUX.
<b>CO3</b>	Design and implement sequential circuits like flip-flops, counters and shift registers.

**Lab Experiments:**

Experiment 1	Verification of truth table of basic gates.
Experiment2	Verification of truth tables of ADDER/SUBTRACTER using IC-7483
Experiment3	Verification of truth tables of MULTIPLEXER/DEMULTIPLEXER
Experiment4	Verification of truth tables of BCD –7- Segment Display
Experiment5	Verification of truth tables of Code Conversion.
Experiment6	Design of Flip-Flops using IC chips
Experiment7	Design of Two's complement circuits using shift registers
Experiment8	Design and Implementation of Asynchronous MOD-12 counters.
Experiment9	Design of a sequential circuit
Experiment10	Study of PLA'S and PAL's.

**NOTE:** Each student has to perform at least 8 experiments out of which 40% shall be simulation based. Additional Lab experiments/practicals will be performed based on the course contents requirements

## ANNEXURE-I

### UNIVERSITY OF JAMMU, JAMMU COURSE SCHEME

#### B.E 5<sup>th</sup> Semester Information Technology

For Examination to be held in the Year December 2020,2021,2022,2023

Contact Hrs/Week: 22

COURSE CODE	COURSE TYPE	COURSE TITLE	LOAD ALLOCATION			MARKS DISTRIBUTION		TOTAL	Credits	%Change
			L	T	P	Internal	External			
PIT-501	Professional Core Course	Computer Networks	2	1	0	50	100	150	3	100%
PIT-502	Professional Core Course	RDBMS	3	1	0	50	100	150	4	100%
PIT-503	Professional Core Course	Microprocessor & Interfacing	2	1	0	50	100	150	3	100%
PIT-504	Professional Core Course	Theory of Computation	3	1	0	50	100	150	4	100%
MOC-505	Massive Open Online course	SWAYAM /NPTEL	3	0	0	100	-	100	3	100%
PIT-511	Professional Core Course	Computer Networks Lab	0	0	2	50	-	50	1	100%
PIT-512	Professional Core Course	RDBMS Lab	0	0	2	50	-	50	1	100%
PIT-513	Professional Core Course	Microprocessor Lab	0	0	2	50	-	50	1	100%
PIT-505	Summer Industry Internship	Industrial Training	-	-	-	50	-	50	2	100%
TOTAL			13	4	6	500	400	900	22	

**\*Note:** The Department shall offer the SWAYAM/NPTEL course out of the list of the courses offered by SWAYAM around the time of commencement of the semester. However the selected NPTEL course should not be similar to the regular courses offered as a part of the department curriculum.

## Examination to be held in the Year December 2020,2021,2022,2023

CLASS: B.E. 5<sup>th</sup> SEMESTER

CREDITS: 3

BRANCH: INFORMATION TECHNOLOGY

Marks

COURSE NO: PIT-501

L	T	P	Theory	Sessional
2	1	0	100	50

COURSE TITLE: COMPUTER NETWORKS

DURATION OF EXAM: 3 HOURS

### COURSE OUTCOMES

At the end of the course the student will be able to: -

CO1	Acquire a thorough understanding of the state-of-the-art in modern network architecture, protocols, networked systems and applications.
CO2	Familiar with the components required to build different types of networks and be exposed to the required functionality at each layer.
CO3	Analyse simple protocols and independently study literature concerning computer networks.
CO4	Propose the solutions to improve the end to end performance of the network.
CO5	Use concepts of networking in developing networks for real time engineering and scientific situations.

### Section- A

**Introduction:** Data Communication-communication system, synchronous and asynchronous systems, serial and parallel systems, dataflow-simplex, half-duplex, full-duplex, computer network-uses of computer network, categories of computer networks, protocol and standards, Reference Model-OSI and TCP/IP reference model, their comparison and critique, Network Topologies (05 hours)

**Physical Layer:** Data Transmission-Digital to Digital Conversion-Line Coding Scheme, Transmission Media, RS-232 Interface, Switching mechanisms and Comparison –circuit, packet, message, Modem and its types. (06 hours)

**Data Link Layer:** Design Issues, Error Detection and Correction, Flow Control-Elementary of data-link protocol, Sliding Window Protocol, Example of Data Link Protocol (HDLC). (06 hours)

**Medium Access Control Sub layer:** Channel Allocation Problems, Multiple Access Protocol-ALOHA, Carrier Sense Multiple Access Protocols, Collision Free Protocols, IEEE standards-802.3, 802.4, 802.5. (06 hours)

### Section- B

**Network Layer** - Design Issues, Routing Algorithms- The optimality principle, shortest path algorithm, flooding, distance vector routing, link state routing and hierarchical routing, Congestion Control- principles prevention policies, congestion control in virtual circuit subnet and datagram subnets, Traffic shaping algorithm - leaky bucket algorithm, token bucket algorithm, QOS, IP protocol, IP addresses, Internet Multicasting, Introduction to IPV6 ,IPV4 vs. IPV6, Internetworking devices –Repeaters, Hub, Bridges, Switches, Routers, Gateways. (10 hours)

**Transport Layer:** Transport Layer Services, Primitives, Issues, and elements of transport protocol, Introduction to TCP and UDP (04hours)

**Session and Presentation Layer-** Design issues, services and primitive (04 hours)

**Application Layer:** FTP, DNS, E-Mail, Firewalls. (04 hours)

### **BOOKS RECOMMENDED:**

- |   |   |                        |
|---|---|------------------------|
| 1 | Data Communication                        | - William L. Schweber. |
| 2 | Computer Networks                         | - Andrew S. Tanenbaum. |
| 3 | Communication Network System for Computer | - Davies &Barbq        |
| 4 | Data Communication and networking         | - Behrouz A. Forouzan  |

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

## Examination to be held in the Year December 2020,2021,2022,2023

CLASS: B.E. 5<sup>th</sup> SEMESTER

CREDITS: 4

BRANCH: INFORMATION TECHNOLOGY

COURSE NO: PIT-502

COURSE TITLE: RDBMS

DURATION OF EXAM: 3 HOURS

L	T	P	Marks	
			Theory	Sessional
3	1	0	100	50

### COURSE OUTCOMES

At the end of the course the student will be able to: -

CO1	Understanding Functional Components of DBMS.
CO2	Develop ER Model.
CO3	Design Queries using Relational Algebra, Relational Calculus & SQL
CO4	Design Database Schema.
CO5	Understand transaction processing, Concurrency control & Recovery Techniques

### Detailed Syllabus

#### Section - A

**Basic Concepts:** - Data Modelling-Records and Files-Abstraction and data Integration-Views-Data independence- Components of DBMS-Advantages and disadvantages, Data associations, Data model's classification. **(4 hours)**

**Entity Relationship Model:** -Basic Concepts, constraints, Design issues, Entity-relationship diagram, weak Entity sets, Extended ER features, design of ER database scheme, Reduction of ER schemes to tables. **(6 hours)**

**Relational Model:** - Attributes and domains, Tuples, Relations and schemas, relation representation, keys, Integrity rules, Relational algebra, Relational Calculus. Data Manipulation using SQL. **(6 hours)**

**Relational Data-base Design:** - Normalization using functional dependency, Normalization using join dependencies, Normalization using join dependencies, Domain key normal form. **(6 hours)**

#### Section- B

##### Section- B

**Transactions:** - Transaction concepts, transaction state, implementation of Atomicity and Durability, Concurrent execution, Serializability, Recoverability, implementation of isolation, transaction definition in SQL. **(6 hours)**

**Concurrency Control:** - Lock based protocols, Timestamp based protocols, Validation based protocols, Multiple Granularity, Multiversion Schemes, Deadlock Handling, Insert and Delete operations. **(12 hours)**

**Recovery Systems:** -Failure classification, Storage Structure, Recovery and Atomicity, Log Based Recovery, Shadow Paging, Recovery with Concurrent Transactions, Buffer Management. **(6hours)**

##### **BOOKS RECOMMENDED:**

- |  |                       |
|--|-----------------------|
| 1. Database concepts                       | Korth,Silberchatz–TMH |
| 2. An Introduction to Database Systems     | Bipin C. Desai        |
| 3.Principles of Database Management system | Aho Ullman            |
| 4. Oracle                                  | Ivan Bayross.         |

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

## Examination to be held in the Year December 2020,2021,2022,2023

CLASS: B.E. 5<sup>th</sup> SEMESTER

CREDITS: 3

BRANCH: INFORMATION TECHNOLOGY

COURSE NO: PIT-503

COURSE TITLE: MICROPROCESSOR & INTERFACING

DURATION OF EXAM: 3 HOURS

Marks

L	T	P	Theory	Sessional
2	1	0	100	50

### COURSE OUTCOMES

At the end of the course the student will be able to: -

CO1	To understand the knowledge of general architecture of a microcomputer system and architecture & organization of 8085 and 8086 microprocessors.
CO2	To classify and apply the instruction set of 8085 and 8086 microprocessor and distinguish the use of different instructions.
CO3	To analyze architecture and operation of Programmable Interface Devices and realize the assembly language programming.
CO4	To create the interfacing of memory and various I/O devices with 8085 microprocessor.

### Detailed Syllabus

#### Section- A

**Architecture of 8085:** Block diagram, Pin Description of 8085, Instruction Set and Instruction Format, Addressing Modes, Looping, Counting and Indexing. 8085 Interrupts. Interrupt handling in 8085, Enabling, disabling and masking of interrupts. **(10 hours)**

Counters and Time Delay Programs, Stack and Subroutines, Conditional Call and Return Instructions & Code Conversions, Timing diagram for different machine cycles. **(4 hours)**

**Parallel Input/Output & Interfacing:** - Basic Interfacing Concepts, Interfacing memory and I/O devices, addressing memory, interfacing a keyboard, Interfacing LED and seven segment displays. **(6 hours)**

#### Section- B

**Programmable Interface Devices:** - Basics of Programmable I/O, General Purpose Programmable Peripheral Devices – 8255A, 8259A, Direct Memory Access Controller – 8237. **(8 hours)**

**Architecture of 8086:** Memory Address space and data organization, segment registers and memory segmentation, generating memory addresses, IO address space, addressing modes, Minimum mode and Maximum mode, system timing, Instruction Set and Programming Structure of 8086. **(12 hours)**

#### **BOOKS RECOMMENDED:**

- |  |                      |
|--|----------------------|
| 1. Microprocessor Architecture, Programming and Applications with 8085 | - Ramesh S. Gaonkar. |
| 2. Microprocessor and Interfacing                                      | - Douglas V. Hall    |
| 3. Introduction to Microprocessors                                     | - Aditya Mathur      |

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

**Examination to be held in the Year December 2020,2021,2022,2023**

**CLASS: B.E. 5<sup>th</sup> SEMESTER**

**CREDITS: 4**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE NO: PIT-504**

**COURSE TITLE: THEORY OF COMPUTATION**

**DURATION OF EXAM: 3 HOURS**

Marks				
L	T	P	Theory	Sessional
3	1	0	100	50

**COURSE OUTCOMES**

**At the end of the course the student will be able to: -**

<b>CO1</b>	To Gain the knowledge of basic concepts of formal languages and finite automata techniques
<b>CO2</b>	Understand regular expressions and various problems to minimize FA
<b>CO3</b>	Apply various languages to construct context free grammar.
<b>CO4</b>	Evaluate problems relating to Push down automata and Turing Machines.

**Detailed Syllabus**

**Section- A**

**Introduction:** -Symbols, string Concatenation, alphabet, Language, Tree, Mathematical Induction Proofs, States, Transition Tables, Finite Automata, Regular Expressions, Push- down Automata, Turing Machine, Context Free grammars.  
**(8 hours)**

**Finite Automata:** - Deterministic Finite Automata (DFA), Designing, Non- deterministic finite Automata (NFA) without E-moves, Conversions, Equivalence, NFA with E-moves, Regular expression designing, Finite machine with output assigned, Moore and mealy machines, Conversion and Equivalence.  
**(12 hours)**

**Section- B**

**Turing Machines:** -Turing Hypothesis, Turing Computability, Non- deterministic, Multitape and other versions of Turing machines, Churches Hypothesis, Primitive Recursive functions, Universal Turing machines, decidability, Halting problem, Stack Automata.  
**(10 hours)**

**Regular Grammar & Context free Languages:** -Context Free Grammar, Context free Languages, reduced form of Grammar, Ambiguous and Non- Ambiguous grammar, acceptors and generators, Relations between Classes of Languages, Pumping lemma of regular sets, Chomsky's hierarchy of languages, derivation Trees.  
**(10 hours)**

**BOOKS RECOMMENDED:**

- |   |                                       |
|---|---------------------------------------|
| 1. Introduction to Automata Languages & Computation | A.V. AHO, J. E. Hopcroft& J.D. Ullman |
| 2. Introduction Theory of Computer Science          | E. V. Krishna Moorthy                 |

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

## Examination to be held in the Year December 2020,2021,2022,2023

CLASS: B.E. 5<sup>th</sup> SEMESTER

CREDITS: 3

BRANCH: INFORMATION TECHNOLOGY

Marks

COURSE NO:MOC-505

Sessional

COURSE TITLE: SWAYAM/NPTEL

L	T	P
3	0	0

100

The department shall offer the SWAYAM / NPTEL course (12 weeks) out of the list of courses offered by SWAYAM around the time of commencement of the semester. However, the selected NPTEL course should not be similar to the regular courses offered as a part of the department curriculum. The overall monitoring of the NPTEL course will be under the supervision of the teacher in charge of the department.

The NPTEL/SWAYAM certification course comprises of Assignments (25%) and Proctor Examination (Online examination MCQ's based = 75%) conducted at the end of the semester by IIT Madras as per the schedule.

The marks obtained by the student in the NPTEL/SWAYAM certification course will be tabulated by the concerned department.

**Note :-** In case the student does not pass the certification exam or remains absent in the proctor examination, no certificate will be given to the candidate by the NPTEL and the student will be deemed to have failed in the course. The examination of the said NPTEL course will be taken by the department concerned in the next semester under the supervision of Examination Cell of GCET Jammu. The paper will be of 75 marks and assignment marks will be carried forward from the previous semester.

## Examination to be held in the Year December 2020,2021,2022,2023

CLASS: B.E. 5<sup>th</sup> SEMESTER

CREDIT: 1

BRANCH: INFORMATION TECHNOLOGY

COURSE NO.: PIT-511

L T P

Marks

COURSE TITLE: COMPUTER NETWORKS LAB

0 0 2

Practical

50

### LABORATORY OUTCOMES

After Completion of this course the student will be able to: -

CO1	Understand fundamental underlining principles of computer networking.
CO2	Understand details and functionality of layered network architecture.
CO3	Apply mathematical foundations to solve computational problems in Computer Networking.
CO4	Analyse performance of various communication protocols.
CO5	Practice packet/ file transfer between nodes.

### Lab Experiments:

Experiment 1	To study different types of networking cables.
Experiment 2	To implement the cross-wired cable and straight through cable using crimping tool.
Experiment 3	To study about different networking devices.
Experiment 4	To connect two computers in a local area network and to share file between them.
Experiment 5	To study about IP addressing.
Experiment 6	To implement various topologies using the LAN trainer kit.
Experiment 7	To study the UDP protocol and TCP protocol using the LAN trainer software.
Experiment 8	WAP on bit stuffing and character stuffing using any language.

NOTE: Additional Lab experiments/ practicals will be performed based on the course contents requirements.

## Examination to be held in the Year December 2020,2021,2022,2023

CLASS: B.E. 5<sup>th</sup> SEMESTER

CREDIT: 1

BRANCH: INFORMATION TECHNOLOGY

COURSE NO.: PIT-512

COURSE TITLE: RDBMS LAB

L	T	P
0	0	2

Marks
Practical
50

### LABORATORY OUTCOMES

After Completion of this course the student will be able to: -

CO1	Apply the basic concepts of Database Systems and Applications.
CO2	Design and Implement a database schema.
CO3	Devise queries using DDL, DML, DCL and TCL commands.
CO4	Design a commercial relational database system (Oracle) by writing SQL using the system.
CO5	Analyse and select storage and recovery techniques of database system.

### Lab Experiments:

Experiment 1	Identify the case study and detail statement of problem. Design an Entity- Relationship (ER) / Extended Entity-Relationship (EER) Model.
Experiment 2	Mapping ER/EER to Relational schema model.
Experiment 3	Create a relational database system using DDL commands with constraints
Experiment 4	Update the database system using DML commands
Experiment 5	Apply Integrity constraints for the specified system.
Experiment 6	Query the database using simple and complex queries
Experiment 7	Apply Integrity Constraints for the specified system
Experiment 8	Perform Nested queries
Experiment 9	Perform Join operations
Experiment 10	High level programming language extensions (Control structures, Procedures and Functions)

**NOTE:** Additional Lab experiments/ practical's will be performed based on the course contents requirements.

## Examination to be held in the Year December 2020,2021,2022,2023

CLASS: B.E. 5<sup>th</sup> SEMESTER

CREDIT: 1

BRANCH: INFORMATION TECHNOLOGY

COURSE NO.: PIT-513

COURSE TITLE: MICROPROCESSOR & INTERFACING LAB

L	T	P
0	0	2

Marks
Practical
50

### LABORATORY OUTCOMES

After Completion of this course the student will be able to: -

CO1	To classify and apply the instruction set of 8085 and 8086 microprocessors.
CO2	To design, code and debugs Assembly Language programs to implement simple programs.
CO3	To apply programming knowledge using the capabilities of the stack, the program counter
CO4	To execute a machine code program on the training boards.
CO5	To develop ALP for fixed point and floating point and arithmetic operations using 8086 microprocessor

### Lab Experiments:

Experiment 1	Block Transfer: - Data bytes are stored in memory locations from XX50H to XX5FH to insert an additional five bytes of data, it is necessary to shift the data string by five memory location. Write a program to store a data string from XX55H to XX64H. Use any 16 bytes of data to verify your program.
Experiment 2	Addition with Carry: Six bytes of data are stored in memory locations starting at XX50H. dd all the data bytes. Use register B to save any carry generated while adding the data bytes. Store the sum at two consecutive memory locations XX70H and XX71H.
Experiment 3	Checking for a particular data byte: A set of eight readings is stored in memory location starting at XX50H. Write a program to check whether a byte 40H exists in the set. If it does, stop checking, and display its memory location, otherwise output FFH.
Experiment 4	Write a program for BCD to Seven Segment LED code conversion.
Experiment 5	Write a program for Binary to ASCII code conversion.
Experiment 6	Write a program for BCD addition.
Experiment 7	Write a program for multiplication of Two 8 bit unsigned nos.
Experiment 8	Write a program to implement Stack operation.
Experiment 9	Write a program to implement procedures.
Experiment 10	Write a program to implement delay loops.

**NOTE:** Additional Lab experiments/practicals will be performed based on the course contents requirements

## Examination to be held in the Year December 2020,2021,2022,2023

CLASS: B.E. 5<sup>th</sup> SEMESTER

CREDIT:2

BRANCH: INFORMATION TECHNOLOGY

COURSE NO.: PIT-515

COURSE TITLE: INDUSTRIAL TRAINING

L	T	P
-	-	2

Marks

Practical

50

### COURSE OUTCOMES

At the end of the course the student will be able to: -

<b>CO1</b>	Interact and study with a range of students and to practice multiple management skills, including communication, independent action and teamwork.
<b>CO2</b>	Understand the engineering code of ethics and be able to apply them as necessary.
<b>CO3</b>	Demonstrate knowledge of practical application of training.
<b>CO4</b>	Submit a training report along with the certificate issued by the concerned department.

Students are required to undertake 4 to 6 weeks Practical Training during the summer vacations in the field of Computer Engineering and applications in Govt./Semi-Govt./Private sector. Thereafter, each student shall be required to submit a report on the practical training to the concern department for evaluation.

Guidelines for evaluation of Practical Training: The evaluation shall be done by the departmental committee during 5<sup>th</sup> semester. The committee shall have a convener and at least two members.

### **Distribution of Marks as per the University statutes:**

Total Marks for Evaluation	= 50 marks	
i) Report	= 15	30%
ii) Viva-Voce & Presentation	= 25	50%
iii) Level of IT	= 10	20%

Due weight age will be given to those who have opted for Industrial Training outside the State as well as keeping in view the profile of that Industry.

### **Award of the Marks:**

Marks under (i), (ii) & (iii) will be awarded by the departmental committee constituted for the purpose.

**ANNEXURE-II**

**UNIVERSITY OF JAMMU, JAMMU**

**COURSE SCHEME**

**B.E 6<sup>th</sup> Semester Information Technology**

**For Examination to be held in the Year May 2021,2022,2023,2024.**

**Contact Hrs/Week: 21**

COURSE CODE	COURSE TYPE	COURSE TITLE	LOAD ALLOCATION			MARKS DISTRIBUTION		TOTAL	Credits	% Change
			L	T	P	Internal	External			
HMC-601	Humanities & Social Science Course	Managerial Economics	3	1	0	50	100	150	4	100%
MOC-605	Massive Open Online Course	SWAYAM/NPTEL	3	0	0	100	-	100	3	100%
PIT-602	Professional Core Course	Analysis & Design of Algorithms	3	1	0	50	100	150	4	100%
PIT-603	Professional Core Course	Software Engineering	3	1	0	50	100	150	4	100%
PIT-604	Professional Elective Course	Elective-I	3	1	0	50	100	150	4	100%
PIT-611	Professional Elective Course	Elective-I Lab	0	0	2	50	-	50	1	100%
PIT-612	Professional Core Course	Web Designing & Android Development Lab	0	0	2	50	-	50	1	100%
<b>TOTAL</b>			<b>15</b>	<b>4</b>	<b>4</b>	<b>400</b>	<b>400</b>	<b>800</b>	<b>21</b>	

<b>Elective-I</b>	
PIT-604 (A)	Soft Computing
PIT-604 (B)	Micro Controller & Embedded Systems
PIT-604(C)	Python programming
<b>Elective-I Lab</b>	
PIT -611(A)	Soft Computing Lab
PIT -611 (B)	Micro Controller & Embedded Systems Lab
PIT -611(C)	Python programming Lab

**\*Note:** The Department shall offer the SWAYAM/NPTEL course out of the list of the courses offered by SWAYAM around the time of commencement of the semester. However the selected NPTEL course should not be similar to the regular courses offered as a part of the department curriculum.

## Examination to be held in the Year May 2021,2022,2023,2024

CLASS: B.E. 6<sup>th</sup> SEMESTER

CREDITS: 4

BRANCH: INFORMATION TECHNOLOGY

Marks

COURSE NO: HMC-601

COURSE TITLE: MANAGERIAL ECONOMICS

L	T	P	Theory	Sessional
3	1	0	100	50

DURATION OF EXAM: 3 HOURS

### COURSE OUTCOMES

At the end of the course, students will be able to:

CO1	Understand in detail about managerial economics and hence shall be a good decision maker.
CO2	Understand about business environment of a country after acquiring knowledge in detail about demand analysis and consumer behaviour.
CO3	Be a good decision maker after acquiring knowledge about demand forecasting techniques.
CO4	Suggest producing the products at minimum cost by studying in detail about the cost curves and market structures.
CO5	Have knowledge of macroeconomics concepts such as, index numbers, business cycle, banking, inflation, etc. and will be able to apply them in day to day life.

### Detailed Syllabus

#### Section A

**Meaning and Importance of Managerial Economics:** Introduction, Meaning, Scope of Managerial Economics, Role and responsibilities of managerial economist, Relationship of managerial economics with other disciplines: Importance of Managerial Economics in decision making, the basic process(steps) of decision making. **(05 hours)**

**Demand Analysis:** Introduction, meaning of demand and Law of Demand, factors affecting demand; exceptions to the law of demand; Elasticity of Demand (Price, income and cross elasticity of demand) **(06 hours)**

**Consumer Behavior:** Cardinal utility analysis: Concept: law of diminishing marginal utility: law of equi marginal utility, Ordinal utility analysis: meaning and properties of Indifference curves and utility maximization (consumer equilibrium). **(05 hours)**

**Demand Forecasting:** Introduction, Meaning and importance of demand Forecasting: Methods or Techniques of Demand Forecasting, Survey Methods, Statistical Methods, Demand Forecasting for New Products. **(04 hours)**

#### Section B

**Production and cost Analysis:** Meaning of Production function, Isoquants (meaning and properties) law of variable proportions, law of returns to scale, Cost Analysis: Concept of Fixed, Variable, Total, Average & Marginal Costs & their relationships in short run. **(06 hours)**

**Market structure and pricing decisions** - Introduction, Perfect Competition, monopoly (Price-Output Determination under Perfect Competition and monopoly in short run and long run),; kinked demand curve analysis of price stability(Sweezy's model) **(05 hours)**

#### **Macroeconomic environment**

Index Numbers-Meaning, construction and difficulties in measurement of Index number and its uses: meaning and phases of Trade /business cycle. **(05 hours)**

**Banking and inflation**-Functions of central bank and methods of credit control: functions of Commercial bank and methods of credit creation, Inflation (Types, effects and methods to control inflation). **(06 hours)**

#### **BOOKS RECOMMENDED :**

1. K.K.Dewett : Modern Economic Theory
2. H.L Ahuja : Advanced Economic Theory
3. M.L. Jhingan : Macro Economic Theory
4. P.N Chopra : Business Economics/Advanced Eco. Theory
5. D,N,Dwivedi :Managerial Economics
6. A. Koutsoyiannis : Modern microeconomics

**NOTE:** There shall be total eight questions, four from each section. Each question carries 20 marks. Five questions will have to be attempted, selecting at least two from each section. Use of calculator is allowed.

## Examination to be held in the Year May 2021,2022,2023,2024

CLASS: B.E. 6<sup>th</sup> SEMESTER

CREDITS: 3

BRANCH: INFORMATION TECHNOLOGY

COURSE NO: MOC-605

COURSE TITLE: SWAYAM/NPTEL

L	T	P
3	0	0

Marks
Sessional
100

The department shall offer the SWAYAM / NPTEL course (12 weeks) out of the list of courses offered by SWAYAM around the time of commencement of the semester. However, the selected NPTEL course should not be similar to the regular courses offered as a part of the department curriculum. The overall monitoring of the NPTEL course will be under the supervision of the teacher incharge of the department.

The NPTEL/SWAYAM certification course comprises of Assignments (25%) and Proctor Examination (Online examination MCQ's based = 75%) conducted at the end of the semester by IIT Madras as per the schedule.

The marks obtained by the student in the NPTEL/SWAYAM certification course will be tabulated by the concerned department.

**Note :-** In case the student does not pass the certification exam or remains absent in the proctor examination, no certificate will be given to the candidate by the NPTEL and the student will be deemed to have failed in the course. The examination of the said NPTEL course will be taken by the department concerned in the next semester under the supervision of Examination Cell of GCET Jammu. The paper will be of 75 marks and assignment marks will be carried forward from the previous semester.

## Examination to be held in the Year May 2021,2022,2023,2024

CLASS: B.E. 6<sup>th</sup> SEMESTER

CREDITS: 4

BRANCH: INFORMATION TECHNOLOGY

COURSE NO: PIT-602

COURSE TITLE: ANALYSIS & DESIGN OF ALGORITHMS

DURATION OF EXAM: 3 HOURS

Marks				
L	T	P	Theory	Sessional
3	1	0	100	50

### COURSE OUTCOMES

At the end of the course the student will be able to: -

CO1	Gain knowledge about the techniques for effective problem solving in computing.
CO2	Implement various design and analysis techniques such as greedy algorithms, dynamic programming.
CO3	Interpret the techniques used for designing different graph algorithms.
CO4	Apply backtracking, branch and bound techniques for real time problems.
CO5	Evaluate the concepts of P, NP and NP-Complete problems and synthesize algorithm in common engineering designing situations.

### Detailed Syllabus

#### Section- A

**Introduction to Algorithms:** Analysing the Performance of an Algorithm, Space/Time complexity, Asymptotic Notation, Recurrence Relations, Performance measurement, write Algorithms in SPARK's. **(04 hours)**

**Heap & Hash Tables:** - Representing a Heap, Operations on Heaps, Applications, building a Heap, Hash Table, Hashing Functions, Resolving Collision by separate Chaining, Open Addressing, Quadratic Probing, Double Hashing, Rehashing. **(06 hours)**

**Lower Bound Theory:** - Comparison Trees for searching & Sorting, Parallel Comparison trees, Oracle & Adversary Arguments, Lower Bounds through Reduction. **(04 hours)**

**NP-Hard and NP-Complete Problems:** -Basic concepts, Non-Deterministic Algorithms, Polynomial Time Algorithms, NP-hard & NP –complete classes, Cook's Theorem, Introduction to Approximation Algorithms. **(04 hours)**

#### Section- B

**Design Techniques:** -

**Divide and Conquer:** - General methods, Binary Search, Finding the Maximum & Minimum, Merge sort, Quick Sort & Selection sort, Strassen's Matrix, Multiplication. **(08 hours)**

**Greedy Method:** - General Methods, Optimal Storage on Tapes, Knapsack Problem, Job Sequencing with Deadlines, Optimal Merge Patterns, Single Source, shortest path. **(06 hours)**

**Dynamic Programming:** - General Methods, Multistage Graphs, I/O Knapsack, Reliability Design, Travelling Salesperson problem. **(04 hours)**

**Back Tracking:** - General Method, The 8- Queens Problem, Hamiltonian Cycles, Knapsack Problem.

**Branch & Bound:** - The method, I/O Knapsack Problem, Travelling Salesperson Problem. **(03 hours)**

#### **BOOKS RECOMMENDED:**

1. Fundamentals of Computer Algorithms. Ellis Horowitz, Sartaj Sahni.
2. Data Structure & Algorithm J.M. Hopcraft, Ullman

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

## Examination to be held in the Year May 2021,2022,2023,2024

CLASS: B.E. 6<sup>th</sup> SEMESTER

CREDITS: 4

BRANCH: INFORMATION TECHNOLOGY

COURSE NO: PIT-603

COURSE TITLE: SOFTWARE ENGINEERING

DURATION OF EXAM: 3 HOURS

Marks

L	T	P	Theory	Sessional
3	1	0	100	50

### COURSE OUTCOMES

At the end of the course the student will be able to: -

CO1	Understand the basics of software and its engineering paradigms
CO2	Analyse the software requirement, planning and estimation techniques
CO3	Implement the various software design procedures and data flow diagrams
CO4	Analyse and evaluate the quality of software
CO5	Compare and analyse the various software testing techniques and maintenance.

### Detailed Syllabus

#### **Section A**

**Introduction to Software Engineering:** - Software Considerations: Software characteristics Software crisis Software myths, Software Engineering paradigms. **(04 hours)**

**System and software Planning:** - Planning phase of system definition, system analysis, Modelling the system architecture, system specification, Software planning objectives, Software scope, Software project estimation, Decomposition techniques, Empirical estimation models, Automated estimation models, Software project scheduling, Software acquisition, Software re-engineering. **(06 hours)**

**Software requirement analysis:** - Requirement analysis, Analysis principles, specifications requirement analysis tools, Data flow diagrams. **(06 hours)**

**Software Design Fundamentals:** - The design process, Design fundamentals, Effective modular design, Data design, Architectural design, procedural design, Design documentation. **(04 hours)**

#### **Section B**

**Data flow-oriented design:** Design and information flow, design process considerations, transform analysis, transaction analysis, Design post processing, Design optimization. Design process considerations. Jackson System development. **(06 hours)**

**Software Quality Assurance:** - Software quality and software quality assurance, Software reviews, software quality metrics, software reliability, complexity measures, storage and processing time analysis. **(06 hours)**

**Software testing and maintenance:** - Software Testing Fundamentals, Whitebox Testing, Basic Path Testing, Control Structure Testing, Black Box Testing. Software Testing Strategies, Unit Testing Integration Testing, Validation Testing, System Testing. **(06 hours)**

**Software maintenance:** Definition, Maintenance characteristics, Maintainability, Maintenance Tasks, Maintenance Side Effects, Reverse Engineering and Re-engineering. **(04 hours)**

#### **Reference books:-**

- |   |                |
|---|----------------|
| 1. Software Engineering, A practitioner's approach: | R.S. Pressman. |
| 2. Integrated approach to Software Engineering:     | Pankaj Jalote  |
| 3. Software Engineering:                            | M.L. Shooman.  |

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

## Examination to be held in the Year May 2021,2022,2023,2024

CLASS: B.E. 6<sup>th</sup> SEMESTER

CREDITS: 4

BRANCH: INFORMATION TECHNOLOGY

Marks

COURSE NO: PIT -604 (A)(ELECTIVE-I)

L	T	P	Theory	Sessional
3	1	0	100	50

COURSE TITLE: SOFT-COMPUTING

DURATION OF EXAM: 3 HOURS

### COURSE OUTCOMES

At the end of the course the student will be able to: -

CO1	Acquire knowledge about Artificial Neural Networks and learning mechanisms.
CO2	Master basic neural network models and their training using BPN.
CO3	Implement Fuzzy reasoning in developing Fussy Associative Memory (FAM).
CO4	Understand the concept of Neuro-Fuzzy modelling by its implementation in classification and regression trees
CO5	Acquire the knowledge of evolutionary computation and genetic algorithm to tackle real world problems.

### Detailed Syllabus

#### Section- A

**Artificial Neural Networks:** Basic concepts - Single Layer Perception-Multilayer Perception-Supervised and Unsupervised learning-Back propagation Networks-Kohen's self-organizing Networks-Hopfield network, Feed forward network, Hopfield network. **(06 hours)**

**Neural network models:** neural network models, layers in neural network and their connections. Instar, outstar, weights on connections, threshold function, application-Adaline and Madeline **(04 hours)**

**Back propagation:** feed forward back propagation network-mapping, layout, training, BPN applications **(04 hours)**

**Learning and training:** objectives of learning, Hebb's rule, delta rule, learning vector quantizer, associative Memory models, one-shot learning, resonance, stability, training and convergence **(06 hours)**

#### SECTION B

**Fuzzy Systems:** Fuzzy sets and Fuzzy Reasoning-Fuzzy Matrices-Fuzzy Functions-Decomposition-Fuzzy automata and languages - Fuzzy Control Methods-Fuzzy decision making. **(06 hours)**

**BAM-** Bidirectional associative memory, inputs and outputs, weights and training. FAM-fuzzy associative memory, association. **(04 hours)**

**Neuro - Fuzzy Modelling:** Adaptive networks based Fuzzy interface systems - Classification and Regression Trees -Data clustering algorithms - Rule based structure identification - Neuro-Fuzzy controls -Simulated annealing – Evolutionary computation. **(06 hours)**

**Genetic Algorithms:** Survival of the Fittest - Fitness Computations - Cross over - Mutation -Reproduction -Rank method - Rank space method. **(04 hours)**

#### **BOOKS RECOMMENDED:**

- |  |                                      |
|--|--------------------------------------|
| 1. Neuro-Fuzzy and Soft computing            | Jang J.S.R., Sun C.T. and Mizutani E |
| 2. Fundamentals of Neural Networks           | Laurene Fausett.                     |
| 3. Artificial Intelligence - A New Synthesis | N. J. Nelsson                        |

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

## Examination to be held in the Year May 2021,2022,2023,2024

CLASS: B.E. 6<sup>th</sup> SEMESTER

CREDITS: 4

BRANCH: INFORMATION TECHNOLOGY

COURSE NO: PIT-604 (B)(ELECTIVE-I)

COURSE TITLE: MICROCONTROLLER & EMBEDDED SYSTEMS

DURATION OF EXAM: 3 HOURS

		Marks	
L	T	P	Theory
3	1	0	100
			Sessional
			50

### COURSE OUTCOMES

At the end of the course the student will be able to: -

CO1	To understand the knowledge of general architecture of a microcontroller.
CO2	To classify and apply the instruction set of 8051 and AVR microcontrollers and the use of different instructions.
CO3	To analyse architecture and operation of embedded system using arduino and raspberry pie development boards.
CO4	To create the interfacing of memory and various I/O devices with microcontrollers.

### Detailed Syllabus

#### Section- A

**8051 Microcontroller:** Introduction to Microcontrollers, Evolution, Microprocessors vs. Microcontrollers, MCS-51 Family Overview, Important Features, Architecture. 8051 Pin Functions, Architecture, Addressing Modes, Interrupt Organization, Processing Interrupts, Serial Port Interrupts, External Interrupts, and Interrupt Service Routines. Memory Address Decoding, 8031/51 Interfacing with External ROM And RAM. **(10 hours)**

**Assembly programming and instruction of 8051:** Introduction to 8051 assembly programming, Assembling and running an 8051 program, Data types and Assembler directives, Arithmetic, logic instructions and programs, Jump, loop and call instructions, IO port programming.

**8051 interfacing with 8255-** Programming the 8255, 8255 interfacing, C programming for 8255. **(12 hours)**

#### Section- B

**Embedded system :** concept - characteristic features - architecture - application areas - specialties - embedded operating system - types - activities of an embedded OS like task, task scheduling, context switching, mutual exclusions and inter task communications - memory management and timer services - general architecture of OS - kernel - categories of embedded OS - examples - concept of arduino and raspberry pie development boards. **(10 hours)**

**Introduction to AVR microcontroller:** Overview of AVR family, AVR Microcontroller architecture, status register, Special function registers, RAM, ROM & EEPROM space, On-Chip peripherals, ATmega32 pin configuration & function of each pin, Fuse bits of AVR. **(05 hours)**

**AVR assembly language programming:** AVR data types and assembler directives, addressing modes of AVR, Data transfer, Arithmetic, Logic and Compare, Rotate and Shift, Branch and Call instructions, AVR studio setup for assembly language programming, AVR I/O Port Programming, Time delay loop, Look-up table. **(08 hours)**

#### **BOOKS RECOMMENDED:**

1. The 8051 Microcontroller and Embedded Systems, Mazidi Muhammad Ali  
second edition, Pearson publications
2. The AVR Microcontroller and Embedded Systems using assembly and C - - Pearson Education. Muhammad Ali Mazidi, Sarmad Naimi and Sepehr Naimi
3. Programming and Customizing the AVR Microcontroller Dhananjay Gadre, McGraw Hill Education

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

## Examination to be held in the Year May 2021,2022,2023,2024

CLASS: B.E. 6<sup>th</sup> SEMESTER

CREDITS: 4

BRANCH: INFORMATION TECHNOLOGY

COURSE NO: PIT -604 (C) (ELECTIVE-I)

COURSE TITLE: Python Programming

DURATION OF EXAM: 3 HOURS

Marks				
L	T	P	Theory	Sessional
3	1	0	100	50

### COURSE OUTCOMES

At the end of the course the student will be able to: -

CO1	To Understand basics of python
CO2	To develop console application in python
CO3	To develop database application in python
CO4	Apply the concept of file handling in python and basic machine learning application

### Detailed Syllabus

#### Section- A

**Introduction to Python Programming Language:** -Introduction to Python Language, Strengths and Weaknesses, IDLE, Dynamic Types, Naming Conventions, String Values, string Operations, String Slices, String Operators, Numeric Data Types, Built In Functions. **(10 hours)**

**Data Collections and Language Component:** - Introduction, Control Flow and Syntax, Indenting, The if Statement, Relational Operators, Logical Operators, True or False, Bit Wise Operators, The while Loop, break and continue, The for Loop, Lists, Tuples, Sets, Dictionaries, Sorting Dictionaries, Copying Collections. **(5 hours)**

**Functions and Modules :-** Introduction Defining Your Own Functions Parameters Function Documentation Keyword and Optional Parameters Passing Collections to a Function Variable Number of Arguments Scope Functions - "First Class Citizens" Passing Functions to a Function Mapping Functions in a Dictionary Lambda Modules Standard Modules – sys Standard Modules – math Standard Modules – time The dir Function **(6 hours)**

#### Section- B

**Object and Classes:** - Classes in Python, Principles of Object Orientation, Creating Classes, Instance Methods Special Methods Class Variables, Inheritance, Polymorphism. **(6 hours)**

**I/O and Error Handling In Python:** Introduction, Data Streams, Creating Your Own Data Streams, Access Modes, Writing Data to a File, Reading Data From a File, Additional File Methods, Handling IO Exceptions, Working with Directories, Errors, Run Time Errors, The Exception Model, Exception Hierarchy, Handling Multiple Exceptions. **(10 hours)**

#### **Text Book:**

1. Think Python, by Allen B. Downey, second edition, O'Reilly, Sebastopol, California.
  2. Online Version [www.greenteapress.com/thinkpython2.pdf](http://www.greenteapress.com/thinkpython2.pdf).
  3. How to think like a computer Scientist, by Brad Miller and David Ranum.
  4. Python Programming: An Introduction to Computer Science, by John Zelle.
- Online Version: [www.interactivepython.org/runstone/static/thinkscpy/index.html](http://www.interactivepython.org/runstone/static/thinkscpy/index.html).

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

## Examination to be held in the Year May 2021,2022,2023,2024

CLASS: B.E. 6<sup>th</sup> SEMESTER

CREDIT: 1

BRANCH: INFORMATION TECHNOLOGY

COURSE NO.: PIT -611 (A) (ELECTIVE-I)

COURSE TITLE: SOFT-COMPUTING LAB

L    T    P  
0    0    2

Marks  
Practical  
50

### LABORATORY OUTCOMES

After Completion of this course the student will be able to: -

CO1	Install MATLAB and its working environment.
CO2	Implement single layer and multilayer Perceptron Models using NN.
CO3	Understand the implementation of KSOM, BPNN and Associative memory.
CO4	Implement Fuzzy associative memory (FAM).
CO5	Acquire the knowledge of evolutionary computation and genetic algorithms.

### Lab Experiments:

Experiment 1	Introduction to Neural Networks and Perceptron Example
Experiment 2	Multilayer Perceptron and Application
Experiment 3	Probabilistic Neural Networks and Application
Experiment 4	Introduction to Fundamental of Fuzzy Logic and Basic Operations
Experiment 5	Fuzzy Inference System(FIS)
Experiment 6	Fuzzy Weighted Average and Application
Experiment 7	Fuzzy Control and Application

**NOTE:** Additional Lab experiments/practical's will be performed based on the course contents requirements.

## Examination to be held in the Year May 2021,2022,2023,2024

CLASS: B.E. 6<sup>th</sup> SEMESTER

CREDIT: 1

BRANCH: INFORMATION TECHNOLOGY

COURSE NO.: PIT -611 (B) (ELECTIVE-I)

COURSE TITLE: MICRO CONTROLLER & EMBEDDED SYSTEMS LAB

L T P  
0 0 2

Marks  
Practical  
50

### LABORATORY OUTCOMES

After Completion of this course the student will be able to: -

CO1	Apply programming language using 8051 microcontroller to meet the requirements of the user.
CO2	Design, code and debug Assembly Language programs to implement simple programs.
CO3	Interface peripherals like switches, LEDs, stepper motor, Traffic lights controller, etc.
CO4	Apply programming language using AVR microcontroller kit.

### Lab Experiments:

Experiment 1	Study and familiarization of 8051 Microcontroller trainer kit
Experiment 2	Assembly Language Program for addition of 8-bit numbers stored in an array
Experiment 3	Assembly Language Program for Multiplication by successive addition of two 8-bit numbers
Experiment 4	Assembly Language Program for finding largest no. from a given array of 8-bit numbers
Experiment 5	Assembly Language program to arrange 8-bit numbers stored in an array in ascending order
Experiment 6	Stepper motor control by 8051 Microcontroller
Experiment 7	Interfacing of 8-bit ADC 0809 with 8051 Microcontroller
Experiment 8	Interfacing of 8-bit DAC 0800 with 8051 Microcontroller and Waveform generation using DAC
Experiment 9	Implementation of Serial Communication by using 8051 serial ports
Experiment 10	Study of AVR Controller.
Experiment 11	Assembly Language Programs using AVR.

**NOTE: Additional Lab experiments/practical's will be performed based on the course contents requirements.**

## Examination to be held in the Year May 2021,2022,2023,2024

CLASS: B.E. 6<sup>th</sup> SEMESTER

CREDIT: 1

BRANCH: INFORMATION TECHNOLOGY

COURSE NO.:PIT -611 (C) (ELECTIVE-I LAB)

COURSE TITLE: PYTHON PROGRAMMING LAB

L	T	P
0	0	2

Marks
Practical
50

### LABORATORY OUTCOMES

After Completion of this course the student will be able to: -

CO1	To learn how to design and program Python applications
CO2	To define the structure and components of a Python program
CO3	Apply how to write functions and pass arguments in Python.
CO4	Design object-oriented programs with Python classes
CO5	Apply the concept of exception handling in Python applications for error handling

### List of experiments:

- |               |  |
|---------------|--|
| Experiment 1  | Write python program to print Hello World  |
| Experiment 2  | Write python program to implement if else statement  |
| Experiment 3  | Write python program to implement loops  |
| Experiment 4  | Write python program to implement the concept of functions   |
| Experiment 5  | Write python program in which an function (with single string parameter) is defined and calling that function prints the string parameters given to function |
| Experiment 6  | Write python program to implement the concept of array   |
| Experiment 7  | Write python program in which an class is define, then create object of that class and call simple print function define in class                            |
| Experiment 8  | Write python program to implement exception handling mechanism   |
| Experiment 9  | Write python program to implement how to write and read primitive data to and from the file  |
| Experiment 10 | Write python program to implement how to write and read object to and from the file  |

**NOTE:** Additional Lab experiments/practicals will be performed based on the course contents requirements

## Examination to be held in the Year December 2020,2021,2022,2023

CLASS: B.E. 5<sup>th</sup> SEMESTER

CREDIT: 1

BRANCH: INFORMATION TECHNOLOGY

COURSE NO.: PIT-612

COURSE TITLE: WEB DESIGNING & ANDROID LAB

L	T	P
0	0	2

Marks
Practical
50

### LABORATORY OUTCOMES

After Completion of this course the student will be able to: -

CO1	Remember the role of languages like HTML, DHTML, CSS, JavaScript and android
CO2	Analyse a web page and identify its elements and attributes.
CO3	Implement web pages using HTML, Cascading Style Sheets and JavaScript.
CO4	Develop mobile applications using Android

### Lab Experiments:

Experiment 1	HTML code for displaying name image and hyperlinks
Experiment 2	HTML code for displaying contents styled with CSS.
Experiment 3	HTML code for accepting a form.
Experiment 4	Program to create frame and table using HTML
Experiment 5	Program to create functions using JavaScript.
Experiment 6	Program of form validation using JavaScript.
Experiment 7	Design a website on your own using HTML, CSS, JavaScript.
Experiment 8	Develop an android application representing a simple calculator
Experiment 9	Develop an android application for working with notification
Experiment 10	Develop an android application for connecting to internet and sending e-mail.
Experiment 11	Develop an android application for working with device camera

**NOTE:** Additional Lab experiments/practicals will be performed based on the course contents requirement.

## **INFORMATION TECHNOLOGY DEPARTMENT**

**B.E. Information Technology 7th Semester Examination to be held in the Year  
December 2021, 2022, 2023, 2024**

**Contact Hrs: 24**

COURSE CODE	COURSE TYPE	COURSE TITLE	LOAD ALLOCATION			MARKS DISTRIBUTION		TOT AL	CREDI TS	% CHANG E
			L	T	P	Internal	External			
PIT-701	Professional Core Course	Web programming using PHP	2	1	0	50	100	150	4	100%
PIT-702	Professional Core Course	Compiler Design	2	1	0	50	100	150	4	100%
PIT-703	Professional Core Course	Machine Learning	2	1	0	50	100	150	3	100%
ITE-701	Professional Elective Course	Elective-I	2	1	0	50	100	150	3	100%
PIT-712	Professional Core Course	Web programming using PHP Lab	0	0	2	50	-	50	1	100%
PIT-713	Professional Core Course	Machine Learning Lab	0	0	2	50	-	50	1	100%
ITE-711	Professional Elective Course	Elective-I Lab	0	0	2	50	-	50	1	100%
SII-704	Summer Industry Internship	Industrial Training	-	-	-	50	-	50	1	100%
SEM-704	Seminar	Seminar	0	0	4	50	-	50	1	100%

ECO-711	Open Elective Course	Mat Lab Programming	0	0	2	50		50	1	100%
EEO-712		Instrumentation & Non-Conventional Energy								
CSO-713		Programming Lab								
MEO-715		Theory of Machine Lab								
CEO-716		Basic Civil Testing Lab								
NCC-701	Non-Credit Course	_____	2	0	0	Satisfactory/ Unsatisfactory			Non-Credit	100%
TOTAL			10	4	10	450	400	900	20	

### CLASS:

<b>Elective-I</b>	
ITE -701 (A)	Linux Programming
ITE-701 (B)	Network Security
<b>Elective-I Lab</b>	
ITE-711 (A)	Linux programming Lab
ITE-711 (B)	Network Security Lab

**B.E. Information Technology 7<sup>th</sup> Semester Examination to be held in the Year  
December 2021, 2022, 2023, 2024**

**B.E. 7<sup>th</sup> SEMESTER**

**CREDITS: 4**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE NO: PIT-701**

**COURSE TITLE: Web programming using PHP**

**DURATION OF EXAM: 3 HOURS**

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

**COURSE OUTCOMES**

**At the end of the course the student will be able to: -**

<b>CO1</b>	Write PHP scripts to embedding of PHP into HTML program, Data Types, Variable, Operators, Decision Making etc
<b>CO2</b>	Develop PHP programs that use various PHP library functions
<b>CO3</b>	Write program to create session and cookies in PHP application
<b>CO4</b>	Write a program in PHP how to receive and process form submission data.
<b>CO5</b>	Develop database-driven application using PHP and MySQL

**Detailed Syllabus**

**Section- A**

Introduction to PERL and Scripting: Scripts and Programs, Origin of Scripting , Characteristics of Scripting Languages PHP: Versions of PHP, Installation of PHP, Testing Installation. Building Blocks of PHP: Variables, Data types, Operators, Expressions, Constants. (10 hrs)

PHP Basics- Features, Embedding PHP Code in your Web pages, Outputting the data to the browser, Function, Creating a Function, Function Libraries, Arrays, Strings and Loops. (10 hrs)

**Section B**

Forms: Creating simple input Form. Accessing Form input with user defined arrays, Redirecting User. URL rewriting: Using Hidden field, Using cookies ,Using session, Uploading Files with PHP, Sending Email using PHP.(10 hrs)

Database Connectivity: Connecting to the MySQL: Selecting a database, Adding data to a table, Displaying data, Inserting data, Deleting data and Updating data,Executing multiple queries in PHP.(8 hrs)

<b>BOOKS RECOMMENDED:</b>		
1.	The World of Scripting Languages	David Barron
2.	Beginning PHP and MySQL, 3 <sup>rd</sup> Edition	Jason Gilmore.
3	PHP 5.1,1.	.Bayross and S.Shah

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

**B.E. Information Technology 7<sup>th</sup> Semester Examination to be held in the Year  
December 2021, 2022, 2023, 2024**

**CLASS: B.E. 7<sup>th</sup> SEMESTER**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE NO: PIT-702      CREDITS: 4**

**COURSE TITLE: COMPILER DESIGN**

**DURATION OF EXAM: 3 HOURS**

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

<b><u>COURSE OUTCOMES</u></b>	
<b>At the end of the course the student will be able to: -</b>	
<b>CO1</b>	Remember the functionality of each phase involved in Compilation process and understand intermediate code representations.
<b>CO2</b>	Apply the parsing techniques including Bottom-up and Top-down parsing for the given programming construct described in Context Free Grammar.
<b>CO3</b>	Analyze the concepts of storage administration for different programming environments
<b>CO4</b>	Evaluate different error recovery routines to recover the errors seen at different phases of compilation.
<b>CO5</b>	Create the machine code by considering all the functionalities involved in different phases of the compilation process.

**Detailed Syllabus**

**Section- A**

**Introduction**—Languages Processors, the typical structure of a Compiler (2hrs)

**Programming Language** –High level programming languages, definition of programming languages, the syntax and semantics of basic data and control structures in high level programming languages. (3hrs)

**Lexical analysis** –Role of Lexical Analyzer, input buffering, a simple approach to Design of Lexical Analyzers, Regular Expressions, Finite Automata, Regular expression to Finite Automata, Conversion of NFA to DFA, Minimizing the number of states of a DFA (8 hrs).

**The Syntactic Specification of Programming Languages** –Definition of Grammars (Context free grammar), derivation, parse tree, ambiguity, non-context free language constructs. (3hrs)

**Basics Parsing Techniques** –Parsers- Shift reduce parsing, Operator precedence parsing, top-down parsing, Predicative parsers, LR parsers (4hrs)

**Section- B**

**Syntax directed translation**- Syntax directed translation schemes. Implementation of syntaxdirected translators. (3hrs)

**Intermediate code Generation** - Intermediate code, postfix notation, three address code-  
quadruples triples, translation of Assignment statement, Boolean Expression, Statements that  
alter the flow of control (05 hrs)

**Symbol Table Organization** –The content of symbol table, Data structure of symbol table

**Run- Time memory Allocation**-Static and Dynamic memory allocation, Static allocation of  
space– Activation trees, activation records, Procedure calls, parameter passing (8 hrs)

**Error Detection and Recovery**-Errors, lexical phase errors, syntactic phase errors, semantic  
errors. (2hrs)

**Code optimization**- Loop optimization, DAG Representation of basic blocks, Global data  
flowAnalysis. (3hrs)

**Code generation**- Issues in the design of code generator, Peephole optimization, a simple  
code generator Register Allocation & Assignment (2hrs)

BOOKS RECOMMENDED:		
1.	Principles of compiler design	Alfred V.Aho, Jeffrey D Ullman
2.	Theory of parsing Translation & Compiling	Aho. Ullman
3.	Compiler construction	MunishJha

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students  
are required to attempt five questions selecting at least two questions from each  
section. Use of Calculator is allowed.

**B.E. Information Technology 7<sup>th</sup> Semester Examination to be held in the Year  
December 2021, 2022, 2023, 2024**

**CLASS: B.E. 8<sup>th</sup> SEMESTER**  
**BRANCH: INFORMATION TECHNOLOGY**  
**COURSE NO: PIT-703 CREDITS: 3**  
**COURSE TITLE: MACHINE LEARNING**  
**DURATION OF EXAM: 3 HOURS**

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

**COURSE OUTCOMES**

**At the end of the course the student will be able to: -**

<b>CO1</b>	To understand basics of machine learning
<b>CO2</b>	To apply different machine learning models using various datasets
<b>CO3</b>	To develop an understanding of the role of machine learning in massive scale automation

**Detailed Syllabus**

**Section- A**

**Basics of Machine Learning:** Definition of Machine learning, Applications, Feature set, Dataset division

Introduction to Machine Learning Techniques: Supervised Learning, Unsupervised Learning and Reinforcement Learning, bias-variance tradeoff, overfitting-underfitting (5 HOURS)

**Supervised learning:** Classification and Regression: K-Nearest Neighbor, Linear Regression, Logistic Regression, gradient descent algorithm, Support Vector Machine (SVM), Evaluation Measures: SSE, MME, R2, confusion matrix, precision, recall, F-Score, ROC-Curve. (9 HOURS)

**Unsupervised learning:** Introduction to clustering, Hierarchical clustering, K-means clustering, Density based clustering (6 HOURS)

**Section B**

**Bayesian learning:** Probability theory and Bayes rule, Naive Bayes learning algorithm, Bayes nets (4 HOURS)

**Decision trees:** Representing concepts as decision trees, Recursive induction of decision trees, best splitting attribute: entropy and information gain, Overfitting, noisy data, and pruning. (8 HOURS)

**Reinforcement learning and ensemble methods:** Reinforcement learning through feedback network, function approximation, Bagging, boosting, stacking and learning with ensembles, Random Forest (8 HOURS)

<b>BOOKS RECOMMENDED:</b>		
1.	Machine Learning: The New AI	EthemAlpaydin
2.	Machine Learning	Tom M. Mitchell
3.	Machine Learning: a Probabilistic Perspective	Kevin P. Murphy

**NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.**

**B.E. Information Technology Engineering 7th Semester Examination to be held in the Year  
December 2021, 2022, 2023**

**CLASS: B.E. 7<sup>th</sup> SEMESTER**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE NO: ITE -701 (A) (ELECTIVE-I)**

**CREDITS: 3**

**COURSE TITLE: LINUX PROGRAMMING**

**DURATION OF EXAM: 3 HOURS**

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

**COURSE OUTCOMES**

**At the end of the course the student will be able to: -**

<b>CO1</b>	Explain multi user OS LINUX and its basic features
<b>CO2</b>	Interpret LINUX Commands, Shell basics, and shell environments
<b>CO3</b>	Design and develop shell programming, communication, System calls and terminology.
<b>CO4</b>	Design and develop LINUX File I/O and LINUX Processes.

**Detailed Syllabus**

**Section- A**

**Overview of Linux:** What is Linux, Linux, s root in Unix, Common Linux Features, advantage of Linux, Overview of Unix and Linux architectures, Overview of Unix and Linux architectures, hardware requirements for Linux, hardware requirements for Linux, Commands for files and directories cd, ls, cp, rm, mkdir, rmdir, pwd, file, more, less, Creating and viewing files using cat, file comparisons (06 hours)

**Essential Linux commands:** Processes in Linux Process fundamentals, Connecting processes with pipes, | Redirecting input, Redirecting output Background processing , Managing multiple processes, Process scheduling – (at,batch), nohupcommand, kill, ps, who, find, sort, touch, file,File processing commands – wc, cut, paste etc ,Mathematical commands – expr, factor etc ,Creating files with vi editor. Editing files with vi editor (06 hours)

**Shell programming:** Basics of shell programming ,various types of shell available in Linux ,Comparisons between various shells ,Shell programming in bash ,Conditional statements ,Looping statements, Case statement ,Parameter passing and arguments, Shell variables ,System shell variables shell keywords ,Creating Shell programs for automating system tasks (08 hours)

**Section- B**

**System administration:** Common administrative tasks ,identifying administrative files,Configuration and log files ,Role of system administrator ,Managing user accounts -adding users ,Managing user accounts -deleting users ,Changing permissions and ownerships ,Creating

and managing groups ,Temporary disabling of users accounts ,Creating and mounting file system ,Checking and monitoring system performance ,file security & Permissions ,becoming super user using su ,Getting system information with uname, host name ,Disk partitions & sizes ,rpm command. (12 hours)

**Simple filter commands & Understanding various Servers.**Filter Commands-pr, head, tail,Filter Commands -cut, sort.Filter Commands- uniq, tr,Filter using regular expression grep,DHCPDNS,ApacheSquid,Apache,Telnet,FTP,Samba. (8 hours)

<b>BOOKS RECOMMENDED:</b>		
1.	UNIX Shell Programming, First edition, BPB.	YeswantKanethkar
2.	Red Hat Linux Bible, Wiley Dreamtech India 2005 edition.	Cristopher Negus
3.	Linux System Programming	Robert Love, O'Reilly, SPD.

**NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.**

**B.E. Information Technology Engineering 7th Semester Examination to be held in the Year  
December 2021, 2022, 2023**

**CLASS: B.E. 7<sup>th</sup> SEMESTER**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE NO: ITE -701 (B) (ELECTIVE-I)**

**CREDITS: 3**

**COURSE TITLE: NETWORK SECURITY**

**DURATION OF EXAM: 3 HOURS**

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

**COURSE OUTCOMES**

**At the end of the course the student will be able to: -**

<b>CO1</b>	Understand about the significance of Network Security.
<b>CO2</b>	Know about key principles/policies of Cyber Security.
<b>CO3</b>	Acquire knowledge about the Latest Concepts & Techniques in Cryptography.
<b>CO4</b>	Analyze Private/Public Key Management Basics.
<b>CO5</b>	Implement Digital Signature, MD5 & Authentication Protocols.

**Detailed Syllabus**

**Section- A**

**Introduction:** Introduction to N/w Security, Security Approaches, Security Policies, Principle of Security, Introduction to common attacks, IP-Spoofing, Model for N/w Security, Encryption & Decryption.  
(06 hours)

**Cryptography:** Concepts & Techniques: Introduction to Cryptography, Private/Public Key Cryptography, Plain Text, Cipher Text, Substitution and Transposition techniques, Steganography.  
(06 hours)

**Symmetric & Asymmetric Key Cryptography:** Overview, Algorithm types & modes, DES scheme, RC5, Blowfish, AES scheme, Differential and Linear Crypto analysis, Key distribution and management. Overview, Key management basics, RSA Algorithm, Digital signatures, Message digest, Hash function (SHA), Message Authentication Code (MAC), Authentication protocols.  
(08 hours)

**Section- B**

**IP Security:** Architecture, Authentication header, Encapsulating, Security payload, Security associations, Key management, E-mail security, Web security, Viruses & related threats.  
(04 hours)

**Firewalls & Intrusions:** Design principles, Characteristics, Types of firewalls, Intruders, Audit Records, Intrusion Detection Systems. (08 hours)

**Information Security & Cyber Laws:** Information security & laws, IPR, Patent law, Copyright law, Overview of cyber crimes, Security metrics – Classification, Benefits, Security tools–Attack & Penetration Tools, Defensive tools. (08 hours)

<b>BOOKS RECOMMENDED:</b>		
1.	Cryptography & Network Security	Atul Kahate
2.	Cryptography & Network Security	William Stallings
3.	Computer Networks (Latest Edition)	Andrew S. Tanenbaum

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

**B.E. Information Technology Engineering 7th Semester Examination to be held in the Year  
December 2021, 2022, 2023**

**CLASS: B.E. 7<sup>th</sup> SEMESTER**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE TITLE: ESSENCE OF INDIAN  
TRADITIONAL KNOWLEDGE**

**COURSE NO.: NCC-701**

**CREDITS: 0**

**DURATION OF EXAMINATION: 3 HOURS**

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	0	0	Satisfactory/Unsatisfactory	

**COURSE OUTCOMES**

**At the end of the course student will be able to:**

<b>CO1</b>	Know about the Vedic philosophy in detail and its relevance in present scenario.
<b>CO2</b>	Strengthen their mind and body through the knowledge of yoga.

**Detailed Syllabus**

**Section-A**

**Vedic Philosophy:** Concept of Vedas, Ethics & Values, Educational system, Knowledge of science, trade/commerce & medicines as per Vedas, Environmental ethics: Preservation & Purification, Harnessing of natural resources in alienation with nature as per Vedas.

**Section-B**

**Yoga Philosophy:** Parts of Yoga, Importance of Yam and Niyam, Stress management through yoga, Purification of mind and body through yoga.

**Note for Teacher:** The course should aim at enlightening students with the importance of ancient traditional knowledge.

**Evaluation of the course:** There will be internal evaluation based on two internal sessional and viva -voce.

**B.E. Information Technology Engineering 7th Semester Examination to be held in the Year  
December 2021, 2022, 2023**

**CLASS: B.E. 7<sup>th</sup> SEMESTER**

**CREDIT: 1**

**Hours/ Week     Marks Distribution**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Practical</b>
<b>0</b>	<b>0</b>	<b>2</b>	<b>50</b>

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE NO.: PIT -712**

**COURSE TITLE: Web programming using LAB**

**LABORATORY OUTCOMES**

After Completion of this course the student will be able to: -

<b>CO1</b>	Write a program to implement control statements in PHP
<b>CO2</b>	Write a program to implement Functions and Arrays in PHP
<b>CO3</b>	Write a program to implement sessions and cookies in PHP
<b>CO4</b>	Write a program to implement Insertion , Updation and Deletion of rows in MySQL tables.
<b>CO5</b>	Write a program to implement Database connectivity in PHP with MySQL

**Lab Experiments:**

Experiment 1	Write a program to implement conditional statements and looping statements in PHP
Experiment 2	Write a program to implement using array and functions .
Experiment 3	Create a login page having user name and password. On clicking submit, a welcome message should be displayed if the user is already registered (i.e.name is present in the database) otherwise error message should be displayed.

Experiment 4	Write a simple PHP program to check that emails are valid.
Experiment 5	Write a program to implement session and cookies in PHP
Experiment 6	Creating simple table with constraints
Experiment 7	Insertion ,Updation and Deletion of rows in MySQL tables
Experiment 8	Sorting of data using PHP
Experiment 9	Write a program to implement Database connectivity in PHP with MySQL

**NOTE: Additional Lab experiments/practical will be performed based on the course contents requirements.**

**B.E. Information Technology Engineering 7th Semester Examination to be held in the Year  
December 2021, 2022, 2023**

**CLASS: B.E. 7<sup>th</sup> SEMESTER**  
**BRANCH: INFORMATION TECHNOLOGY**  
**COURSE NO.: PIT -713**  
**CREDIT: 1**  
**COURSE TITLE: MACHINE LEARNING LAB**

**Hours/ Week      Marks Distribution**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Practical</b>
	<b>0</b>	<b>2</b>	<b>50</b>

**LABORATORY OUTCOMES**

After Completion of this course the student will be able to: -

<b>CO1</b>	Install Python
<b>CO2</b>	Understand various Loops and Conditions
<b>CO3</b>	Understand the supervised and unsupervised approaches
<b>CO4</b>	Implement various classification and regression techniques
<b>CO5</b>	Understand various performance parameters for evaluating the machine learning models

**Lab Experiments:**

Experiment 1	Implement loops and conditional statements
Experiment 2	Mathematical computing with Python packages like: numpy, Matplotlib, pandas Tensor Flow, Keras
Experiment 3	Linear regression and Logistic regression
Experiment 4	K nearest neighbour, K means clustering
Experiment 5	Support Vector Machine
Experiment 6	Naïve Bayes
Experiment 7	Decision Tree

**NOTE: Additional Lab experiments/practical will be performed based on the course contents requirements.**

**B.E. Information Technology Engineering 7th Semester Examination to be held in the Year  
December 2021, 2022, 2023**

**CLASS: B.E. 7<sup>th</sup> SEMESTER**

**CREDIT: 1**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE NO.: ITE -711 (A) (ELECTIVE-I)**

**COURSE TITLE: LINUX PROGRAMMING LAB**

**Hours/ Week**

**Marks Distribution**

L	T	P	Practical
0	0	2	50

**LABORATORY OUTCOMES**

After Completion of this course the student will be able to: -

<b>CO1</b>	Install LINUX and its working environment.
<b>CO2</b>	Understand Linux commands to manage files and file systems
<b>CO3</b>	Write a shell programs to solve a given problems
<b>CO4</b>	Write Regular expressions for pattern matching and apply them to various filters for a specific task
<b>CO5</b>	Analyze a given problem and apply requisite facets of SHELL programming in order to devise a SHELL script to solve the problem

**Lab Experiments:**

Experiment 1	Implement the Linux Shell Commands: ls, mkdir, rmdir, cd, cat, banner, touch, file, wc, sort, cut, grep, dd, dfspace, du, ulimit, Commands related to inode, I/O redirection, piping, process control commands, mails, manage the password, Vieditors wild card characters used in Linux
Experiment 2	Write a shell programs to perform operations using case statement such as 1) Addition 2) subtraction 3) multiplication 4) Division
Experiment 3	Write a shell scripts to see current date, time, username and directory.
Experiment 4	Write a shell programs to find maximum of three numbers
Experiment 5	Write a script to check whether the given no. is even/odd
Experiment 6	Write a script to calculate the average of n numbers
Experiment 7	Write a script to check whether the given number is prime or not
Experiment 8	Write a script to calculate the factorial of a given number

Experiment 9	Write a script to calculate the sum of digits of the given number
Experiment 10	Write a shell script to print file names in directory showing date of creation & serial no. of file.

**NOTE: Additional Lab experiments/practical will be performed based on the course contents requirements.**

**B.E. Information Technology Engineering 7th Semester Examination to be held in the Year  
December 2021, 2022, 2023**

**CLASS: B.E. 7<sup>th</sup> SEMESTER**

**Hours/ Week      Marks Distribution**

**BRANCH: INFORMATION TECHNOLOGY  
COURSE NO.: ITE -711 (B) (ELECTIVE-I)  
CREDIT: 1  
COURSE TITLE: NETWORK SECURITY LAB**

L	T	P	Practical
0	0	2	50

**LABORATORY OUTCOMES**

After Completion of this course the student will be able to: -

<b>CO1</b>	Implementation of Encryption /Decryption Algorithm using <b>C/C++</b> .
<b>CO2</b>	Implementation of Symmetric Cryptography Algorithm using <b>C/C++</b> .
<b>CO3</b>	Implementation of Asymmetric Cryptography Algorithm using <b>C/C++</b> .
<b>CO4</b>	Implementation of Firewalls.
<b>CO5</b>	Study of Information Security Tool.

**Lab Experiments:**

Experiment 1	To implement the simple substitution technique named Caesar cipher using C language.
Experiment 2	To write a C program to implement the Play fair Substitution technique.
Experiment 3	To write a C program to implement the Hill Cipher substitution technique.
Experiment 4	To write a C program to implement the Rail Fence Transposition technique.
Experiment 5	To write a C program to implement the Data Encryption Standard (DES).
Experiment 6	To write a C program to implement the RSA Encryption algorithm.
Experiment 7	To implement the Diffie-Hellman Key Exchange algorithm using C language.
Experiment 8	To write a C program to implement the MD5 hashing technique.

**NOTE: Additional Lab experiments/practical will be performed based on the course contents requirements.**

**B.E. Information Technology Engineering 7th Semester Examination to be held in the Year  
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**CLASS: B.E. 7<sup>th</sup> SEMESTER**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE NO.: SII-704 CREDIT:1**

**COURSE TITLE: INDUSTRIAL TRAINING**

**Hours/ Week      Marks Distribution**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Practical</b>
-	-	-	<b>50</b>

**COURSE OUTCOMES**

**At the end of the course the student will be able to: -**

<b>CO1</b>	Interact and study with a range of students and to practice multiple management skills, including communication, independent action and teamwork.
<b>CO2</b>	Understand the engineering code of ethics and apply them as necessary.
<b>CO3</b>	Demonstrate knowledge of practical application of training.
<b>CO4</b>	Submit a training report along with the certificate issued by the concerned department.

Students are required to undertake 4 to 6 weeks of Practical Training during the summer vacations in the field of Information Technology Engineering and applications in Govt./Semi-Govt./Private sector. Thereafter, each student shall be required to submit a report on the practical training to the concern HOD for the evaluation.

**Guidelines for evaluation of Practical Training:** The evaluation shall be done by the departmental committee by the end of 7<sup>th</sup> semester. The committee shall have a convener and at least two members.

**Distribution of Marks as per the University statutes:**

Total Marks for Evaluation		50 marks	
i)	Report	20	40%
ii)	Viva-Voce	15	30%
iii)	Miscellaneous Marks	15	30%

Due weightage will be given to those who have opted for Industrial Training outside the State as well as keeping in view the profile of that Industry.

**Award of the Marks:**

Marks under (i), (ii) & (iii) will be awarded by the departmental committee constituted for the purpose.

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**CLASS: B.E. 7<sup>th</sup> SEMESTER**  
**BRANCH: INFORMATION TECHNOLOGY**  
**COURSE NO.: SEM-704**  
**CREDIT: 1**  
**COURSE TITLE: SEMINAR**

**Hours/ Week      Marks Distribution**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Practical</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>50</b>

**COURSE OUTCOMES**

**At the end of the course the student will be able to: -**

<b>CO1</b>	Select a topic relevant to the field of Information Technology engineering.
<b>CO2</b>	Undertake a review of the literature on the chosen topic.
<b>CO3</b>	Prepare and present a technical report.

This will involve a detailed study of a topic of interest reproduced in the candidate's own style. For this, a student has to prepare a seminar by doing proper survey of literature, compilation of information so gathered and then presentation of the same followed by question-answer session. The report of which has to be submitted by the student well before the conduct of seminar. The handout submitted by the student will be in accordance with the standards of technical papers.

**Guidelines and evaluation of Seminar in 7th semester:**

The topic of the Seminar is to be finalized and approved by the departmental committee by the end of 6<sup>th</sup> Semester. The committee shall have a convener and at least two members.

**Distribution of Marks:**

Total Marks for Seminar Evaluation = 50 marks

1)	Project Report	15 marks
2)	Presentation	25 marks
3)	Attendance	10 marks.

**Award of Marks:**

Marks Under (1) will be awarded by the Seminar In charge.

Marks Under (2) and (3) will be awarded by the Departmental committee constituted for the purpose.

**B.E. 7th Semester Examination to be held in the Year  
December 2021, 2022, 2023**

**CLASS: B.E. 7<sup>th</sup> SEMESTER**

**BRANCH :Electrical Engg./Computer Engg./Information Technology/ Mechanical Engg./  
Civil Engg.**

**COURSE NO.: ECO-711**

**CREDIT: 1**

**COURSE TITLE: MATLAB PROGRAMMING**

**Hours/ Week    Marks Distribution**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Practical</b>
<b>0</b>	<b>0</b>	<b>2</b>	<b>50</b>

**COURSE OUTCOMES**

<b>At the end of the course the student will be able to: -</b>	
<b>CO1</b>	Perform various arithmetic calculations.
<b>CO2</b>	Find importance of this software for generating equations of vectors and other mathematical expressions.
<b>CO3</b>	Articulate importance of software's in creating and printing simple, 2D & 3D plots and execution functions
<b>CO4</b>	Do various library blocks and their interconnections

**LIST OF EXPERIMENTS:**

1. Study of arithmetic, exponential, Logarithmic, Trigonometric, complex number calculation.
2. To generate equation of straight line, Geometric series, points on circle, multiply, divide and exponential vectors.
3. To create and print simple plots and execution of functions.
4. To generate matrices and vectors, array operations, inline functions anonymous functions etc.
5. To generate functions like execution a function, global variable, structures.
6. To generate 2D, 3D plots.
7. Study of various library blocks and their interconnections.

**NOTE:** Each student has to perform all the aforementioned Practical / Experiments. Additional Practical / Experiments will be performed based on the course content requirements.

**B.E . 7<sup>th</sup> semester Examination to be held in the Dec 2021, 2022, 2023, 2024**

**CLASS:B.E. 7<sup>TH</sup> SEMESTER**

**BRANCH: Electronics & Communication./Computer Engg./Information Technology/  
Mechanical Engg./ Civil Engg.**

**COURSE CODE: EEO-712**

**CREDITS: 1**

**TITLE: NON-CONVENTIONAL ENERGY RESOURCES  
AND INSTRUMENTATION LAB**

**MARKS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>PRACTICAL</b>
<b>0</b>	<b>0</b>	<b>2</b>	<b>50</b>

<b>Course Outcomes: Student will be able to</b>	
<b>CO1</b>	<b>Measure phase and frequency using CRO and Multimeter</b>
<b>CO2</b>	<b>Students will be able to understand Solar Radiation ,distillation</b>
<b>CO3</b>	<b>To study Solar Energy solar cooker ,street light and its applications</b>
<b>CO4</b>	<b>To study Fuel Cells</b>

**LIST OF PRACTICALS:**

1. To study the extension of Ammeter and voltmeter ranges.
2. To Study Block Wise Construction of Multi meters & Frequency Counter
3. To Study Block Wise Construction of Analog Oscilloscope & Function Generator.
4. To study the connection of solar panels.
5. To study overall efficiency of solar PV and battery integrated system
6. To Study of Solar Radiation by using Pyranometer.
7. To Study of Solar Distillation or Solar Still.
8. To study the constructional details of a box type solar cooker.
9. To Study of Solar Street Lighting and Lanterns.
10. To Study of Fuel cells.

**B.E . 7<sup>th</sup> Semester Examination to be held in the Year December 2021,2022,2023,2024**

**CLASS: B.E. 7<sup>th</sup> SEMESTER**

**CREDIT: 1**

**BRANCH: Electronics & Engg./Electrical Engg./Information Technology/ Mechanical Engg./ Civil Engg.**

**COURSE NO.: CSO-713**

**COURSE TITLE: PROGRAMMING LAB**

**Hours/ Week      Marks Distribution**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Practical</b>
<b>0</b>	<b>0</b>	<b>2</b>	<b>50</b>

**LABORATORY OUTCOMES**

After Completion of this course the student will be able to: -

<b>CO1</b>	Remember the role of languages like C++/ Java/Python/HTML & DHTML/Android
<b>CO2</b>	Understand the syntax and Develop the programs on specific language.
<b>CO3</b>	Implement various programs using C++/Java/Python/HTML.

**Lab Experiments:**

Experiment 1	WAP To use different arithmetic operation in java/C++/Python or use different tags in HTML.
Experiment 2	WAP to perform manipulation on strings in java / C++ / Python.
Experiment 3	WAP to demonstrate Exception handling in java / C++.
Experiment 4	Program to create frame and table using HTML
Experiment 5	Design a website on your own using HTML and CSS
Experiment 6	Develop an application representing a simple calculator
Experiment 7	Develop an application for working with notification
Experiment 8	Develop an application for connecting to internet and sending e-mail.
Experiment 9	Develop an application for working with device camera

**NOTE: Additional Lab experiments/practical will be performed based on the course requirements**

**B.E . 7<sup>th</sup> Semester Examination to be held in the Dec 2021, 2022, 2023, 20243**

**CLASS: B.E. 7<sup>th</sup> SEMESTER**

**BRANCH: Electronics & Communication/ Electrical Engg./Computer Engg./Information Technology/ Civil Engg.**

**COURSE TITLE: THEORY OF MACHINE LAB**

**Hours/ Week      Marks Distribution**

**COURSE NO.: MEO-715**

**DURATION OF EXAMINATION: 3 HOURS.**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Practical</b>
<b>0</b>	<b>0</b>	<b>2</b>	<b>50</b>

**COURSE OUTCOMES**

**At the end of the course student will be able to:**

<b>CO 1:</b>	Understand the kinematics of Quick Return Motion.
<b>CO 2:</b>	Know about gyroscopic effect.
<b>CO 3:</b>	Familiar with various cases of vibrating motion.
<b>CO 4:</b>	Describe the mechanics behind the Governors

**LIST OF EXPERIMENTS:**

1. Find displacement, velocity and acceleration of slider of the Quick-return motion mechanism.
2. To analyze the motorized gyroscope.
3. To analyze static and dynamic balancing apparatus.
4. To analyze the torsional vibration (undamped) of single rotor shaft system.
5. To analyze various types of cams and followers.
6. To analyze various types of gear trains.
7. To analyze various types of Governors with the help of stroboscope and to determine sleeve displacement, speed of Governor and corresponding radius of Governor in case of:  
i) Watt Governor ii) Porter Governor iii) Proell Governor
8. To analyze Gearbox.
9. To analyze various types of brake systems.
10. To study the phenomenon of whirling of shafts.
11. To study the Coriolis components of acceleration.

**NOTE:**

1. At least seven practicals should be performed.
2. Additional labs/ experiment will be performed based on course content requirements.
3. Simulation/ virtual labs are used to enhance the practical ability of students.

**B.E . 7<sup>th</sup> Semester Examination to be held in the Year December 2021,2022,2023,2024**

**CLASS: B.E. 7<sup>th</sup> SEMESTER**

**BRANCH: Electronics & Communication/ Electrical Engg./Computer Engg./Information Technology/Mechanical Engg.**

**COURSE TITLE: BASIC CIVIL TESTING LAB**

**COURSE NO.: CE0- 716**

**DURATION OF EXAMINATION: 3 HOURS.**

**Hours/ Week      Marks Distribution**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Practical</b>
<b>0</b>	<b>0</b>	<b>2</b>	<b>50</b>

**COURSE OUTCOMES**

**At the end of the course student will be able to:**

<b>CO 1:</b>	Perform tests on bricks and aggregates
<b>CO 2:</b>	Determine the physical properties of cement .
<b>CO 3:</b>	Determine the Workability and Compressive strength of concrete..

1. To determine water absorption and compressive strength of bricks
2. To determine the consistency and initial and final setting time of a given sample of cement using Vicat's apparatus.
3. To determine the Soundness and Compressive strength of cement.
4. To determine the fineness modulus and bulk density of fine and coarse aggregates.
5. To determine flakiness index and Impact value of coarse aggregates.
6. To determine Workability and Compressive strength of concrete
7. To determine the tensile strength of the steel.
8. To determine the Specific gravity and Atterberg limits of Soil.
9. To determine the compaction characteristics of soil by proctor's test.
10. To determine  $C_d$  for Venturimeter
11. To determine  $C_d$  for Orificemeter
12. To determine  $C_d$  for a Notch.

**B.E. Information Technology 8<sup>th</sup> Semester Examination to be held in the Year  
May 2022, 2023, 2024, 2025**

## B.E. Information Technology 8<sup>th</sup> Semester-Scheme 1

**Contact Hrs: 26**

COURSE CODE	COURSE TYPE	COURSE TITLE	LOAD ALLOCATION			MARKS DISTRIBUTION		TOTAL	CREDITS	% Change
			L	T	P	Internal	External			
ITE-801	Professional Elective Course	Elective 1	2	1	-	50	100	150	3	100%
ECO-801	Open Elective Course	Embedded Systems	2	1	-	50	100	150	3	100%
EEO-802		Non-Conventional Energy Sources & Instrumentation								
CSO-803		Web Technology								
MEO-805		Advanced Manufacturing Processes								
CEO-806		Essentials of Civil Engineering								
HOE-806		International								

NCC-804	Non-Credit Course	Disaster Management & Mitigation	2	0	0	Satisfactory/ Unsatisfactory			Non-Credit	100%
MOC-804	Massive Open Online Course	SYAWAM / NPTEL / Any other MOOC Platform	2	0	-	50	-	50	2	100%
PRJ-804	Project	Project	0	0	16	200	100	300	8	100%
<b>TOTAL</b>			<b>6</b>	<b>2</b>	<b>16</b>	<b>350</b>	<b>300</b>	<b>650</b>	<b>16</b>	
<b>Elective-I</b>										
ITE-801 (A)		Software Testing								
ITE-801(B)		Data Science								

**B.E. Information Technology 8<sup>th</sup> Semester Examination to be held in the Year  
May 2022, 2023, 2024, 2025**

**CLASS: B.E. 8<sup>th</sup> SEMESTER**

**CREDITS: 3**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE NO: ITE-801(A)**

**COURSE TITLE: SOFTWARE TESTING**

**DURATION OF EXAM: 3 HOURS**

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

**COURSE OUTCOMES**

**At the end of the course the student will be able to: -**

<b>CO1</b>	Have an ability to apply software testing knowledge and engineering methods.
<b>CO2</b>	Have an ability to design and conduct a software test process for a software testing project.
<b>CO3</b>	Have an ability to identify the needs of software test automation, and define and develop a test tool to support test automation.
<b>CO4</b>	Have an ability understand and identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods.
<b>CO5</b>	Have an ability to use software testing methods and modern software testing tools for their testing projects.

**Detailed Syllabus**

**SECTION- A**

Principles of testing Software development life cycle model: Phases of software project, Quality ,Quality assurance and quality control. Testing Verification and validation. Process models to represent various phases. Life cycle models, Software testing life cycle. (08 hours)

White Box Testing (WBT) and Black Box Testing: Static testing, Structural testing, Challenges in WBT.Black box testing process. (04 hours)

Integration Testing: Definition, As a type of testing: Top-down integration. Bottom-up integration.Bi-directional integration. System integration. Choosing integration method, As a phase of testing, Scenario testing: System scenarios. Use case scenarios. Defect bash. (06 hours)

**SECTION-B**

System and Acceptance Testing. Functionalvs non Functional .Functional system testing, on-functional sytem testing. Acceptance testing. (6 hours)

Performance testing, Regression testing, Internationalization testing, adhoc testing. Factors governing performance of testing, methodology, tools and process for performance testing.regression Testing. Introduction, Types of regression testing, Regression testing

process. Adhoc testing: Introduction, Buddy testing, pair testing, Exploratory testing. Iterative testing, Agile and Extreme testing. XP work flow. Defect seeding (08 hours)  
 Testing Object Oriented Software: Introduction. Comparison of object oriented and procedural software, System testing example. Unit testing of classes. Tools for testing object oriented software, Testing web applications. (08 hours)

<b>BOOKS RECOMMENDED:</b>		
1.	Software Testing and Practices	Srinivasan Desikan, Gopalaswamy Ramesh
2.	Introducing Software Testing	Loise Tares
3.	Software Testing Techniques	Boris Beizer

**NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.**

**B.E. Information Technology 8<sup>th</sup> Semester Examination to be held in the Year  
May 2022, 2023, 2024, 2025**

**CLASS: B.E. 8<sup>th</sup> SEMESTER**

**CREDITS:3**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE NO: ITE-801(B) (ELECTIVE 1)**

**COURSE TITLE: DATA SCIENCE**

**DURATION OF EXAM: 3 HOURS**

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

<b><u>COURSE OUTCOMES</u></b>	
<b>At the end of the course the student will be able to: -</b>	
<b>CO1</b>	To understand the need and significance of data science
<b>CO2</b>	To understand statistics and machine learning concepts that are vital for data science
<b>CO3</b>	Predict outcomes with supervised machine learning techniques.

**Detailed Syllabus**

**Section- A**

**Introduction to Data Science:**What is data science, relation to data mining, machine learning, big data and statistics, ExamplesComputing simple statistics- Means, variances, standard deviations, weighted averaging, modesSimple visualizations-Histograms, Boxplots, Scatterplots, Time series, Spatial data (6 Hours)

**Overview of Tasks & Techniques:**Prediction Models-The prediction task-Definition, Examples, Format of input / output data, training-test data, cross validation  
Prediction algorithms- Decision trees, Rule learners, Linear/logistic regression, Nearest neighbour learning. Support vector machines, Properties of prediction algorithms and practical exercises (12 Hours)

**Section- B**

**Measuring performance of a model:** Accuracy, ROC curves, precision-recall curves, Loss functions for regression, Interpretation of results- Confidence interval for accuracy, Hypothesis tests for comparing models, algorithms (6 Hours)

**Probabilistic Models:**Introduction- Probabilities, Rule of Bayes and Conditional Independence, Naïve Bayes, Bayesian Networks (5 Hours)

**Exploratory Data Mining:**Introduction to Exploratory Data Mining, Association discovery- Definition, challenges, Apriori algorithm, Clustering- Definition, Challenges (9 Hours)

<b>BOOKS RECOMMENDED:</b>		
1.	Data Science from Scratch: First principles with Python	Joel Grus
2.	An Introduction to Statistical Learning	Gareth James, Daniela Witten, Trevor Hastie, Robert Tibshirani
3.	Data Mining: Practical Machine Learning Tools and Techniques	I. Witten, E. Frank, M. Hall

**NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.**

**B.E. Information Technology 8<sup>th</sup> Semester Examination to be held in the Year  
May 2022, 2023, 2024, 2025**

**CLASS: B.E. 8<sup>th</sup> SEMESTER**

**CREDITS:3**

**BRANCH: Electrical Engg./Computer Engg./Information Technology/ Mechanical Engg./  
Civil Engg.**

**COURSE NO: ECO-801**

**COURSE TITLE: Embedded System**

**DURATION OF EXAM: 3 HOURS**

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

**COURSE OUTCOMES**

**At the end of the course the student will be able to: -**

<b>CO1</b>	Understand the concept of Microcontroller 8051, learn to write simple programs.
<b>CO2</b>	Understand the concept and applications of DC motor and indicators and use in project work.
<b>CO3</b>	Understand the concept of hardware details of ARM7.
<b>CO4</b>	Write the algorithm and design a system based on 8051.

**Detailed Syllabus**

**Section–A**

**Definition of Embedded system, macro and micro embedded systems:** Architecture of 8031/8051/8751. Comparison of Microprocessors and Microcontroller Data types and Directives. Pin description of 8051, I/O port functions, Time Delay Generation and calculation. Addressing modes, Logic instructions and programs, single bit instructions and programs, Programming using 8051 timers, counter programming, simplex, half duplex, full duplex transmission, synchronous and asynchronous communication. (16hrs)

**Section–B**

**Architecture:** Block Diagram and Pin Diagram of ARM7, Instruction Set, Addressing Modes ARM Processor. System Design based on 8051/ARM Processor. Peripheral Interfaces: LCD, Seven Segment Display, Sensor: IR, temperature. Relays, analog to digital converter, digital to analog converter interfaces with 8051 and ARM7. (14 hrs)

<b>BOOKS RECOMMENDED:</b>		
1.	The 8051 Microcontroller (architecture, Programming and Applications )	Kenneth J. Ayala -----Penram International
2.	The 8051 Microcontroller and Embedded Systems	Muhammed Ali Mazidi& Janice GillispieMazdi
3.	ARM system development guide	Andrew-n-sloss& Dominic Symes Publisher –Morgan Aausamann.

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

**B.E Examination to be held in the May 2022, 2023, 2024, 2025**

**CLASS: B.E. 8<sup>TH</sup> SEMESTER**

**CREDITS:3**

**BRANCH: E&C Engg./Computer Engg./Information Technology/ Mechanical Engg./ Civil Engg.**

**MARKS: 50**

**COURSE CODE: EEO-802**

**TITLE: NON-CONVENTIONAL ENERGY SOURCES AND INSTRUMENTATION**

**DURATION OF EXAM: 3 HOURS**

L	T	P	THEORY	SESSIONAL
3	0	0	100	50

Course Outcomes: Student will be able to	
CO1	Understand the need of energy, Various types of energy and scenario
CO2	Identify non-conventional energy as alternate form of energy and to know how it can be tapped.
CO3	Understanding various methods of measurement and instrumentation
CO4	Understanding about illumination and other lighting schemes.

**SECTION-A**

**Module 1: Introduction:** Limitations of conventional energy sources need & growth of alternate energy sources, basic schemes and applications of direct energy conversion. Photovoltaic effect, characteristics of photovoltaic cells, conversion efficiency, solar batteries and applications. Solar energy in India, solar collectors, solar furnaces & applications. Geothermal system, Characteristics of geothermal resources, choice of generators, electric equipment and precautions. Low head hydro plants, definition of low head hydro power, choice of site and turbines. Tidal energy, idea of tidal energy, Tidal electric generator, limitations. (8 hrs)

**Module 2: Wind Energy & MHD Generators:** History of wind power, wind generators, theory of wind power, characteristics of suitable wind power sites, scope in India. Basic Principles and Half effect, generator and motor effect, different types of MHD generators, conversion effectiveness. Practical MHD generators, applications and economic aspects. (5hrs)

**Module 3: Fuel Cells & Thermo-electric, Generators:** Principle of action, Gibbs free energy, general description of fuel cells, types, Construction, operational characteristics and applications. Seeback effect, peltier effect, Thomson effect, thermoelectric convertors, brief description of the construction of thermoelectric generators, applications & economic aspects. (5 hrs)

**SECTION-B**

**Module4: MEASURING INSTRUMENTS:** Classification, effects utilized in measuring instruments. Indicating instruments: Deflection, controlling and damping forces, various

dampings. Measurement of low resistance: - Potentiometer method, Kelvin double bridge. Ammeters and Voltmeters: Moving coil, moving iron ammeter and voltmeters, Errors in Ammeters and Voltmeters. (7 hrs)

**Module 5: MEASUREMENT OF POWER:** Wattmeter measurement in single phase A.C. circuits, Wattmeter errors. Measurement of three phase power by two wattmeter methods. Energy meters for A.C. circuits, Theory of Induction type meters. (5 hrs)

**Module 6: Illumination:** Nature and production of light. Photometric definitions. Incandescent lamps, arc and discharge lamps. Design of illumination schemes for indoor and outdoor uses. Flood lighting. (4 hrs)

**RECOMMENDED BOOKS:**

- |   |                           |
|---|---------------------------|
| 1. Non-conventional Energy Resources                                    | D.S. Chauhan              |
| 2. Conventional energy sources  | G.D. Rai                  |
| 3. Non-Conventional energy sources                                      | B.H. Khan                 |
| 4. Solar Energy Fundamentals and Applications                           | H.P. Garg and Jai Prakash |
| 5. A course in Electrical and Electronics Measurement & instrumentation | A.K. Sawhney              |

**NOTE:** There shall be total eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

**B.E. Information Technology Engineering 8th Semester Examination to be held in the Year  
May 2022, 2023, 2024,2025**

**CLASS: B.E. 8<sup>th</sup> SEMESTER**

**CREDITS: 3**

**BRANCH: E&C Engg./Electrical Engg./ Information Technology/ Mechanical Engg./  
Civil Engg.**

**COURSE NO: CSO-803**

**COURSE TITLE: WEB TECHNOLOGY**

**DURATION OF EXAM: 3 HOURS**

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

<u><b>COURSE OUTCOMES</b></u>	
<b>CO1</b>	Remember the role of languages like HTML, DHTML, CSS and android
<b>CO2</b>	Analyze a web page and identify its elements and attributes.
<b>CO3</b>	Implement web pages using HTML, DHTML and Cascading Style Sheets.
<b>CO4</b>	Develop Web applications using HTML/CSS/Javascript.

**Detailed Syllabus**

**Section- A**

**Introduction to WWW :-** Protocols and programs, Secure connections, Application and development tools, The web browser, What is server, Choices, Dynamic IP.

Web Design: Web site design principles, Planning the site and navigation. (6 Hours)

**Introduction to HTML:-** The development process, HTML tags and simple HTML forms, Web site structure. Introduction to XHTML: XML, Move to XHTML, Meta tags, Character entities, Frames and frame sets, Inside browser. (7 Hours)

**Style Sheets:-**Need for CSS, Introduction to CSS, Basic syntax and structure, Using CSS, Background images, Colors and properties, Manipulating texts, Using fonts, Borders and boxes, Margins, Padding lists, Positioning using CSS, CSS2. (7 Hours)

**Javascript:-**Client side scripting, What is Javascript, How to develop Javascript, Simple Javascript, variables, Functions, Conditions, Loops and repetition. (3 Hours)

**Section- B**

**Advance script:** Javascript and objects, Javascript own objects, The DOM and web browser environments, forms and validations.

**DHTML:** Combining HTML, CSS and Javascript, events and buttons, controlling your browser, Ajax: Introduction, advantages &disadvantages ,Purpose of it ,ajax based web application, alternatives of ajax. **XML:** Introduction to XML, uses of XML, simple XML, XML key components, DTD and schemas, Well formed, using XML with application XML, XSL and

XSLT, Introduction to XSL, XML transformed simple example, XSL elements, Transforming with XSLT. (7 Hours)

**PHP:-** Starting to script on server side, Arrays, Function and forms, Advance PHP.

**Databases:-** Basic command with PHP examples, Connection to server, Creating database, Selecting a database, Listing database, Listing table names, Creating a table, Inserting data, Altering tables, Queries, Deleting database, Deleting data and tables, PHP myadmin and database bugs. (10 Hours)

<b>BOOKS RECOMMENDED:</b>		
1.	“HTML Black Book”	Steven Holzner, Dremtech press.
2.	Web Technologies, Black Book.	Dreamtech Press
3.	Web Applications: Concepts and Real-World Design	Knuckles, Wiley-India
4.	Internet and World Wide Web How to program	P.J. Deitel& H.M. Deitel Pearson.

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

**B.E Examination to be held in the Year May 2022,2023,2024,2025.**

**CLASS: B.E. 8<sup>th</sup> SEMESTER**

**BRANCH: : E&C Engg./Electrical Engg./ Computer Engg./ Information Technology/ Civil Engg.**

**COURSE TITLE: ADVANCED MANUFACTURING PROCESSES**

**COURSE NO.: MEO-805**

**DURATION OF EXAMINATION: 3 HOURS.**

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

### **COURSE OUTCOMES**

**At the end of the course student will be able to:**

<b>CO 1:</b>	Understand the fundamentals of non - conventional machining processes.
<b>CO 2:</b>	Understand the working and uses of various mechanical machining processes such as AJM, USM etc.
<b>CO 3:</b>	Understand the purpose of chemical and electrochemical machining.
<b>CO 4:</b>	Understand the purpose of electric discharge machining.
<b>CO 5:</b>	Understand the fundamentals of electron beam and laser beam machining.

### **Detailed Syllabus**

#### **SECTION – A**

Introduction to Advanced Manufacturing Processes, Mechanical Processes, Abrasive Jet Technology, Ultrasonic Machining, Water Jet Machining. Fundamental principles, processes parameters, characteristics, Tool design, Metal removal rate-analysis, Part design, Analysis of the processes. Chemical and Electro-chemical machining:- Introduction, Principles & Scheme, Process parameters, Material removal rate, dynamic and hydro-dynamic & hydro-optimization, electrolytes. [17 Hours]

#### **SECTION - B**

EDM:-Introduction, basic principles & scheme, circuitry controls, material removal rate, machining accuracy, optimization, selection of tool material and tool design, Di-electric, analysis. Laser Beam Machining & Electron beam machining background, production of laser, machining by Laser and other applications, Electron beam action, Dimensionless analysis to establish correlation behavior EBM parameters.

High Velocity forming of metals, explosive forming principles and applications, Electro-hydraulic and other applications, Analysis of the process. [19 Hours]

**RECOMMENDED BOOKS:**

1. Non-traditional machining methods: ASME.
2. New Technology by Bhattacharyya; I.E. (India)
3. Ultrasonic cutting by Rozenberg; Consultants Bureau; N.Y.

**NOTE:**

1. Question paper will be of 3 Hours' duration
2. There will be 8 questions in all, four from **Section- A** (each of 20 marks) and four from **Section – B** (each of 20 marks).
3. Students are required to attempt five questions in all, at least two question from each section
4. Use of scientific calculator will be allowed in the examination hall.

**Examination to be held in the Year May 2022,2023,2024,2025**

<b>CLASS</b>	<b>8<sup>th</sup> SEMESTER</b>					
<b>BRANCH</b>	<b>E&amp;C Engg./Electrical Engg./ Computer Engg./ Information Technology/ Mechanical Engg. CREDITS: 3</b>					
<b>COURSE TITLE</b>	<b>ESSENTIALS OF CIVIL ENGINEERING</b>					
<b>COURSE NO.</b>	<b>CEO- 806</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Marks</b>	
<b>DURATION OF EXAM</b>	<b>3 HOURS</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>Theory</b>	<b>Sessional</b>
					<b>100</b>	<b>50</b>

	<b>COURSE OUTCOMES :On completion of the course the students will be able to:</b>					
<b>CO1</b>	Able to identify the properties of building materials.					
<b>CO2</b>	Acquaint with the masonry construction and finishes					
<b>CO3</b>	Carry out surveying in the field for engineering projects.					
<b>CO4</b>	Plan and schedule the Project by various network techniques of construction planning					

**Module –I**

**Brick:** Classification of bricks, constituents of good brick earth, harmful ingredients, manufacturing of bricks, testing of bricks.

**Timber:** Classification of timber, structure of timber, seasoning of timber, defects in timber and prevention of timber.

**Aggregates:** Classification of aggregates and various tests conducted on aggregates (9 Hours)

**Module -II**

**Masonry Construction Introduction:** various terms used, stone masonry-Dressing of stones, Classifications of stone masonry, safe permissible loads, Brick masonry-bonds in brick work, laying brick work, Defects in brick masonry, composite stone and brick masonry.

**Foundations:** Purpose, site exploration, Methods of Testing Bearing Capacity of Soils, Types of Foundations, Combined Footing and Raft Foundation. Pile Foundation and its types, Pile Driving, Cofferdams. (9 Hours)

### **Module -III**

Introduction to surveying, Principles of surveying, Measurement of distance. Chain Surveying, Field Equipment, Methods of Chain Surveying, Plotting from the Field Books and Degree of Accuracy, Tape corrections.

**Levelling:** Instruments used and field book recording, Methods of Levelling, height of Instrument method and Rise and Fall method, Temporary and permanent adjustments in levels.  
.

(9 Hours)

### **Module -IV**

#### **Network techniques in construction management**

Bar Charts and Mile stone charts, Elements of network, Development of network, Network rules, Network techniques CPM and PERT, Network analysis, Time estimates, Time computations, classification of activities, Determination of Slack and float, Critical Path.

(9 Hours)

#### **BOOKS RECOMMENDED:**

- |   |                 |
|---|-----------------|
| 1. BUILDING MATERIAL & CONSTRUCTION       | BY SUSHIL KUMAR |
| 2. BUILDING MATERIAL                      | BY PRABIN SINGH |
| 3. SURVEYING VOL.- I                      | BY B.C PUNMIA.  |
| 4. PERT & CPM - Principles & Applications | BY L SRINATH    |

**NOTE:** There shall be total eight questions of 20 marks each, two from each module. Five questions have to be attempted selecting at least one from each module. Use of Calculator is allowed

**Examination to be held in the Year May 2022,2023,2024,2025**

<b>CLASS</b>	<b>8<sup>th</sup> SEMESTER</b>				
<b>BRANCH</b>	<b>CSE/ECE/EE/CIVIL/MECH. Engineering</b>				<b>CREDITS: 3</b>
<b>COURSE TITLE</b>	<b>International Economics</b>				
<b>COURSE NO.</b>	<b>HOE-806</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Marks</b>
<b>DURATION OF EXAM</b>	<b>3 HOURS</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>Theory</b>
				<b>100</b>	<b>Sessional</b>
				<b>50</b>	

At the end of the course, students shall be able to:

<b>COURSE OUTCOMES</b> :On completion of the course the students will be able to:	
<b>CO1</b>	Understand the concept of international trade in general as well as with the classical and modern theories.
<b>CO2</b>	Analyze the concept of foreign exchange and foreign trade multiplier in detail and hence shall be able to understand the international market conditions.
<b>CO3</b>	Compete in international corporate world by understanding the various concepts of terms of trade like tariffs, quotas, balance of payment and international organizations, etc.

**SECTION A**

**Concept of International Trade**

Meaning, Significance and scope of International Economics, concepts of internal, interregional and international trade and their comparison, Theories of international trade: Absolute Cost Advantage, Comparative Cost Advantage, Opportunity cost theory (features, assumptions and limitations) (6 hrs)

**UNIT - II: Theories of International Trade**

Modern Theories of International Trade: General equilibrium theory, Heckscher- Ohlin Theory, Rybznski Theorem, The Stopler – Samuelson Theorem, Factor Price-Equalization Theorem. (5 hrs)

**UNIT- III: Foreign Exchange and Foreign Trade Multiplier.**

Foreign Exchange: Meaning and problems of foreign exchange, Methods of foreign payment, Demand and Supply of foreign currency, Foreign Trade-Multiplier, Exchange control (concept, features, objectives, and methods). (7hrs)

## **SECTION B**

### **Unit- IV: Terms of trade**

Meaning, Different Terms of Trade Indexes (Net Barter, Gross Barter, Income, Single and Double Factoral), Factors influencing Terms of Trade; Prebisch-Singer Thesis; Doctrine of reciprocal demand-importance and limitations . (6hrs)

### **Unit- V: Trade barriers**

Tariffs and Quotas (Meaning, classifications and their impact), theory of optimum tariff, devaluation (concept, merits, demerit and limitations) (5hrs)

### **Unit VII: Balance of payment and International organisations**

Concept and components of balance of trade and balance of payment, equilibrium and disequilibrium in BOP, consequences of disequilibrium in BOP, Various measures to correct deficit in BOP. International organisations: IMF, World bank, World Trade organisations- objectives, functions. (7hrs)

### **Suggested Readings**

1. International Economics -H.GMannur
2. International Economics -Paul R. Krugman and Maurice Obstfeld
3. International Economics - Dominick Salvatore
4. International Economics - Sodersten Bo
5. International Economics - OsShrivastva
6. International Economics - M.L. Jhingan

**NOTE:** There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of calculator is allowed.

**Semester Examination to be held in the Year May 2022, 2023, 2024, 2025**  
**CLASS: 8th SEMESTER**

**BRANCH: : E&C Engg./Electrical Engg./ Computer Engg./ Information  
Technology/Mechanical Engg.**  
**CREDITS: 0**  
**COURSE TITLE: DISASTER MANAGEMENT & MITIGATIONS**  
**CATEGORY: NCC**  
**COURSE NO. NCC-804**

**Marks**  
**L T P**  
**2 0 0 Satisfactory/Unsatisfactory**

<b><u>COURSE OUTCOMES</u></b>	
<b>At the end of the course the student will be able to: -</b>	
<b>CO1</b>	<b>Identify various types of disasters, their causes and Impacts</b>
<b>CO2</b>	<b>To understand the disaster management principles, objectives and approaches</b>
<b>CO3</b>	<b>To understand various elements of disaster management.</b>
<b>CO4</b>	<b>To study the modern techniques used in disaster mitigation and management.</b>

### **Module I**

Introduction to Disaster Management: Define and describe disaster, hazard, emergency, vulnerability, risk and disaster dimensions. Important phases of Disaster Management Cycle. Disasters classification- Natural disaster (floods, draught, cyclones, volcanoes, earthquakes, tsunami, landslides, coastal erosion, soil erosion, forest fires etc.); manmade disasters (industrial pollution, artificial flooding in urban areas, nuclear radiation, chemical spills, transportation accidents, terrorist strikes, etc.)

### **Module II**

Disaster Management: principles, objectives, and approaches. Element of disaster management; role of NGOs, community – based organizations and media; central, and state. Disaster Mitigation: Hazard assessment, Vulnerability assessment, and Risk assessment. Emergency Management Systems (EMS): Emergency medical and essential public health services, response and recovery operations, reconstruction and rehabilitation.

### **BOOKS RECOMMENDED:**

1. Disaster Management BY Harsh K Gupta
2. Disaster Management Techniques and Guidelines BY B K Singh
3. Disaster Risk Reduction in South Asia BY Pradeep Sahni
4. Disaster management, A P H Publishers BY Sharma.S.R

**NOTE: Evaluation of the course. There will be internal evaluation based on two internal sessional tests**

**B.E. Information Technology Engineering 8th Semester Examination to be held in the Year  
May 2022, 2023, 2024, 2025**

**CLASS: B.E. 8<sup>th</sup> SEMESTER**

**CREDITS: 2**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE NO: MOC-804**

**COURSE TITLE: MOOC**

Hours/ Week			Marks	
L	T	P		Sessional
2	0	0		50

The Students shall select a MOOC of duration 4 to 6 weeks available at the time on any reputed platform and shall pursue the same after due approval of the same from the departmental Committee. However, the selected MOOC course should not be similar to the regular courses offered as a part of the department curriculum.

The overall monitoring of the MOOC course will be under the supervision of the teacher Incharge of the department. The Departmental Academic Committee shall assess the student work based on a presentation of the course undertaken/ project completed along with a relevant course completion certificate.

**B.E. Information Technology Engineering 8th Semester Examination to be held in the Year  
May 2022, 2023, 2024,2025**

**CLASS: B.E. 8<sup>th</sup> SEMESTER**

**Hours/ Week**

**Marks Distribution**

**CREDITS: 8**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE NO.: PRJ-804**

**COURSE TITLE: PROJECT**

L	T	P	Internal	External	Total
0	0	16	200	100	300

**COURSE OUTCOMES**

**At the end of the course the student will be able to: -**

<b>CO1</b>	Complete their assigned project work initiated in minor project.
<b>CO2</b>	Demonstrate the project work followed by question-answer session
<b>CO3</b>	Present and submit the detailed project report.

The project will be assigned to the students towards the end of 7<sup>th</sup> semester and they will start working on those projects at the commencement of their 8<sup>th</sup> semester.

The students will submit the synopsis of their project work in the 7<sup>th</sup> semester. The Departmental Academic Committee will finalize and approve the projects. However, a departmental guide will be allotted to each project who shall periodically evaluate the student's performance during the project.

The topic of the project will be decided as per the developments taking place in the field of information technology Engineering. This may require complete literature survey, design, fabrication, simulation of some models and/or some preliminary laboratory experiments etc.

The students will have to submit a detailed project report individually to the internal guide and a copy of the certificate should also be appended to the report.

**Guidelines for evaluation of Project work in 8<sup>th</sup> semester:**

There shall be a mid-semester evaluation, followed by an End Semester (Final) Evaluation

**Sub-distribution of marks:**

1.	For External Examiner	:	100
2.	For Internal Examiner	:	200

**Sub-distribution of internal marks:**

- Out of the total 250 marks for internal evaluation, 100 marks are for mid-sem evaluation and 150 marks are for final internal evaluation
- Mark distribution of internal Project work as per the University statutes shall be based on:

	Distribution	Mid-Sem		Internal Final	
a.	Viva-Voce	15	30%	45	30%
b.	Presentation	15	30%	45	30%
c.	Report	20	40%	60	40%
		50		150	
	Total Internal	200			

**NOTE:** The students will submit a detailed project report individually to the Head of the department and a copy of the certificate if awarded should also be appended to the report.

**B.E. Information Technology 8<sup>th</sup> Semester- Scheme 2****Contact Hrs: 30**

COURSE CODE	COURSE TYPE	COURSE TITLE	LOAD ALLOCATION			MARKS DISTRIBUTION		TOTAL	CREDITS	% CHANGE
			L	T	P	Internal	External			
PII-804	Professional Industry Internship	Industry Internship	-	-	28	350	250	600	14	100%
MOC-804	Massive Open Online Course	SYAWAM / NPTEL / Any other MOOC Platform	2	0	-	50	-	50	2	100%
TOTAL			2	0	28	400	250	650	16	

**B.E. Information Technology Engineering 8th  
Semester Examination to be held in the Year**

**May 2022, 2023, 2024,2025**

**CLASS: B.E. 8<sup>th</sup> SEMESTER**

**CREDIT: 14**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE NO.: PII-804**

**COURSE TITLE: Industry Internship**

Hours/ Week			Marks Distribution		
L	T	P	Internal	External	Total
-	-	28	350	250	600

**COURSE OUTCOMES**

**At the end of the course the student will be able to: -**

<b>CO1</b>	Complete their assigned project work initiated in minor project.
<b>CO2</b>	Demonstrate the project work followed by question-answer session.
<b>CO3</b>	Present and submit the detailed project report.

The project will be assigned to the students towards the end of 7<sup>th</sup> semester and they will start working on those projects at the commencement of their 8<sup>th</sup> semester.

The students will submit the details of the company / industry where they intend to do their project work alongwith company's consent letter in the 7<sup>th</sup> semester. The Departmental Academic Committee will finalize and approve the projects. However, an internal guide will be allotted to each project who shall periodically evaluate the student's performance during the project.

The topic of the project will be decided as per the developments taking place in the field of Information Technology Engineering. This may require complete literature survey, design, fabrication, simulation of some models and/or some preliminary laboratory experiments etc.

The students will have to submit a detailed project report individually to their internal guide and a copy of the certificate if awarded should also be appended to the report. They should also submit a monthly progress of their project duly signed by the concerned authority via mail to their respective guide.

**NOTE: Students are also allowed to start their start up, provided they submit a DPR with a detailed proposal of their start up that would define their action plan and idea to the start-up cell. Only after the submitted proposal has been approved by the start-up cell will the students be allowed to work on their project.**

**Guidelines for evaluation of Project work in 8<sup>th</sup> semester:**

There shall be a mid-semester online evaluation, followed by an End Semester (Final) Evaluation

**Sub-distribution of marks:**

•	For External Examiner	:	250
•	For Internal Examiner	:	350

**Sub-distribution of internal marks:**

- Out of the total 350 marks for internal evaluation, 100 marks are for mid-sem evaluation and 250 marks are for final internal evaluation
- Mark distribution of internal Project work as per the University statutes shall be based on:

Based on:					
	Distribution	Mid-Sem		Internal Final	
a.	Viva-Voce	30	30%	75	30%
b.	Presentation	30	30%	75	30%
c.	Report	40	40%	100	40%
		100		250	
	Total Internal	350			

**B.E. Information Technology Engineering 8th Semester Examination to be held in the Year  
May 2022, 2023, 2024, 2025**

**CLASS: B.E. 8<sup>th</sup> SEMESTER**

**CREDITS: 2**

**BRANCH: INFORMATION TECHNOLOGY**

**COURSE NO: MOC-804**

**COURSE TITLE: MOOC**

Hours/ Week			Marks	
L	T	P		Sessional
2	0	0		50

The Students shall select a MOOC of duration 4 to 6 weeks, available at the time on any reputed platform and shall pursue the same after due approval of the same from the departmental Committee. However, the selected MOOC course should not be similar to the regular courses offered as a part of the department curriculum.

The overall monitoring of the MOOC course will be under the supervision of the teacher Incharge of the department. The Departmental Academic Committee shall assess the student work based on a presentation of the course undertaken/ project completed along with a relevant course completion certificate.