



# **RKDF UNIVERSITY, BHOPAL**

## **New Scheme of Examination as per AICTE Flexible Curricula**

**W.E.F. JULY 2018**

Subject wise distribution of marks

### **B.E. III Semester (Civil Engineering)**

S. No.	Subject Code	Category	Subject Name	Theory Slot						Practical Slot						Total Marks	Contact Hours per Week			
				Theory		Mid Sem		Quiz Assignment		Practical		Lab Work		Lab Quiz			L	T	P	Total Credits
				Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks					
1	CE-3011	BSC-5	Engineering Mathematics-III	70	25	20	10	10	5	-	-	-	-	-	-	100	3	1	-	4
2	CE-3021	PCC-1	Transportation – Bridges and Tunnels	70	25	20	10	10	5	-	-	-	-	-	-	100	4	-	-	4
3	CE-3031	PCC-2	Strength of Materials	70	25	20	10	10	5	30	15	10	5	10	5	150	4	-	2	6
4	CE-3041	PCC-3	Building Design and Drawing	70	25	20	10	10	5	30	15	10	5	10	5	150	4	-	2	6
5	CE-3051	HSMC-3	Value Education	70	25	20	10	10	5	30	15	10	5	10	5	150	4	-	2	6
6	CE-3061	PCC-4	Computer Programming Lab	-	-	-	-	-	-	30	15	10	5	10	5	50	-	-	2	2
7	BE-2071	DLC-1	Evaluation of Internship-I completed at I year level	-	-	-	-	-	-	30	15	10	5	10	5	50	-	-	2	2
<b>Total</b>				<b>350</b>	<b>-</b>	<b>100</b>	<b>-</b>	<b>50</b>	<b>-</b>	<b>150</b>	<b>-</b>	<b>50</b>	<b>-</b>	<b>50</b>	<b>-</b>	<b>750</b>	<b>19</b>	<b>1</b>	<b>10</b>	<b>30</b>



# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Civil Engineering)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
B.E. CE	Engineering Mathematics-III	CE - 3011

## Unit I

Fourier series: Introduction of Fourier series, Fourier series for Discontinuous functions, and Fourier series for even and odd function. Laplace Transform: Introduction of Laplace Transform, Laplace Transform of elementary functions, properties of Laplace Transform, Change of scale property, second shifting property, Laplace transform of the derivative, Inverse Laplace transform & its properties, Convolution theorem, Applications of L.T. to solve the ordinary differential equations.

## Unit II

Difference Operators, Interpolation (Newton Forward & Backward Formulae, Central Interpolation Formulae, Lagrange's and divided difference formulae), Numerical Differentiation and Numerical Integration.

## Unit III

Errors & Approximations, Solution of Algebraic & Trancedental Equations (Regula Falsi, Newton-Raphson, Iterative, Secant Method), Solution of simultaneous linear equations by Gauss Elimination, Gauss Jordan, Crout's methods , Jacobi's and Gauss-Siedel Iterative methods.

## Unit IV

Solution of Ordinary Differential Equations (Taylor's Series, Picard's Method, Modified Euler's Method, Runge-Kutta Method, Milne's Predictor & Corrector method), Correlation and Regression, Curve Fitting (Method of Least Square).

## Unit V

Concept of Probability: Probability: Binomial, Poisson's, Continuous Distribution: Normal Distribution, Testing of Hypothesis |: Students t-test, Fisher's z-test, Chi-Square Method.

### References

- (i) Higher Engineering Mathematics by BS Grewal, Khanna Publication
- (ii) Advance Engineering Mathematics by D.G.Guffy
- (iii) Mathematics for Engineers by S.Arumungam, SCITECH Publuication
- (iv) Engineering Mathematics by S S Sastri. P.H.I.
- (v) Numerical Methods for Scientific and Engg. Computation by MKJain, Iyengar and RK Jain, New Age International Publication
- (vi) Mathematical Methods by KV Suryanarayan Rao, SCITECH Publuication
- (vii) Pobability and Statistics by Ravichandran, Wiley India
- (viii) Mathematical Statistics by George R., Springer



# R.K.D.F. UNIVERSITY, BHOPAL

## B.E. (CIVIL ENGINEERING)

### SECOND YEAR

#### Semester – III

#### Course Content & Grade

Branch	Subject Title	Subject Code
CE	Transportation - Bridges and Tunnels	CE- 3021

#### Unit I

Introduction, Tractive resistances & Permanent way: Principles of Transportation, transportation by Roads, railways, Airways, Waterways, their importance and limitations, Route surveys and alignment, railway track, development and gauges, Hauling capacity and tractiveeffort.

- i) Rails: types, welding of rails, wear and tear of rails, rail creep.
- ii) Sleepers: types and comparison, requirement of a good sleeper, sleeper density.
- iii) Rail fastenings: types, Fish plates, fish bolts, spikes, bearing plates, chain keys, check and guard rails.
- iv) Ballast: Requirement of good ballast, various materials used as ballast, quantity of ballast, different methods of plate laying, material trains, calculation of materials required, relaying of track

#### Unit II

Geometric Design; Station & Yards; Points and Crossings & Signaling and interlocking:Formation, cross sections, Super elevation, Equilibrium, Cant and Cant deficiency, various curves, speed on curves. Types, locations, general equipments, layouts, marshalling yards,

Definition, layout details, design of simple turnouts, Types of signals in stations and yards, principles of signaling and inter-locking.

#### Unit-III

Bridge Site Investigation and Planning; Loading Standards &Component parts: Selection of site, alignment, collection of bridge design data: essential surveys, hydraulic design, scour, depth of bridge foundation, Economical span, clearance, afflux, type of road & railway bridges. :

Design loads and forces, Impact factor, Indian loading standards for Railways Bridges and Highway Bridges, Bridge super structure and sub-structures, abutments, piers, wing walls, return walls, approaches, floors & flooring system, choice of super structure.

#### Unit-IV

Bridge Foundations, Construction, Testing and Strengthening of Bridges : Differenttypes of foundation: piles and wells, sinking of wells, coffer-dams. Choice of bridges and choice of materials, details of construction underwater and above water, sheet piles coffer dams, Erection of bridges, girders, equipments and plants. inspection and Data collection, strengthening of bridges, Bridge failure.

#### Unit-V

Tunnels: 1. Selection of route, Engineering surveys, alignment, shape and size of tunnel,bridge action, pressure relief phenomenon, Tunnel approaches, Shafts, pilot shafts 2,Construction of tunnels in soft soil, hard soil and rock, Different types of lining, methods of lining,

Mucking operation, Drainage and ventilation, Examples of existing important tunnels in Indiaand abroad.

## References

1. Chakraborty and Das; Principles of transportation engineering; PHI
2. Rangwala SC; Railway Engineering; Charotar Publication House, Anand
3. Rangwala SC; Bridge Engineering; Charotar Publication House, Anand
4. Ponnuswamy; Bridge Engineering; TMH
5. Railway Engineering by Arora & Saxena - Dhanpat Rai & Sons
6. Railway Track by K.F. Antia
7. Principles and Practice of Bridge Engineering S.P. Bindra - Dhanpat Rai & Sons
8. Bridge Engineering - J.S. Alagia - Charotar Publication House, Anand
9. Railway, Bridges & Tunnels by Dr. S.C. Saxena



# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (CIVIL ENGINEERING)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
CE	Strength of Materials	CE- 3031

## Unit I

Simple Stress and Strains: Concept of Elastic body, stress and Strain, Hooke's law, various types of stress and strains, Elastic constants, Stresses in compound bars, composite and tapering bars, Temperature stresses. Complex Stress and Strains: Two dimensional and three dimensional stress system. Normal and tangential stresses, Principal Planes, Principal Stresses and strains, Mohr's circle of stresses, Combined Bending and Torsion, Theories of failure

## Unit II

Bending & Deflection: Theory of simple bending: Concept of pure bending and bending stress, Equation of bending. Neutral axis, Section-Modulus, Determination of bending stresses in simply supported, Cantilever and Overhanging beams subjected to point load and uniformly distributed loading. Bending & shear stress distribution across a section in Beams. Deflection of beams: Double Integration Method. Conjugate Beam Method, Macaulay's Method Area Moment Method.

## Unit III

Torsion of Shafts: Concept of pure torsion, Torsion equation, Determination of shear stress and angle of twist of shafts of circular section, Hollow shafts, Open and closed coil springs, Leaf Spring, Spiral Spring, Pressure Vessels: Thin and Thick walled cylinders and spheres. Stress due to internal pressure, Change in diameter and volume, Compound cylinders and shrink fittings.

## Unit IV

Unsymmetrical Bending: Principal moment of Inertia, Product of Inertia, Bending of a beam in a plane which is not a plane of, symmetry. Shear center; Curved beams: Pure bending of curved beams of rectangular, circular and trapezoidal sections, Stress distribution and position of neutral axis.

## Unit V

Columns and Struts: Euler's buckling load for uniform section, various end conditions, slenderness Ratio, Stress in columns, Rankine formulae, Eccentric loading on columns.

## Reference

1. Nash; Strength of Materials (Schaum), TMH.
2. Rattan SS; strength of Materials; TMH
3. Negi; Strength of materials; TMH
4. Sadhu Singh; Strength of Materials, ,
5. Ramamrutham; Strength of Materials, ,
6. Subramaniam; Strength of Materials; R; Oxford
7. National Building Code of India, Part-IV

**List of Experiments**

The experimental work to cover tension, compression, bending and impact test etc. on steel, cast iron, RCC and timber, Fire Resistant Test of Structures and Combustibility of Building Materials Test as per I.S.I. and other experiments based on the syllabus.



# R.K.D.F. UNIVERSITY, BHOPAL

## B.E. (CIVIL ENGINEERING)

### SECOND YEAR

#### Semester – III

#### Course Content & Grade

Branch	Subject Title	Subject Code
CE	Building Design & Drawing	CE- 3041

#### Unit I

Drawing of Building Elements – Drawing of various elements of buildings like various types of footing, open foundation, raft, grillage, pile and well foundation, Drawing of frames of doors, window, various types of door, window and ventilator, lintels and arches, stairs and staircase, trusses, flooring, roofs etc.

#### Unit II

Building Planning – Provisions of National Building Code, Building bye-laws, open area, set backs, FAR terminology, principle of architectural composition (i.e. unity, contrast, etc.), principles of planning, orientation.

#### Unit III

Building Services – Introduction of Building Services like water supply and drainage, electrification, ventilation and lightening and staircases, fire safety, thermal insulation, acoustics of buildings. Design and Drawing of Building – Design and preparation of detailed drawings of various types of buildings like residential building, institutional buildings and commercial buildings, detailing of doors, windows, ventilators and staircases etc.

#### Unit IV

#### **Home Vastu**

**Introduction of Vastu Science :** Effect of cosmic energy and its centralization. Vastu Purusuh, directions and use of magnetic compass

**Home Vastu Analysis :** The source of water, storage of water, exit of water, Boundary wall, Doors, Windows and Ventilators, Stairs, Garage, Room of Master Room of House, Bedroom, Study Room, Dining Room, Drawing Room, Guest Room, Worship Room, Kitchen, Toilets, Bath Rooms, Store, Verandah, Basement, the Brahmasthan.

**Home Vastu Decoration :** The Vastu of colors, Auspicious Articles of Vastu, Vastu of flowers, climbers and pictures etc.

## Unit V

### **Commercial & Industrial Vastu**

**Commercial Vastu Analysis :** Analysis of Direction of Shop or Office, Directions of door, Cabin of Chief, Reception, Direction of Sales Manager, Direction of Customer, The Worship Room, Room of Employees, Workshop, Store, Seminar Room, Guest Room, Cash Room, Kitchen, Toilets etc.

**Industrial Vastu :** Selection of land, Inspection of Plot and Surroundings, The Main Gate, The Security Room, Arrangement of Industrial Complex, Roads, Place of worship, Trees and Plants, Environment, Water Supplies, Arrangement of Utilities and Power Supplies, Pollution Control, Workshop, Store, Godown, Tank Areas, Boilers, Laboratory, Canteen , Employees Rest Rooms, Toilets, Bathrooms.

**Specific Vastu Analysis :** Vastu analysis of Hotel, Restaurant, Hospital, School, Ashram, Temple, Cities etc..

### **References**

1. Malik & Meo; Building Design and Drawing By
2. Shah, Kale & Patki; Building Design and Drawing; TMH
3. Gurucharan Singh & Jgdish Singh Building Planning, Design and Scheduling

### **List of Experiments (Expandable)**

1. Sketches of various building components.
2. One drawing sheet of various building components containing doors, windows ventilators, lintels and arches stairs foundations etc.
3. One drawing sheet each for services and interiors of buildings.
4. One drawing sheet containing detailed planning of one/two bed room residential building (common to all student)
5. One drawing sheet each of residential and institutional building (Each student perform different drawing).





**R.K.D.F. UNIVERSITY, BHOPAL**  
**B.E. (CIVIL ENGINEERING)**  
**SECOND YEAR**  
**Semester – III**  
**Course Content & Grade**

Branch	Subject Title	Subject Code
CE	VALUE EDUCATION	CE- 3051

**Chapter 1:**

**Value Education** Concepts of Values-Definition and Types of values –The need for Education in values- Challenges for Value adoption-Character development-Vision of a better world

**Chapter 2:**

**Inculcation of values** Classification of values- Personal Values-Family Values-Social Values-Spiritual values- Benefits of value adoption

**Chapter3:**

**Values for Professional excellence** Definition-Purpose-implementation-situations to adopt-reflection questions-quotable quotes of Active listening-Decision making-Determination-Perseverance-Discipline-Responsibility

**Chapter 4:**

**Business ethics** : Ethics and Entrepreneurship- Professional Ethics –Ethical choices- Resolving Ethical Dilemmas-Leadership and Social Responsibility- Corporate Social Responsibility

**Chapter 5:**

**Quality of Life** : Dealing with change-Trends, Organizations and the Individual-Self and the world-Quality from within-Relating to others-The dynamics of personal powers

**Chapter 6:**

**Exploring the self** : True Identity-Anatomy of the self-The cyclic processes within the self-States of the awareness-Innate and Acquired qualities-Empowering the self

**Chapter 7:**

**Understanding Self-Esteem:** Know self-esteem-Understanding the self-Components of self-esteem-Association with self-esteem-Levels of self-esteem-Reflection exercises

## **Chapter 8:**

**Principles of living :** Be introspective-Be an observer-Being optimistic-Appreciate differences-Don't compare yourself with others-Live at present

## **Chapter 9:**

**Practical Meditation : Why meditate?-Soul consciousness-The supreme-Karma-Timeless dimension-The eight powers**

## **Chapter 10:**

### **Exercises for Practice**

Quiet reflection- Practice introversion-Being an observer-Stand back and observe -Self awareness (Soul consciousness)-Experiencing Body free stage-Reflect on original qualities-Visualize the Divine-Think attributes of the Supreme-Developing a living relationship-Surrender to God-Create Good wishes for all-Visualization in Meditation: Orbs of Light- The forest-The Balloon



# RKDF UNIVERSITY, BHOPAL

## New Scheme of Examination as per AICTE Flexible Curricula

**W.E.F. JULY 2018**

Subject wise distribution of marks

### B.E. III Semester (Computer Science and Engineering)

S. No.	Subject Code	Category	Subject Name	Theory Slot						Practical Slot						Total Marks	Contact Hours per Week			
				Theory		Mid Sem		Quiz Assignment		Practical		Lab Work		Lab Quiz			L	T	P	Total Credits
				Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks					
1	CS-3011	BSC-5	Engineering Mathematics-III	70	25	20	10	10	5	-	-	-	-	-	-	100	3	1	-	4
2	CS-3021	PCC-1	Data Structure and Algorithms	70	25	20	10	10	5	30	15	10	5	10	5	150	4	-	2	6
3	CS-3031	PCC-2	Computer Organization and Architecture	70	25	20	10	10	5	-	-	-	-	-	-	100	4	-	-	4
4	CS-3041	PCC-3	Operating Systems	70	25	20	10	10	5	30	15	10	5	10	5	150	4	-	2	6
5	CS-3051	HSMC-3	Value Education	70	25	20	10	10	5	30	15	10	5	10	5	150	4	-	2	6
6	CS-3061	PCC-4	Software Lab-I (C++)	-	-	-	-	-	-	30	15	10	5	10	5	50	-	-	2	2
7	BE-2071	DLC-1	Evaluation of Internship-I completed at I year level	-	-	-	-	-	-	30	15	10	5	10	5	50	-	-	2	2
<b>Total</b>				<b>350</b>	<b>-</b>	<b>100</b>	<b>-</b>	<b>50</b>	<b>-</b>	<b>150</b>	<b>-</b>	<b>50</b>	<b>-</b>	<b>50</b>	<b>-</b>	<b>750</b>	<b>19</b>	<b>1</b>	<b>10</b>	<b>30</b>



# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Computer Science and Engineering)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
B.E. CSE	Engineering Mathematics-III	CS- 3011

## Unit I

Fourier series: Introduction of Fourier series, Fourier series for Discontinuous functions, and Fourier series for even and odd function. Laplace Transform: Introduction of Laplace Transform, Laplace Transform of elementary functions, properties of Laplace Transform, Change of scale property, second shifting property, Laplace transform of the derivative, Inverse Laplace transform & its properties, Convolution theorem, Applications of L.T. to solve the ordinary differential equations.

## Unit II

Difference Operators, Interpolation (Newton Forward & Backward Formulae, Central Interpolation Formulae, Lagrange's and divided difference formulae), Numerical Differentiation and Numerical Integration.

## Unit III

Errors & Approximations, Solution of Algebraic & Trancedental Equations (Regula Falsi, Newton-Raphson, Iterative, Secant Method), Solution of simultaneous linear equations by Gauss Elimination, Gauss Jordan, Crout's methods , Jacobi's and Gauss-Siedel Iterative methods.

## Unit IV

Solution of Ordinary Differential Equations (Taylor's Series, Picard's Method, Modified Euler's Method, Runge-Kutta Method, Milne's Predictor & Corrector method), Correlation and Regression, Curve Fitting (Method of Least Square).

## Unit V

Concept of Probability: Probability: Binomial, Poisson's, Continuous Distribution: Normal Distribution, Testing of Hypothesis |: Students t-test, Fisher's z-test, Chi-Square Method.

## References

- (i) Higher Engineering Mathematics by BS Grewal, Khanna Publication
- (ii) Advance Engineering Mathematics by D.G.Guffy
- (iii) Mathematics for Engineers by S.Arumungam, SCITECH Publuication
- (iv) Engineering Mathematics by S S Sastri. P.H.I.
- (v) Numerical Methods for Scientific and Engg. Computation by MKJain, Iyengar and RK Jain, New Age International Publication
- (vi) Mathematical Methods by KV Suryanarayan Rao, SCITECH Publuication
- (vii) Pobability and Statistics by Ravichandran, Wiley India
- (viii) Mathematical Statistics by George R., Springer



# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Computer Science & Engineering)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Data Structure and Algorithms	CS- 3021

## UNIT- I

Introduction: to Notions of data type, abstract data type, and data structures. Relation to the notion of classes and objects in object oriented programming. Importance of algorithms and data structures in programming. Notion of Complexity covering time complexity and space complexity. Worst case complexity, Average case complexity. Big Oh Notation. Examples of simple algorithms and illustration of their complexity. Introduction to recurrence relations. Iteration and Recursion- Problem solving using iteration and recursion with examples such as binary search, Fibonacci numbers, and Hanoi towers. Tradeoffs between iteration and recursion.

## UNIT- II

List ADT. Implementation of lists using arrays and pointers. Stack ADT. Queue ADT. Implementation of stacks and queues. Dictionaries, Hash tables: open tables and closed tables. Analysis of hashing. Skip lists and analysis.

## UNIT- III

Binary Trees- Definition and traversals: preorder, postorder, inorder. Common types and properties of binary trees. Counting of binary trees. Huffman coding using binary trees. Binary search trees : worst case analysis and average case analysis. AVL trees. Red-Black Trees, Splay trees. Priority Queues -Binary heaps: insert and delete operations and analysis. Binomial queues.

## UNIT- IV

Directed Graphs- Data structures for graph representation. Shortest path algorithms: Dijkstra (greedy algorithm) and Bellman-Ford (dynamic programming). Depth- first search and Breadth-first search. Directed acyclic graphs. Undirected Graphs- Depth-first search and breadth-first search. Minimal spanning trees and algorithms (Floyd and Kruskal) and implementation. Application to the travelling salesman problem.

## UNIT- V

Sorting- Bubblesort, selection sort, insertion sort, Shell sort; Quicksort; Heapsort; Mergesort; Radix sort; Analysis of the sorting methods. Selecting the top k elements. Lower bound on sorting.

### *Text Books:*

1. **Data Structures and Algorithms** by Alfred V. Aho, Jeffrey D. Ullman and John E. Hopcroft , Addison-Wesley Series (1983)
2. **Data Structures and Algorithm Analysis in Java (3rd Edition)** by Mark Allen Weiss, Addison Wesley, (2011).

### *Reference Books:*

1. T.H. Cormen, C.E. Leiserson, and R.L. Rivest. *Introduction to Algorithms*. The MIT Press and McGraw-Hill Book Company, Cambridge, Massachusetts, 1990 (Available in Indian Edition).
2. Steven S. Skiena. *The Algorithm Design Manual*. Springer, Second Edition, 2008.



# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Computer Science & Engineering)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Computer Organization and Architecture	CS- 3031

## UNIT I

### Basic Structure of Computers

Functional units - Basic operational concepts - Bus structures - Software performance – Memory locations and addresses – Memory operations – Instruction and instruction sequencing – Addressing modes – Assembly language – Basic I/O operations – Stacks and queues.

## UNIT II

### Arithmetic Unit

Addition and subtraction of signed numbers – Design of fast adders – Multiplication of positive numbers - Signed operand multiplication and fast multiplication – Integer division – Floating point numbers and operations.

## UNIT III

### Basic Processing Unit

Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control – Microprogrammed control - Pipelining – Basic concepts – Data hazards – Instruction hazards – Influence on Instruction sets – Data path and control consideration – Superscalar operation.

## UNIT IV

### Memory System

Basic concepts – Semiconductor RAMs - ROMs – Speed - size and cost – Cache memories - Performance consideration – Virtual memory- Memory Management requirements – Secondary storage.

## UNIT V

### I/O Organization

Accessing I/O devices – Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB).

## TEXT BOOK :

1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, 5th Edition “Computer Organization”, McGraw-Hill, 2002.

## REFERENCES :

1. William Stallings, “Computer Organization and Architecture – Designing for Performance”, 6<sup>th</sup> Edition, Pearson Education, 2003.
2. David A.Patterson and John L.Hennessy, “Computer Organization and Design: The hardware / software interface”, 2nd Edition, Morgan Kaufmann, 2002.
3. John P.Hayes, “Computer Architecture and Organization”, 3rd Edition, McGraw Hill, 1998.



# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Computer Science and Engineering)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Operating Systems	CS- 3041

## UNIT I

### INTRODUCTION

Introduction - Mainframe systems – Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real Time Systems – Handheld Systems - Hardware Protection - System Components – Operating System Services – System Calls – System Programs - Process Concept – Process Scheduling – Operations on Processes – Cooperating Processes – Inter- process Communication.

## UNIT II

### SCHEDULING

Threads – Overview – Threading issues - CPU Scheduling – Basic Concepts – Scheduling Criteria– Scheduling Algorithms – Multiple-Processor Scheduling – Real Time Scheduling - The Critical- Section Problem– Synchronization Hardware – Semaphores – Classic problems of Synchronization– Critical regions – Monitors.

## UNIT III

### DEADLOCKS

System Model – Deadlock Characterization – Methods for handling Deadlocks -Deadlock Prevention– Deadlock avoidance – Deadlock detection – Recovery from Deadlocks - Storage Management– Swapping – Contiguous Memory allocation – Paging – Segmentation – Segmentation with Paging.

## UNIT IV

### PAGING AND FILE SYSTEM

Virtual Memory – Demand Paging – Process creation – Page Replacement – Allocation of frames– Thrashing - File Concept – Access Methods – Directory Structure – File System Mounting – File Sharing – Protection

## UNIT V

### FILE MANAGEMENT

File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free-space Management. Kernel I/O Subsystems - Disk Structure – Disk Scheduling – Disk Management – Swap-Space Management. Case Study: The Linux System, Windows

### TEXT BOOK :

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, “Operating System Concepts”, Sixth Edition, John Wiley & Sons (ASIA) Pvt. Ltd, 2003.

**REFERENCES :**

1. Harvey M. Deitel, "Operating Systems", Second Edition, Pearson Education Pvt. Ltd, 2002.
2. Andrew S. Tanenbaum, "Modern Operating Systems", Prentice Hall of India Pvt. Ltd, 2003.
3. William Stallings, "Operating System", Prentice Hall of India, 4th Edition, 2003.
4. Pramod Chandra P. Bhatt – "An Introduction to Operating Systems, Concepts and Practice", PHI, 2003.

**Operating System****List of Experiment**

1. Write a program to implement FCFS CPU scheduling algorithm.
2. Write a program to implement SJF CPU scheduling algorithm.
3. Write a program to implement Priority CPU Scheduling algorithm.
4. Write a program to implement Round Robin CPU scheduling algorithm.
5. Write a program to compare various CPU Scheduling Algorithms over different Scheduling Criteria.
6. Write a program to implement classical inter process communication problem.
7. Write a program to implement classical inter process communication problem.
8. Write a program to implement classical inter process communication problem.
9. Write a program to implement & Compare various page replacement algorithm.
10. Write a program to implement & Compare various Disk & Drum scheduling Algorithms.
11. Write a program to implement Banker's algorithms.
12. Write a program to implement Remote Procedure Call(RPC).
13. Write a Devices Drivers for any Device or pheriperel.





# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Computer Science & Engineering)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Value Education	CS- 3051

## Chapter 1

**Value Education :** Concepts of Values-Definition and Types of values –The need for Education in values- Challenges for Value adoption-Character development-Vision of a better world

## Chapter 2

**Inculcation of values :** Classification of values- Personal Values-Family Values-Social Values-Spiritual values-Benefits of value adoption

## Chapter3

**Values for Professional excellence :** Definition-Purpose-implementation-situations to adopt-reflection questions-quotable quotes of Active listening-Decision making-Determination-Perseverance-Discipline-Responsibility

## Chapter 4

**Business ethics :** Ethics and Entrepreneurship- Professional Ethics –Ethical choices- Resolving Ethical Dilemmas-Leadership and Social Responsibility- Corporate Social Responsibility

## Chapter 5

**Quality of Life :** Dealing with change-Trends, Organizations and the Individual-Self and the world-Quality from within-Relating to others-The dynamics of personal powers

## Chapter 6

**Exploring the self :** True Identity-Anatomy of the self-The cyclic processes within the self-States of the awareness-Innate and Acquired qualities-Empowering the self

## Chapter 7

**Understanding Self-Esteem :** Know self-esteem-Understanding the self-Components of self-esteem-Association with self-esteem-Levels of self-esteem-Reflection exercises

## **Chapter 8**

**Principles of living :** Be introspective-Be an observer-Being optimistic-Appreciate differences-Don't compare yourself with others-Live at present

## **Chapter 9**

**Practical Meditation Why meditate?-Soul consciousness-The supreme-Karma-Timeless dimension-The eight powers**

## **Chapter 10**

**Exercises for Practice :** Quiet reflection- Practice introversion-Being an observer-Stand back and observe  
-Self awareness (Soul consciousness)-Experiencing Body free stage-Reflect on original qualities-Visualize the Divine-Think attributes of the Supreme-Developing a living relationship-Surrender to God-Create Good wishes for all-Visualization in Meditation: Orbs of Light- The forest-The Balloon



# RKDF UNIVERSITY, BHOPAL

## New Scheme of Examination as per AICTE Flexible Curricula

**W.E.F. JULY 2018**

Subject wise distribution of marks

### B.E. III Semester (Mechanical Engineering)

S. No.	Subject Code	Category	Subject Name	Theory Slot						Practical Slot						Total Marks	Contact Hours per Week			
				Theory		Mid Sem		Quiz Assignment		Practical		Lab Work		Lab Quiz			L	T	P	Total Credits
				Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks					
1	ME-3011	ESC-7	Environmental Engineering	70	25	20	10	10	5	-	-	-	-	-	-	100	4	-	-	4
2	ME-3021	PCC-1	Strength of Materials	70	25	20	10	10	5	30	15	10	5	10	5	150	4	-	2	6
3	ME-3031	PCC-2	Manufacturing Processes	70	25	20	10	10	5	-	-	-	-	-	-	100	4	-	-	4
4	ME-3041	PCC-3	Thermodynamics	70	25	20	10	10	5	30	15	10	5	10	5	150	4	-	2	6
5	ME-3051	HSMC-3	Value Education	70	25	20	10	10	5	30	15	10	5	10	5	150	4	-	2	6
6	ME-3061	PCC-4	Computer Aided Design	-	-	-	-	-	-	30	15	10	5	10	5	50	-	-	2	2
7	BE-2071	DLC-1	Evaluation of Internship-I completed at I year level	-	-	-	-	-	-	30	15	10	5	10	5	50	-	-	2	2
<b>Total</b>				<b>350</b>	<b>-</b>	<b>100</b>	<b>-</b>	<b>50</b>	<b>-</b>	<b>150</b>	<b>-</b>	<b>50</b>	<b>-</b>	<b>50</b>	<b>-</b>	<b>750</b>	<b>20</b>	<b>-</b>	<b>10</b>	<b>30</b>



# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Mechanical Engineering)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
B.E. ME	Environmental Engineering	ME- 3011

## Unit-I

**Ecosystem** – Principles of ecology, ecosystem concept: Biotic and abiotic components of ecosystem, Segments of Environment: Atmosphere, hydrosphere, Lithosphere, biosphere. Biodiversity: Threats and conservation, Food Chain.

## Unit –II

**Energy** General idea about: Natural Resources , current status and types of resources Non Renewable Sources of energy, coal, oil, Gas, Hydrogen, nuclear sources

## Unit –III

**Air Pollution & Sound Pollution - Air Pollution:** Air pollutants, classification, (Primary & secondary Pollutants) Adverse effects of pollutants. Causes of Air pollution Environmental problems, (Global warming, ozone depletion and acid rain) General idea about forest ecosystem, grassland ecosystem, wetland ecosystems and aquatic Biogeochemical Cycling: Oxygen cycle, Carbon cycle, Nitrogen cycle, Sculpture cycle and water cycle.

## Unit –IV

**Water Pollution**– Water Pollution: Pollutants in water, adverse effects. Treatment of Domestic & Industrial water effluent.

**Soil Pollution** – Soil Profile, Pollutants in soil, their adverse effects, controlling measures.

## Unit –V

**Society & Ethics** – Impact of waste on society. Solid waste management (Nuclear, Thermal, Plastic, medical, Agriculture, domestic and e-waste). Ethics and moral values, ethical situations, water preservation rain water collection. Environmental Impact Assessment.

### References:

1. Harris, CE, Prichard MS, Rabin’s MJ, “Engineering Ethics”; Cengage Pub.
2. Rana SVS ; “Essentials of Ecology and Environment”; PHI Pub.
3. Raynold, GW “Ethics in information Technology”; Cengage.
4. Svakumar; Energy Environment & Ethics in society; TMH
5. AK De “Environmental Chemistry”; New Age Int. Publ.
6. BK Sharma, “Environmental Chemistry” ; Goel Publ. House



# R.K.D.F. UNIVERSITY, BHOPAL

## B.E. (MECHANICAL ENGINEERING)

### SECOND YEAR

#### Semester – III

#### Course Content & Grade

Branch	Subject Title	Subject Code
ME	STRENGTH OF MATERIALS	ME - 3021

#### UNIT - I

**STRESS AND STRAIN:** Definition, Stress- strain, tensile & compressive stresses, shear stress-Elastic limit, Hooke's Law Poisson' Ratio, modulus of elasticity, modulus of rigidity, bulk modulus, yield stress, ultimate stress, factor of safety, state of simple shear, relation between elastic constants, Volumetric Strain, Volumetric strain for tri-axial loading, Deformation of tapering members, Deformation due to self weight, bars of varying sections, composite sections, temperature. Stress Mechanical properties of materials: Ductility, malleability, hardness, toughness, fatigue, creep; behavior of materials under tension, compression, bending, shear; ductile and brittle materials, failure of MS and CI in tension and torsion

#### UNIT - II

**COMPOUND STRESSES:** introduction, 3.2 Stress components on inclined planes, 3.3 General two-dimensional stress system, 3.4 Principal planes and stresses, 3.5 Mohr's circle of stresses. 3.6 Thin cylinders subjected to pressure, change in length, diameter and volume, 3.7 Thick cylinders - Lamé's equations (excluding compound cylinders).

#### UNIT - III

**STRESSES IN BEAMS:** Theory of pure Bending, Assumptions, Flexural formula for straight beams, moment of resistance, bending stress distribution, Section moduli for different sections, beams for uniform strength, Flitched beams, Principle axes, Principle moment of inertia Direct & Bending Stresses: Core of Section, Chimneys subjected to wind pressure **SHEAR STRESS IN BEAMS:** Distribution of shear stress, across plane sections used commonly for structural purposes, shear connectors

#### UNIT - IV

**BENDING :** pure bending, symmetric member, deformation and stress, bending of composite sections, eccentric axial loading, shear force and BM diagram, relationship among load, shear and BM, shear stresses in beams, strain energy in bending, deflection of beams, equation of elastic curve, Macaulay's method and Area moment method for deflection of beams.

#### UNIT - V

**TORSION:** Torsion of circular shafts- solid and hollow, stresses in shaft when transmitting power, shafts in sense and parallel. Torsion in shafts: stresses in a shaft, deformation in circular shaft, angle of twist, stepped-hollow, thin walled-hollow transmission shafts Leaf springs; helical springs, open and closed coil, stress in spring wire, deflection of helical spring, springs in series and parallel.



# R.K.D.F. UNIVERSITY, BHOPAL

## B.E. (MECHANICAL ENGINEERING)

### SECOND YEAR

#### Semester – III

#### Course Content & Grade

Branch	Subject Title	Subject Code
ME	MANUFACTURING PROCESSES	ME - 3031

#### UNIT - I

**Patterns and Pattern making** Introduction to Foundry - Steps involved in casting, advantages, limitations and applications of casting process. Pattern types, allowances for pattern, pattern materials, color coding and storing of patterns Moulding methods and processes-materials, equipment, Moulding sand ingredients, essential requirements, sand preparation and control, testing, cores and core making. Design considerations in casting, gating and Riser - directional solidification in castings, Metallurgical aspects of Casting

#### UNIT - II

**Casting Processes** Sand castings, pressure die casting, permanent mould casting, centrifugal casting, precision investment casting, shell Moulding, Co<sub>2</sub> Moulding, continuous casting-squeeze casting, electro slag casting, Fettling and finishing, defects in Castings, Casting of non-ferrous materials Melting, Pouring and Testing  
Melting furnaces- -crucibles oil fired furnaces-electric furnaces-cupola, selection of furnace, calculation of cupola charges-Degasification, inoculation, pouring techniques casting defects and Inspection of castings.

#### UNIT - III

**Basic Joining Processes** Types of welding-gas welding, -arc welding,-shielded metal arc welding, GTAW, GMAW, SAW, ESW-Resistance welding (spot, seam, projection, percussion, flash types)-atomic hydrogen arc welding-thermit welding, Flame cutting - Use of Oxyacetylene, modern cutting processes, arc cutting,

#### UNIT- IV

**Special Welding Processes Soldering**, brazing and braze welding and their application., welding of special materials – Stainless steel, Aluminium etc. weldability of cast iron, steel, stainless steel, aluminium alloys. Introduction to Electron beam and Laser welding.

#### UNIT - V

**Design of Weldments:** Welding symbols-Positions of welding-joint and groove design-weld stress-calculations-design of weld size, estimation of weld dilution, heat input, effect of welding parameters preheating, and post heating temperature: Selection of electrodes, flux etc. Weldments Testing and Metallurgy Inspection of welds – destructive and non-destructive testing methods, Defects in welding-causes and remedies, -effect of gases in welding-fatigue failure in Weldments.



# R.K.D.F. UNIVERSITY, BHOPAL

## B.E. (MECHANICAL ENGINEERING)

### SECOND YEAR

#### Semester – III

#### Course Content & Grade

Branch	Subject Title	Subject Code
ME	THERMODYNAMICS	ME - 3041

#### Unit - I

Basic concepts: Thermodynamics, Property, Equilibrium, State, Process, Cycle, Zeroth law of thermodynamics, statement and significance, concept of an Ideal gas, Gas laws, Avogadro's hypothesis, Heat and work transfer. First law of thermodynamics- Statement of first law of thermodynamics, first law applied to closed system, first law applied to a closed system undergoing a cycle, processes analysis of closed system, flow process, flow energy, steady flow process, Relations for flow processes, limitations of first law of thermodynamics.

#### Unit - II

Second law of thermodynamics, heat engine, heat reservoir, Refrigerator, heat pump, COP, EPR, Available energy, Carnot's theorem, Carnot's cycle, efficiency of Carnot's cycle, statement of second law Reversible and irreversible processes, consequence of second law, Entropy, Entropy change for ideal gas, T-S diagrams, Availability and Irreversibility. Gibbs and Helmholtz functions

#### Unit - III

Real gas, Deviation with ideal gas, Vander-wall's equation, evaluation of its constants, limitations of the equation. The law of corresponding states Compressibility factor, Generalized compressibility chart, P-V-T surface of a Real gas, Thermodynamics relations, Maxwell relations and there applications.

#### Unit - IV

Pure Substance, Phase, Phase-transformations, formation of steam, properties of steam, PVT surface, HS,TS,PV,PH,TV diagram, processes of vapor measurement of dryness fraction, Use of steam table and Mollier chart.

#### Unit - V

Air standard cycles, Carnot, Otto, Diesel, Dual cycles and there comparison, two stroke and four stroke engines, Brayton cycle, non reactive gas mixture, PVT relationship, mixture of ideal gases, properties of mixture of ideal gases, internal energy, Enthalpy and specific heat of gas mixtures, Enthalpy of gasmixtures.

#### References:

1. P.K.Nag; Engineering Thermodynamics; TMH
2. Van GJ; Thermodynamics; John Wylen
3. Cengel Y; Thermodynamics; TMH
4. Arora CP; Thermodynamics; TMH
5. Thermal Engineering by R Yadav
6. Engineering Thermodynamics by Omkar Singh New Age International.
7. Engineering Thermodynamics by Ratha Krishanan PHI India Pvt. Ltd.

8. Engineering Thermodynamics by M. Achuthan, PHI India.

**List of Experiments (Pl. expand it):**

1. To find mechanical equivalent of heat using Joules apparatus
  2. To study working of impulse and reaction steam turbine by models.\
  3. To study working of Gas turbines by models and to identify various processes of Brayton Cycle.
  4. To calculate COP of vapour compression refrigeration system and to plot on T-s, p-H diagrams.
  5. To plot specific fuel consumption versus rpm diagrams for diesel and petrol engines
- Theory classes must be supplemented with laboratory classes.





# R.K.D.F. UNIVERSITY, BHOPAL

## B.E. (MECHANICAL ENGINEERING)

### SECOND YEAR

#### Semester – III

#### Course Content & Grade

Branch	Subject Title	Subject Code
ME	Value Education	ME - 3051

#### Chapter 1

##### Value Education

Concepts of Values-Definition and Types of values –The need for Education in values-Challenges for Value adoption-Character development-Vision of a better world

#### Chapter 2

##### Inculcation of values

Classification of values- Personal Values-Family Values-Social Values-Spiritual values-Benefits of value adoption

#### Chapter 3

##### Values for Professional excellence

Definition-Purpose-implementation-situations to adopt-reflection questions-quotable quotes of Active listening-Decision making-Determination-Perseverance-Discipline-Responsibility

#### Chapter 4

##### Business ethics

Ethics and Entrepreneurship- Professional Ethics –Ethical choices- Resolving Ethical Dilemmas-Leadership and Social Responsibility- Corporate Social Responsibility

#### Chapter 5

##### Quality of Life

Dealing with change-Trends, Organizations and the Individual-Self and the world-Quality from within-Relating to others-The dynamics of personal powers

#### Chapter 6

##### Exploring the self

True Identity-Anatomy of the self-The cyclic processes within the self-States of the awareness-Innate and Acquired qualities-Empowering the self

#### Chapter 7

##### Understanding Self-Esteem

Know self-esteem-Understanding the self-Components of self-esteem-Association with self-esteem-Levels of self-esteem-Reflection exercises

#### Chapter 8

##### Principles of living

Be introspective-Be an observer-Being optimistic-Appreciate differences-Don't compare yourself with others-Live at present

#### Chapter 9

##### Practical Meditation

Why meditate?-Soul consciousness-The supreme-Karma-Timeless dimension-The eight powers

## **Chapter 10**

### **Exercises for Practice**

Quiet reflection- Practice introversion-Being an observer-Stand back and observe -Self awareness (Soul consciousness)-Experiencing Body free stage-Reflect on original qualities-Visualize the Divine-Think attributes of the Supreme-Developing a living relationship-Surrender to God-Create Good wishes for all-Visualization in Meditation: Orbs of Light- The forest-The Balloon

**Every chapter will have 1.Objectives 2.Introduction 9. Summary 10. Glossary and 11. Suggested Reading apart from the CONTENT as referred above**



# RKDF UNIVERSITY, BHOPAL

## New Scheme of Examination as per AICTE Flexible Curricula

**W.E.F. JULY 2018**

Subject wise distribution of marks

### B.E. III Semester (Electronics and Communication Engineering)

S. No.	Subject Code	Category	Subject Name	Theory Slot						Practical Slot						Total Marks	Contact Hours per Week			
				Theory		Mid Sem		Quiz Assignment		Practical		Lab Work		Lab Quiz			L	T	P	Total Credits
				Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks					
1	EC-3011	ESC-7	Environmental Engineering	70	25	20	10	10	5	-	-	-	-	-	-	100	4	-	-	4
2	EC-3021	PCC-1	Electronic Devices	70	25	20	10	10	5	-	-	-	-	-	-	100	4	-	-	4
3	EC-3031	PCC-2	Digital Electronics	70	25	20	10	10	5	30	15	10	5	10	5	150	4	-	2	6
4	EC-3041	PCC-3	Network Analysis	70	25	20	10	10	5	30	15	10	5	10	5	150	4	-	2	6
5	EC-3051	HSMC-3	Value Education	70	25	20	10	10	5	30	15	10	5	10	5	150	4	-	2	6
6	EC-3061	PCC-4	Software Lab-I	-	-	-	-	-	-	30	15	10	5	10	5	50	-	-	2	2
7	BE-2071	DLC-1	Evaluation of Internship-I completed at I year level	-	-	-	-	-	-	30	15	10	5	10	5	50	-	-	2	2
<b>Total</b>				<b>350</b>	<b>-</b>	<b>100</b>	<b>-</b>	<b>50</b>	<b>-</b>	<b>150</b>	<b>-</b>	<b>50</b>	<b>-</b>	<b>50</b>	<b>-</b>	<b>750</b>	<b>20</b>	<b>-</b>	<b>10</b>	<b>30</b>



# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electronics & Communication Engineering)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
B.E. EC	Environmental Engineering	EC- 3011

## Unit-I

**Ecosystem** – Principles of ecology, ecosystem concept: Biotic and biotic components of ecosystem, Segments of Environment: Atmosphere, hydrosphere, Lithosphere, biosphere. Biodiversity: Threats and conservation, Food Chain.

## Unit-II

**Energy** General idea about: Natural Resources , current status and types of resources Non Renewable Sources of energy, coal, oil, Gas, Hydrogen, nuclear sources

## Unit-III

**Air Pollution & Sound Pollution - Air Pollution:** Air pollutants, classification, (Primary & secondary Pollutants) Adverse effects of pollutants. Causes of Air pollution Environmental problems, (Global warming, ozone depletion and acid rain) General idea about forest ecosystem, grassland ecosystem, wetland ecosystems and aquatic Biogeochemical Cycling: Oxygen cycle, Carbon cycle, Nitrogen cycle, Sculpture cycle and water cycle.

## Unit-IV

**Water Pollution**– Water Pollution: Pollutants in water, adverse effects. Treatment of Domestic & Industrial water effluent.

**Soil Pollution** – Soil Profile, Pollutants in soil, their adverse effects, controlling measures.

## Unit-V

**Society & Ethics** – Impact of waste on society. Solid waste management (Nuclear, Thermal, Plastic, medical, Agriculture, domestic and e-waste). Ethics and moral values, ethical situations, water preservation rain water collection. Environmental Impact Assessment.

### References:

1. Harris, CE, Prichard MS, Rabin’s MJ, “Engineering Ethics”; Cengage Pub.
2. Rana SVS ; “Essentials of Ecology and Environment”; PHI Pub.
3. Raynold, GW “Ethics in information Technology”; Cengage.
4. Svakumar; Energy Environment & Ethics in society; TMH
5. AK De “Environmental Chemistry”; New Age Int. Publ.
6. BK Sharma, “Environmental Chemistry” ; Goel Publ. House



# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electronics & Communication Engineering)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
EC	Electronic Devices	EC - 3021

## PURPOSE

The purpose of this course is to provide a basis for understanding the characteristics, operation and limitations of semiconductor devices. This course brings together the quantum theory of solids, semiconductor material physics, and semiconductor device physics.

## INSTRUCTIONAL OBJECTIVES

1. To understand the operational characteristics of a Semiconductor in Equilibrium and Non-Equilibrium conditions.
2. To understand the working of PN junction diodes and special purpose diodes.
3. To understand the basic working physics of BJT and FET both in ideal and non-ideal conditions.

## Unit-I

**Semiconductor** intrinsic and extrinsic, p-type and n-type, energy band diagrams, majority and minority carrier, charge density in semiconductor, generation and recombination of charges, process of diffusion, diffusion and drift currents, Hall effects and its applications. p-n junction, depletion layer, potential barrier, electric field, forward and reverse biased junction, current components in p-n diode, current equation, V-I characteristics, cut in voltages of Si and Ge diode, transition and diffusion capacitance, power dissipation.

## Unit-II

**Diode Family and Applications: Diodes Family:** Characteristics and application of p-n junction diode, Zener diode, avalanche diode, Varactor diode, Schottky diode, Tunnel Diode, PIN diode, LED, photodiodes, phototransistors, p-n junction. **Applications:** diode as rectifier, clipper and clamper, The diode as a circuit element, The Load line concept, The Piecewise linear diode modal, Clipping circuits, Clipping at two independent levels, Comparators, Sampling Gate, Rectifiers, Other full wave circuits, Capacitor filter additional diodes circuits.

## Unit-III

**Bipolar junction transistor** - Construction, basic operation, current components and equations,. CB, CE and CC-configuration, input and output characteristics, Early effect, region of operation, active, cutoff and saturation region Ebers-Moll model, , power dissipation in transistor (P<sub>dmax</sub> rating), Photo transistor, Uni-junction Transistor (UJT) : Principle of operation, characteristics.

## Unit-IV

**Amplifier Basics**, Transistor as an amplifier, load line, Q-point and its selection criteria, designing of fixed bias and self-bias, stability of biasing circuits, calculation of stability factor.

**Transistor at low frequency:** frequency response, bandwidth, h-parameter analysis of CC, CB and CE configuration, simplified model, gain and impedance calculation of single stage amplifier. **Transistor at high frequency**, high frequency model (hybrid- $\pi$ ), Parameters and their definition, Miller capacitance and its effect on voltage gain.

## Unit-V

**FET construction-** Construction, n channel and p channel, characteristics, parameters, Equivalent model and voltage gain, Enhancement and depletion MOSFET and its Characteristics, analysis of FET in various configuration.

### Textbooks :

1. Boylestad and Nashelsky: Electronic Devices and Circuit Theory, Pearson Education
2. Millman and Halkias: Integrated electronics, TMH
3. Graham Bell: Electronic Devices and Circuits, PHI
4. Sendra and Smith: Microelectronics, Oxford Press.
5. Donald A Neamen: Electronic Circuits Analysis and Design, TMH

### NOTE:-

All experiments (wherever applicable) should be performed through the following steps.

**Step 1:** Circuit should be designed / drafted on paper.

**Step 2:** The designed/drafted circuit should be simulated using Simulation Software

**Step 3:** The designed/drafted circuit should be tested on the bread board and compare the results with the simulated results.

**Step 4:** The bread board circuit should be fabricated on PCB by one batch using PCB machine.

### List of Experiments (Expandable):

1. V-I characteristics of various Diodes (p-n, Zener, Varactor, Schottky, Tunnel, Photodiode etc)
2. Characteristics of Transistors (BJT and FET)
3. Study of Power electronic devices (Diac, Triac, SCR, Power MOSFET, IGBT etc).
4. Full wave rectifier with 4 diodes (Bridge rectifier).
5. Series voltage Regulator.
6. Shunt voltage Regulator.
7. Characteristics of Thermistor.



# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electronics & Communication Engineering)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
EC	Digital Electronics	EC - 3031

## PURPOSE

The purpose of this course is to develop a strong foundation in analysis and design of digital electronics.

## INSTRUCTIONAL OBJECTIVES

At the end of the course students should be able to

1. Understand concepts of combinational and sequential circuits
2. Analyze the synchronous and asynchronous logic circuits
3. Understand concepts of memory, programmable logic and digital integrated circuits.

## UNIT-I

### NUMBER SYSTEMS - BOOLEAN ALGEBRA AND LOGIC GATES

Decimal, Binary, Octal and Hexadecimal systems, conversion from one base to another, Codes-BCD, Excess-3, Gray Reflected ASCII, EBCDIC. Logic gates and binary operations-AND, OR, NOT, NAND, NOR, Exclusive-OR and Exclusive-NOR Implementations of Logic Functions using gates, NAND-NOR implementations –Multi level gate implementations-Multi output gate implementations.

Number Systems - Boolean algebra – Canonical and standard forms. Digital logic gates – Integrated circuits. Map method – four and five variable map methods –Products of Sums Simplification - Don't care conditions .Quine -McCluskey Method.

## UNIT-II

### GATE LEVEL MINIMIZATION & COMBINATIONAL LOGIC CIRCUITS

Half adder –Full Adder –Half subtractor -Full subtractor, Parallel binary adder, parallel binary Subtractor –Fast Adder - Carry Look Ahead adder–Serial. Adder/Subtractor -BCD adder –Binary Multiplier –Binary Divider -Multiplexer/De-multiplexer –decoder -encoder –parity checker –parity generators –code converters -Magnitude Comparator

## UNIT-III

### SYNCHRONOUS SEQUENTIAL LOGIC DESIGN

Building blocks like S-R, JK and Master-Slave JK FF, Edge triggered FF, Finite state machines, Design of synchronous FSM, Algorithmic State Machines charts. Designing synchronous circuits like Pulse train generator, Pseudo Random Binary Sequence generator, Clock generation

## UNIT-IV

### REGISTERS AND COUNTERS

Asynchronous Ripple or serial counter. Asynchronous Up/Down counter -Synchronous counters –Synchronous Up/Downcounters – Programmable counters –Design of Synchronous counters: state diagram-State table –State minimization –State assignment - Excitation table and maps-Circuit. Implementation -Modulo-n counter, Registers –shift registers -Universal shift registers. Shift register counters –Ring counter –Shift counters –Sequence generators

## UNIT-V

### LOGIC FAMILIES AND SEMICONDUCTOR MEMORIES

TTL NAND gate, Specifications, Noise margin, Propagation delay, fan-in, fan-out, Tristate TTL, ECL, CMOS families and their interfacing, Memory elements, Concept of Programmable logic devices like FPGA. Logic implementation using Programmable Devices.

### TEXT BOOKS

1. Morris Mano. M, “Digital Design “, Pearson education, Third Edition 2002.
2. Ronald J. Tocci, “Digital System Principles and Applications” , PHI ,Sixth Edition, 1997.

### REFERENCE BOOKS

1. Floyd, “Digital Fundamentals” , Universal Book Stall, New Delhi,1986.
2. Morris Mano. M, “Digital Design “, PHI, Second Edition.
3. Ronald J. Tocci, “Digital System Principles and Applications”, Pearson education 9th edition.

### Digital System Lab

#### INSTRUCTIONAL OBJECTIVES

1. To verify operation of logic gates and flip-flops.
2. To design and construct digital circuits

#### LIST OF EXPERIMENTS

1. Study of Gates & Flip-flops.
2. Half Adder and Full Adder.
3. Magnitude Comparator (2-Bit).
4. Encoders and Decoders.
5. Multiplexer and Demultiplexer.
6. Code Converter.
7. Synchronous Counters.
8. Ripple Counter.
9. Mod – N Counter.
10. Shift Register – SISO & SIPO.





# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electronics & Communication Engineering)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
EC	Network Analysis	EC – 3041

## UNIT-I

Introduction to circuit theory: basic circuit element R,L,C and their characteristics in terms of linearity & time dependant nature, voltage & current sources, controlled & uncontrolled sources KCL and KVL analysis, Steady state sinusoidal analysis using phasors; Concept of phasor & vector, impedance & admittance, Nodal & mesh analysis, analysis of magnetically coupled circuits. Dot convention, coupling coefficient, tuned circuits, Series & parallel resonance

## UNIT-II

Network Graph theory: Concept of Network graph, Tree, Tree branch & link, Incidence matrix, cut set and tie set matrices, dual network .

## UNIT-III

Kirchoff's voltage law, Kirchoff's current law, Voltage division and current division, Series parallel Network reduction, Superposition theorem and its application, Thevenin's and Norton's theorem and its application, Maximum power transfer theorem, Tellegen's theorem, Conservation of power, Tellegen's quasi theorem, Application of Tellegen's theorem, Millman's theorem, Substitution theorem with proof, Compensation theorem

**Network Graph Theory:** Concept of a network graph terminology used in network graph relation between twigs and links, Properties of a tree in a graph, Formation of incidence matrix, No. of trees in a graph, Cut set matrix and tie set matrix

## UNIT-IV

Transient analysis: Transients in RL, RC&RLC Circuits, initial& final conditions, time constants. Steady state analysis, Laplace transform: solution of Integro-differential equations, transform of waveform synthesized with step ramp, Gate and sinusoidal functions, Initial & final value theorem, Network Theorems in transform domain.

**Sinusoidal Steady state Analysis:** Introduction, Sinusoidal voltage and current, Element responses, The sinusoidal steady state, The sinusoidal and ejwt, Solution using ejwt, Solution using Re ejwt or Im ejwt, Phasors and phasor diagrams.

## UNIT-V

**Two port Networks:** Relationship of two port variables, Short circuit admittance parameters, open circuit impedance parameters, Transmission parameters, the hybrid parameters, Relationship between various parameters, Parallel connection of two part networks.

**Frequency Response and Resonance:** Introduction, Half power frequencies, RLC circuit series resonance, Quality factor, RLC parallel circuit parallel resonance, Practical LC parallel circuits, Series parallel conversions.

### **Books Recommended**

1. Van-Valkenberg M E “Network Analysis”, PHI, New Delhi, Third Edition (1999)
2. Van-Valkenberg M E, “Introduction to Modern Network Synthesis”, John Wiley & Sons (1999)
3. Nahvi M, Edminister J, “Scaum’s Outline of Electric Circuits (Theory and Problems)”, TMH Publication, Fourth Edition, (2002)
4. Balabanian N, Bickert Theodore A, “Linear Network Theory: Analysis, Properties, Design and Synthesis”, Matrix Publishers, First edition (1985)
5. DeCalro R A, Lin P M, “Linear Circuit Analysis”, 2nd Ed. Oxford University Press, Indian Edition (2004).

### **Analysis and Synthesis of Networks Laboratory**

1. Verification of Thevenin’s theorem, Norton’s theorem.
2. Verification of Maximum power transfer theorem, Superposition theorem.
3. Verification of Reciprocity theorem.
4. Design and implementation of T and  $\Pi$  passive filters.
5. Determination of h-parameters of a network.
6. Study of sinusoidal steady state response of a network.
7. Study of transient response of a network.
8. Study of passive integrator and differentiator.
9. Synthesis of RC-network for a given network function.
10. Verification of equivalence of star and delta transformation.



# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electronics & Communication Engineering)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
EC	Value Education	EC – 3051

## Chapter 1

**Value Education** Concepts of Values-Definition and Types of values –The need for Education in values- Challenges for Value adoption-Character development-Vision of a better world

## Chapter 2

**Inculcation of values** Classification of values- Personal Values-Family Values-Social Values-Spiritual values- Benefits of value adoption

## Chapter3

**Values for Professional excellence** Definition-Purpose-implementation-situations to adopt-reflection questions quotable quotes of Active listening-Decision making-Determination-Perseverance-Discipline-Responsibility

## Chapter 4

### Business ethics

Ethics and Entrepreneurship- Professional Ethics –Ethical choices- Resolving Ethical Dilemmas-Leadership and Social Responsibility- Corporate Social Responsibility

## Chapter 5

### Quality of Life

Dealing with change-Trends, Organizations and the Individual-Self and the world-Quality from within-Relating to others-The dynamics of personal powers

## Chapter 6

### Exploring the self

True Identity-Anatomy of the self-The cyclic processes within the self-States of the awareness-Innate and Acquired qualities-Empowering the self

## Chapter 7

### Understanding Self-Esteem

Know self-esteem-Understanding the self-Components of self-esteem-**Association with self-esteem-Levels of self-esteem-Reflection exercises**

## **Chapter 8**

### **Principles of living**

Be introspective-Be an observer-Being optimistic-Appreciate differences-Don't compare yourself with others-  
Live at present

## **Chapter 9**

### **Practical Meditation**

**Why meditate?-Soul consciousness-The supreme-Karma-Timeless dimension-The eight powers**

## **Chapter 10**

### **Exercises for Practice**

Quiet reflection- Practice introversion-Being an observer-Stand back and observe -Self awareness (Soul consciousness)-Experiencing Body free stage-Reflect on original qualities-Visualize the Divine-Think attributes of the Supreme-Developing a living relationship-Surrender to God-Create Good wishes for all-Visualization in Meditation: Orbs of Light- The forest-The Balloon



# **R.K.D.F. UNIVERSITY, BHOPAL**

**B.E. (Electronics & Communication Engineering)**

**SECOND YEAR**

**Semester – III**

**Course Content & Grade**

<b>Branch</b>	<b>Subject Title</b>	<b>Subject Code</b>
<b>EC</b>	<b>Software Lab- I</b>	<b>EC – 3061</b>

## **CIRCUIT SIMULATION/ PCB DESIGNING SOFTWARE**

**Study of circuit simulation software (any one- TINA-PRO/ PSPICE/ CIRCUIT MAKER/ GPSIM/ SAPWIN etc).**

Overview and Study of the key features and applications of the software. Application of the software in the field of Electronic Devices, Electronic Instrumentation and Network Analysis. Design, Optimization and simulation of

1. Basic Electronic circuits (examples rectifiers, clippers, clampers, diode, transistor characteristics etc).
2. Transient and steady state analysis of RL/ RC/ RLC circuits, realization of network theorems.
3. Use of virtual instruments built in the software.

### **Study of PCB layout software**

Overview and use of the software in optimization, designing and fabrication of PCB pertaining to above circuits simulated using above simulation software or other available. Students should simulate and design the PCB for atleast two circuits they are learning in the current semester.



# RKDF UNIVERSITY, BHOPAL

## New Scheme of Examination as per AICTE Flexible Curricula

**W.E.F. JULY 2018**

Subject wise distribution of marks

### B.E. III Semester (Electrical Engineering)

S. No.	Subject Code	Category	Subject Name	Theory Slot						Practical Slot						Total Marks	Contact Hours per Week			
				Theory		Mid Sem		Quiz Assignment		Practical		Lab Work		Lab Quiz			L	T	P	Total Credits
				Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks					
1	EE-3011	ESC-7	Environmental Engineering	70	25	20	10	10	5	-	-	-	-	-	-	100	4	-	-	4
2	EE-3021	PCC-1	Electromagnetic Fields	70	25	20	10	10	5	-	-	-	-	-	-	100	4	-	-	4
3	EE-3031	PCC-2	Semiconductor Devices and Circuits	70	25	20	10	10	5	30	15	10	5	10	5	150	4	-	2	6
4	EE-3041	PCC-3	Network Analysis	70	25	20	10	10	5	30	15	10	5	10	5	150	4	-	2	6
5	EE-3051	HSMC-3	Value Education	70	25	20	10	10	5	30	15	10	5	10	5	150	4	-	2	6
6	EE-3061	PCC-4	Electrical Workshop	-	-	-	-	-	-	30	15	10	5	10	5	50	-	-	2	2
7	BE-2071	DLC-1	Evaluation of Internship-I completed at I year level	-	-	-	-	-	-	30	15	10	5	10	5	50	-	-	2	2
<b>Total</b>				<b>350</b>	<b>-</b>	<b>100</b>	<b>-</b>	<b>50</b>	<b>-</b>	<b>150</b>	<b>-</b>	<b>50</b>	<b>-</b>	<b>50</b>	<b>-</b>	<b>750</b>	<b>20</b>	<b>-</b>	<b>10</b>	<b>30</b>



# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electrical Engineering)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
B.E. EE	Environmental Engineering	EE- 3011

## Unit-I

**Ecosystem** – Principles of ecology, ecosystem concept: Biotic and biotic components of ecosystem, Segments of Environment: Atmosphere, hydrosphere, Lithosphere, biosphere. Biodiversity: Threats and conservation, Food Chain.

## Unit –II

**Energy** General idea about: Natural Resources , current status and types of resources Non Renewable Sources of energy, coal, oil, Gas, Hydrogen, nuclear sources

## Unit –III

**Air Pollution & Sound Pollution - Air Pollution:** Air pollutants, classification, (Primary & secondary Pollutants) Adverse effects of pollutants. Causes of Air pollution Environmental problems, (Global warming, ozone depletion and acid rain) General idea about forest ecosystem, grassland ecosystem, wetland ecosystems and aquatic Biogeochemical Cycling: Oxygen cycle, Carbon cycle, Nitrogen cycle, Sculpture cycle and water cycle.

## Unit –IV

**Water Pollution**– Water Pollution: Pollutants in water, adverse effects. Treatment of Domestic & Industrial water effluent.

**Soil Pollution** – Soil Profile, Pollutants in soil, their adverse effects, controlling measures.

## Unit –V

**Society & Ethics** – Impact of waste on society. Solid waste management (Nuclear, Thermal, Plastic, medical, Agriculture, domestic and e-waste). Ethics and moral values, ethical situations, water preservation rain water collection. Environmental Impact Assessment.

### References:

1. Harris, CE, Prichard MS, Rabin’s MJ, “Engineering Ethics”; Cengage Pub.
2. Rana SVS ; “Essentials of Ecology and Environment”; PHI Pub.
3. Raynold, GW “Ethics in information Technology”; Cengage.
4. Svakumar; Energy Environment & Ethics in society; TMH
5. AK De “Environmental Chemistry”; New Age Int. Publ.
6. BK Sharma, “Environmental Chemistry” ; Goel Publ. House



# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electrical Engineering)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
EE	Electromagnetic Fields	EE - 3021

## UNIT I

### **STATIC ELECTRIC FIELDS**

Cartesian, cylindrical & spherical co-ordinate systems, scalar & vector fields, gradient, divergence & curl of a vector field, Divergence theorem & Stokes's theorem, concept of vectors. Coulomb's law – Electric field intensity – Field due to different types of charges – Stream lines and sketches of fields – Electric flux density – Gauss law and its application to symmetrical charge distributions – Gauss law applied to differential volume element – Concept of divergence – electric potential – Potential field due to different types of charges – Potential gradient – the dipole – field due to dipole – Energy density in electrostatic field.

## UNIT II

### **CONDUCTORS, DIELECTRICS AND CAPACITANCE**

Laplace's & Poisson's equations, solution of Laplace's equation, Electric dipole, dipole moment, potential & electric field intensity due to dipole, Behavior of conductors in an electric field. Conductor & insulator, electric field inside a dielectric, polarization, Boundary value conditions for electric Field, Capacitance & Capacitances of various types of capacitors, Energy stored and energy density in static electric field, Current density, conduction & convection current density ohms law in point form, equation of continuity.

## UNIT III

### **STEADY MAGNETIC FIELDS**

Static Magnetic Field, Biot-Savart's law, Magnetic Field intensity due to straight current carrying filament, circular, square and solenoid current carrying wire, Relationship between magnetic flux, flux density & magnetic Field intensity; Ampere's circuital law and its applications, magnetic Field intensity due to infinite sheet and various other configurations, Ampere's circuital law in point form, Magnetic force, moving charge in a magnetic field, Lorentz Force on straight and long current carrying conductors in magnetic field, force between two long & parallel current carrying conductors. Magnetic dipole & dipole moment, a differential current loop as dipole, torque on a current carrying loop in magnetic field, Magnetic Boundary conditions.

## UNIT IV

### **MAXWELLS EQUATIONS AND SCALAR, VECTOR PROPERTIES**

Faraday's Law, transformer & motional EMFs, Displacement current, Maxwell's equations as Generalization of circuit equations, Maxwell's equation in free space, Maxwell's equation for harmonically varying Field, static and steady fields, Maxwell's equations in differential & integral form. Scalar magnetic potential and its limitations, Vector magnetic potential and its properties, vector



magnetic potential due to different simple configurations; Self and Mutual inductances, determination of self & mutual inductances, self inductance of solenoid, toroid coils, mutual inductance between a straight long wire & a square loop. Energy stored in magnetic Field & energy density,

## UNIT V

### **ELECTRO MAGNETIC WAVES**

Uniform plane wave in time domain in free space, Sinusoidally time varying uniform plane wave in free space, Wave equation and solution for material medium, Uniform plane wave in dielectrics and conductors, Pointing Vector theorem, instantaneous, average and complex poynting vector, power loss in a plane conductor, energy storage, Polarization of waves, Reflection by conductors and dielectric – Normal & Oblique incidence, Reflection at surface of a conducting medium, surface impedance, transmission line analogy.

### **References:**

1. Mathew N.O Sadiku; Elements of Electromagnetic; Oxford.
2. P.V. Gupta; Electromagnetic Fields; Dhanpat Rai.
3. N.N. Rao; Element of Engineering Electromagnetic; PHI.
4. William H. Hayt; Engineering Electromagnetic; TMH.
5. John D. Kraus; Electromagnetic; TMH.
6. Jordan Balmian; Electromagnetic wave & Radiating System; PHI.



# **R.K.D.F. UNIVERSITY, BHOPAL**

**B.E. (Electrical Engineering)**

**SECOND YEAR**

**Semester – III**

**Course Content & Grade**

<b>Branch</b>	<b>Subject Title</b>	<b>Subject Code</b>
<b>EE</b>	<b>Electrical Measurement and Measuring Instruments</b>	<b>EE- 3031</b>

## **UNIT I**

### **MEASUREMENT OF R,L,C**

Functional elements of an instrument – static and dynamic characteristics – Errors in measurement. Measurement of R, L, C – Wheatstone, Kelvin’s double, Maxwell, Anderson and Schering bridges. Measurement of high resistance – Megger – loss of charge method.

## **UNIT II**

### **MEASURING INSTRUMENTS**

Principle of operation and construction of PMMC, MI, Dynamometer, Induction, Thermal and Rectifier type instruments – Measurement of voltage and current – use of ammeter shunts and voltmeter multiplier – Use of CT and PT for extending instrument ranges.

## **UNIT III**

### **MEASUREMENT OF POWER AND ENERGY**

Dynamometer type wattmeter – induction type energymeter- 1 phase & 3 phase – errors and compensation – energymeter calibration by direct and phantom loading – Maximum demand indicator – Measurement of reactive power – Trivector meter.

## **UNIT IV**

### **MEASUREMENT OF FREQUENCY,POWER FACTOR AND PHASE SEQUENCE**

Frequency meters – Powerfactor meter - 1 phase & 3 phase – Synchroscope – Phase sequence indicator. Magnetic tape recorders – Stripchart recorder – X-Y recorder – Cathode Ray Oscilloscope – block diagram – CRT – Dual Trace oscilloscope.

## **UNIT V**

### **ELECTRONIC INSTRUMENTS**

Electronic voltmeters – Digital voltmeter – Multimeter – Signal generator – Function generator. Classification of transducers – resistive, capacitive and inductive – piezoelectric transducer – strain gauges – LVDT – thermoelectric – piezoelectric. Transducers for measurement of displacement – temperature – pressure – velocity.

**TEXT BOOKS**

1. Golding, EW. & Widdies, FW. *Measurements & Measuring instruments*, Sir Issar Pitman & sons (P)Ltd. 1998.
2. A.K. Sawhney; *Electrical & Electronic Measurements & Instrument*; Dhanpat Rai & Sons Pub.
3. Albert D Half ride & William D Cooper, *Modern Electronic instrumentation and measurement techniques*, Prentice Hall of India Pvt Ltd. 1998.

**LIST OF EXPERIMENTS (EXPANDABLE):**

1. Measurement of low resistance using Kelvin's Double bridge
2. Measurement of medium resistance using Wheatstone's bridge
3. Measurement of high resistance by loss of charge method
4. Measurement of Insulation resistance using Megger
5. Measurement of earth resistance by fall of potential method and verification by using earth tester
6. Measurement of power in a single phase ac circuit by 3 voltmeter/ 3 Ammeter method
7. Calibration of a dynamometer type of wattmeter with respect to a standard/Sub Standard wattmeter
8. Calibration of a induction type single phase energy meter
9. Calibration of a dynamometer type of wattmeter by Phantom Loading method.



# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electrical Engineering)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
EE	Network Analysis	EE - 3041

## UNIT I

Introduction to LLBP circuit elements R,L,C and their characteristics in terms of Linearity & time dependent nature, KCL and KVL analysis dual networks analysis of magnetically coupled circuits Dot convention, coupling co-efficient, Tuned circuits. Series & parallel resonance voltage & current sources, controlled sources.

## UNIT II

Network topology, concept of Network graph, Tree, Tree branch & link, Incidence matrix, cut set and tie set matrices. Network Theorems – Thevenins & Norton's theorem, superposition, reciprocity, compensation, maximum power transfer and Millman's theorem, problems with controlled sources.

## UNIT III

Transient analysis Transients in RL, RC & RLC Circuits initial conditions, time constants. Network driven by constant driving sources & their solutions. Steady state analysis - Concept of phasor & vector, impedance & admittance. Node & mesh analysis of RL,RC and RLC networks with sinusoidal and other driving sources.

## UNIT IV

Frequency domain analysis – Laplace transform solution of Integro differential equations. Transform of Waveform – synthesized with step ramp, Gate and sinusoidal functions. Initial & final value theorem. Network Theorems in transform domain. Concept of signal spectra, Fourier series co-efficient of a periodic waveform. Waveform symmetries. Trigonometric and Exponential form of Fourier series, steady state response to periodic signals.

## UNIT V

Network function & Two port networks – concept of complex frequency, port. Network functions of one port & two ports, poles and zeros network of different kinds. Two port parameters – Z,Y, chain parameters relationship between parameters. Interconnection of two ports. Terminated two port network.

### References:

1. M.E. Van Valkenburg, Network Analysis, (PHI)
2. F.F.Kuo, Network Analysis.
3. Mittal GK; Network Analysis; Khanna Publisher
4. Mesereau and Jackson; Circuit Analysis- A system Approach; Pearson.
5. Sudhakar & Pillai; Circuit & Networks- Analysis and Synthesis; TMH
6. Hayt W.H. & J.E. Kemmerly; Engineering Circuit Analysis; TMH

7. Decarlo lin; Linear circuit Analysis; Oxford
8. William D Stanley : Network Analysis with Applications, Pearson Education
9. Roy Choudhary D; Network and systems; New Age Pub
10. Charles K. Alexander & Matthew N.O. Sadiku: Electrical Circuits :TMH
11. Chakraborti :Circuit theory: Dhanpat Rai
12. B.Chattopadhyay & P.C.Rakshit; Fundamental of Electrical circuit theory; S Chand
13. Nilson & Riedel , Electric circuits ;Pearson

**List of experiments (Expandable):**

1. To Verify Thevenin Theorem.
2. To Verify Superposition Theorem.
3. To Verify Reciprocity Theorem.
4. To Verify Maximum Power Transfer Theorem.
5. To Verify Millman's Theorem.



# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electrical Engineering)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
EE	Value Education	EE - 3051

Concepts of Values-Definition and Types of values –The need for Education in values-Challenges for Value adoption-Character development-Vision of a better world

## Chapter 2

### **Inculcation of values**

Classification of values- Personal Values-Family Values-Social Values-Spiritual values-Benefits of value adoption

## Chapter 3

### **Values for Professional excellence**

Definition-Purpose-implementation-situations to adopt-reflection questions-quotable quotes of Active listening-Decision making-Determination-Perseverance-Discipline-Responsibility

## Chapter 4

### **Business ethics**

Ethics and Entrepreneurship- Professional Ethics –Ethical choices- Resolving Ethical Dilemmas-Leadership and Social Responsibility- Corporate Social Responsibility

## Chapter 5

**Quality of Life** Dealing with change-Trends, Organizations and the Individual-Self and the world-Quality from within-Relating to others-The dynamics of personal powers

## Chapter 6

**Exploring the self** True Identity-Anatomy of the self-The cyclic processes within the self-States of the awareness-Innate and Acquired qualities-Empowering the self

## Chapter 7

### **Understanding Self-Esteem**

Know self-esteem-Understanding the self-Components of self-esteem-**Association with self-esteem-Levels of self-esteem-Reflection exercises**

## Chapter 8

### **Principles of living**

Be introspective-Be an observer-Being optimistic-Appreciate differences-Don't compare yourself with others-Live at present

## **Chapter 9**

### **Practical Meditation**

**Why meditate?-Soul consciousness-The supreme-Karma-Timeless dimension-The eight powers**

## **Chapter 10**

### **Exercises for Practice**

Quiet reflection- Practice introversion-Being an observer-Stand back and observe -Self awareness (Soul consciousness)-Experiencing Body free stage-Reflect on original qualities-Visualize the Divine-Think attributes of the Supreme-Developing a living relationship-Surrender to God-Create Good wishes for all-Visualization in Meditation: Orbs of Light- The forest-The Balloon.



# RKDF UNIVERSITY, BHOPAL

## New Scheme of Examination as per AICTE Flexible Curricula

**W.E.F. JULY 2018**

Subject wise distribution of marks

### B.E. III Semester (Electrical and Electronics Engineering)

S. No.	Subject Code	Category	Subject Name	Theory Slot						Practical Slot						Total Marks	Contact Hours per Week			
				Theory		Mid Sem		Quiz Assignment		Practical		Lab Work		Lab Quiz			L	T	P	Total Credits
				Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks					
1	EX-3011	ESC-7	Environmental Engineering	70	25	20	10	10	5	-	-	-	-	-	-	100	4	-	-	4
2	EX-3021	PCC-1	Electromagnetic Fields	70	25	20	10	10	5	-	-	-	-	-	-	100	4	-	-	4
3	EX-3031	PCC-2	Electrical Measurement and Measuring Instruments	70	25	20	10	10	5	30	15	10	5	10	5	150	4	-	2	6
4	EX-3041	PCC-3	Network Analysis	70	25	20	10	10	5	30	15	10	5	10	5	150	4	-	2	6
5	EX-3051	HSMC-3	Value Education	70	25	20	10	10	5	30	15	10	5	10	5	150	4	-	2	6
6	EX-3061	PCC-4	Electrical Workshop	-	-	-	-	-	-	30	15	10	5	10	5	50	-	-	2	2
7	BE-2071	DLC-1	Evaluation of Internship-I completed at I year level	-	-	-	-	-	-	30	15	10	5	10	5	50	-	-	2	2
<b>Total</b>				<b>350</b>	<b>-</b>	<b>100</b>	<b>-</b>	<b>50</b>	<b>-</b>	<b>150</b>	<b>-</b>	<b>50</b>	<b>-</b>	<b>50</b>	<b>-</b>	<b>750</b>	<b>20</b>	<b>-</b>	<b>10</b>	<b>30</b>





# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electrical and Electronics Engineering)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
B.E. EEE	Environmental Engineering	EX- 3011

## Unit-I

**Ecosystem** – Principles of ecology, ecosystem concept: Biotic and biotic components of ecosystem, Segments of Environment: Atmosphere, hydrosphere, Lithosphere, biosphere. Biodiversity: Threats and conservation, Food Chain.

## Unit –II

**Energy** General idea about: Natural Resources , current status and types of resources Non Renewable Sources of energy, coal, oil, Gas, Hydrogen, nuclear sources

## Unit –III

**Air Pollution & Sound Pollution - Air Pollution:** Air pollutants, classification, (Primary & secondary Pollutants) Adverse effects of pollutants. Causes of Air pollution Environmental problems, (Global warming, ozone depletion and acid rain) General idea about forest ecosystem, grassland ecosystem, wetland ecosystems and aquatic Biogeochemical Cycling: Oxygen cycle, Carbon cycle, Nitrogen cycle, Sculpture cycle and water cycle.

## Unit –IV

**Water Pollution**– Water Pollution: Pollutants in water, adverse effects. Treatment of Domestic & Industrial water effluent.

**Soil Pollution** – Soil Profile, Pollutants in soil, their adverse effects, controlling measures.

## Unit –V

**Society & Ethics** – Impact of waste on society. Solid waste management (Nuclear, Thermal, Plastic, medical, Agriculture, domestic and e-waste). Ethics and moral values, ethical situations, water preservation rain water collection. Environmental Impact Assessment.

### References:

1. Harris, CE, Prichard MS, Rabin’s MJ, “Engineering Ethics”; Cengage Pub.
2. Rana SVS ; “Essentials of Ecology and Environment”; PHI Pub.
3. Raynold, GW “Ethics in information Technology”; Cengage.
4. Svakumar; Energy Environment & Ethics in society; TMH
5. AK De “Environmental Chemistry”; New Age Int. Publ.
6. BK Sharma, “Environmental Chemistry” ; Goel Publ. House



# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electrical and Electronics Engineering)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
EEE	Electromagnetic Fields	EX - 3021

## UNIT I

### **STATIC ELECTRIC FIELDS**

Cartesian, cylindrical & spherical co-ordinate systems, scalar & vector fields, gradient, divergence & curl of a vector field, Divergence theorem & Stokes's theorem, concept of vectors. Coulomb's law – Electric field intensity – Field due to different types of charges – Stream lines and sketches of fields – Electric flux density – Gauss law and its application to symmetrical charge distributions – Gauss law applied to differential volume element – Concept of divergence – electric potential – Potential field due to different types of charges – Potential gradient – the dipole – field due to dipole – Energy density in electrostatic field.

## UNIT II

### **CONDUCTORS, DIELECTRICS AND CAPACITANCE**

Laplace's & Poisson's equations, solution of Laplace's equation, Electric dipole, dipole moment, potential & electric field intensity due to dipole, Behavior of conductors in an electric field. Conductor & insulator, electric field inside a dielectric, polarization, Boundary value conditions for electric Field, Capacitance & Capacitances of various types of capacitors, Energy stored and energy density in static electric field, Current density, conduction & convection current density ohms law in point form, equation of continuity.

## UNIT III

### **STEADY MAGNETIC FIELDS**

Static Magnetic Field, Biot-Savart's law, Magnetic Field intensity due to straight current carrying filament, circular, square and solenoid current carrying wire, Relationship between magnetic flux, flux density & magnetic Field intensity; Ampere's circuital law and its applications, magnetic Field intensity due to infinite sheet and various other configurations, Ampere's circuital law in point form, Magnetic force, moving charge in a magnetic field, Lorentz Force on straight and long current carrying conductors in magnetic field, force between two long & parallel current carrying conductors. Magnetic dipole & dipole moment, a differential current loop as dipole, torque on a current carrying loop in magnetic field, Magnetic Boundary conditions.

## UNIT IV

### **MAXWELLS EQUATIONS AND SCALAR, VECTOR PROPERTIES**

Faraday's Law, transformer & motional EMFs, Displacement current, Maxwell's equations as Generalization of circuit equations, Maxwell's equation in free space, Maxwell's equation for harmonically varying Field, static and steady fields, Maxwell's equations in differential & integral form. Scalar magnetic potential and its limitations, Vector magnetic potential and its properties, vector

magnetic potential due to different simple configurations; Self and Mutual inductances, determination of self & mutual inductances, self inductance of solenoid, toroid coils, mutual inductance between a straight long wire & a square loop. Energy stored in magnetic Field & energy density,

## UNIT V

### **ELECTRO MAGNETIC WAVES**

Uniform plane wave in time domain in free space, Sinusoidally time varying uniform plane wave in free space, Wave equation and solution for material medium, Uniform plane wave in dielectrics and conductors, Pointing Vector theorem, instantaneous, average and complex poynting vector, power loss in a plane conductor, energy storage, Polarization of waves, Reflection by conductors and dielectric – Normal & Oblique incidence, Reflection at surface of a conducting medium, surface impedance, transmission line analogy.

### **References:**

1. Mathew N.O Sadiku; Elements of Electromagnetic; Oxford.
2. P.V. Gupta; Electromagnetic Fields; Dhanpat Rai.
3. N.N. Rao; Element of Engineering Electromagnetic; PHI.
4. William H. Hayt; Engineering Electromagnetic; TMH.
5. John D. Kraus; Electromagnetic; TMH.
6. Jordan Balmian; Electromagnetic wave & Radiating System; PHI.



# **R.K.D.F. UNIVERSITY, BHOPAL**

**B.E. (Electrical and Electronics Engineering)**

**SECOND YEAR**

**Semester – III**

**Course Content & Grade**

<b>Branch</b>	<b>Subject Title</b>	<b>Subject Code</b>
<b>EEE</b>	<b>Electrical Measurement and Measuring Instruments</b>	<b>EX- 3031</b>

## **UNIT I**

### **MEASUREMENT OF R,L,C**

Functional elements of an instrument – static and dynamic characteristics – Errors in measurement. Measurement of R, L, C – Wheatstone, Kelvin’s double, Maxwell, Anderson and Schering bridges. Measurement of high resistance – Megger – loss of charge method.

## **UNIT II**

### **MEASURING INSTRUMENTS**

Principle of operation and construction of PMMC, MI, Dynamometer, Induction, Thermal and Rectifier type instruments – Measurement of voltage and current – use of ammeter shunts and voltmeter multiplier – Use of CT and PT for extending instrument ranges.

## **UNIT III**

### **MEASUREMENT OF POWER AND ENERGY**

Dynamometer type wattmeter – induction type energymeter- 1 phase & 3 phase – errors and compensation – energymeter calibration by direct and phantom loading – Maximum demand indicator – Measurement of reactive power – Trivector meter.

## **UNIT IV**

### **MEASUREMENT OF FREQUENCY,POWER FACTOR AND PHASE SEQUENCE**

Frequency meters – Powerfactor meter - 1 phase & 3 phase – Synchroscope – Phase sequence indicator. Magnetic tape recorders – Stripchart recorder – X-Y recorder – Cathode Ray Oscilloscope – block diagram – CRT – Dual Trace oscilloscope.

## **UNIT V**

### **ELECTRONIC INSTRUMENTS**

Electronic voltmeters – Digital voltmeter – Multimeter – Signal generator – Function generator. Classification of transducers – resistive, capacitive and inductive – piezoelectric transducer – strain gauges – LVDT – thermoelectric – piezoelectric. Transducers for measurement of displacement – temperature – pressure – velocity.

**TEXT BOOKS**

1. Golding, EW. & Widdies, FW. *Measurements & Measuring instruments*, Sir Issar Pitman & sons (P)Ltd. 1998.
2. A.K. Sawhney; *Electrical & Electronic Measurements & Instrument*; Dhanpat Rai & Sons Pub.
3. Albert D Half ride & William D Cooper, *Modern Electronic instrumentation and measurement techniques*, Prentice Hall of India Pvt Ltd. 1998.

**LIST OF EXPERIMENTS (EXPANDABLE):**

1. Measurement of low resistance using Kelvin's Double bridge
2. Measurement of medium resistance using Wheatstone's bridge
3. Measurement of high resistance by loss of charge method
4. Measurement of Insulation resistance using Megger
5. Measurement of earth resistance by fall of potential method and verification by using earth tester
6. Measurement of power in a single phase ac circuit by 3 voltmeter/ 3 Ammeter method
7. Calibration of a dynamometer type of wattmeter with respect to a standard/Sub Standard wattmeter
8. Calibration of a induction type single phase energy meter
9. Calibration of a dynamometer type of wattmeter by Phantom Loading method.



# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electrical and Electronics Engineering)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
EEE	Network Analysis	EX - 3041

## UNIT I

Introduction to LLBP circuit elements R,L,C and their characteristics in terms of Linearity & time dependent nature, KCL and KVL analysis dual networks analysis of magnetically coupled circuits Dot convention, coupling co-efficient, Tuned circuits. Series & parallel resonance voltage & current sources, controlled sources.

## UNIT II

Network topology, concept of Network graph, Tree, Tree branch & link, Incidence matrix, cut set and tie set matrices. Network Theorems – Thevenins & Norton's theorem, superposition, reciprocity, compensation, maximum power transfer and Millman's theorem, problems with controlled sources.

## UNIT III

Transient analysis Transients in RL, RC & RLC Circuits initial conditions, time constants. Network driven by constant driving sources & their solutions. Steady state analysis - Concept of phasor & vector, impedance & admittance. Node & mesh analysis of RL,RC and RLC networks with sinusoidal and other driving sources.

## UNIT IV

Frequency domain analysis – Laplace transform solution of Integro differential equations. Transform of Waveform – synthesized with step ramp, Gate and sinusoidal functions. Initial & final value theorem. Network Theorems in transform domain. Concept of signal spectra, Fourier series co-efficient of a periodic waveform. Waveform symmetries. Trigonometric and Exponential form of Fourier series, steady state response to periodic signals.

## UNIT V

Network function & Two port networks – concept of complex frequency, port. Network functions of one port & two ports, poles and zeros network of different kinds. Two port parameters – Z,Y, chain parameters relationship between parameters. Interconnection of two ports. Terminated two port network.

### References:

1. M.E. Van Valkenburg, Network Analysis, (PHI)
2. F.F.Kuo, Network Analysis.
3. Mittal GK; Network Analysis; Khanna Publisher
4. Mesereau and Jackson; Circuit Analysis- A system Approach; Pearson.
5. Sudhakar & Pillai; Circuit & Networks- Analysis and Synthesis; TMH
6. Hayt W.H. & J.E. Kemmerly; Engineering Circuit Analysis; TMH

7. Decarlo lin; Linear circuit Analysis; Oxford
8. William D Stanley : Network Analysis with Applications, Pearson Education
9. Roy Choudhary D; Network and systems; New Age Pub
10. Charles K. Alexander & Matthew N.O. Sadiku: Electrical Circuits :TMH
11. Chakraborti :Circuit theory: Dhanpat Rai
12. B.Chattopadhyay & P.C.Rakshit; Fundamental of Electrical circuit theory; S Chand
13. Nilson & Riedel , Electric circuits ;Pearson

**List of experiments (Expandable):**

1. To Verify Thevenin Theorem.
2. To Verify Superposition Theorem.
3. To Verify Reciprocity Theorem.
4. To Verify Maximum Power Transfer Theorem.
5. To Verify Millman's Theorem.



# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electrical and Electronics Engineering)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
EEE	Value Education	EX - 3051

Concepts of Values-Definition and Types of values –The need for Education in values-Challenges for Value adoption-Character development-Vision of a better world

## Chapter 2

### **Inculcation of values**

Classification of values- Personal Values-Family Values-Social Values-Spiritual values-Benefits of value adoption

## Chapter 3

### **Values for Professional excellence**

Definition-Purpose-implementation-situations to adopt-reflection questions-quotable quotes of Active listening-Decision making-Determination-Perseverance-Discipline-Responsibility

## Chapter 4

### **Business ethics**

Ethics and Entrepreneurship- Professional Ethics –Ethical choices- Resolving Ethical Dilemmas-Leadership and Social Responsibility- Corporate Social Responsibility

## Chapter 5

**Quality of Life** Dealing with change-Trends, Organizations and the Individual-Self and the world-Quality from within-Relating to others-The dynamics of personal powers

## Chapter 6

**Exploring the self** True Identity-Anatomy of the self-The cyclic processes within the self-States of the awareness-Innate and Acquired qualities-Empowering the self

## Chapter 7

### **Understanding Self-Esteem**

Know self-esteem-Understanding the self-Components of self-esteem-**Association with self-esteem-Levels of self-esteem-Reflection exercises**

## Chapter 8

### **Principles of living**

Be introspective-Be an observer-Being optimistic-Appreciate differences-Don't compare yourself with others-Live at present



## **Chapter 9**

### **Practical Meditation**

**Why meditate?-Soul consciousness-The supreme-Karma-Timeless dimension-The eight powers**

## **Chapter 10**

### **Exercises for Practice**

Quiet reflection- Practice introversion-Being an observer-Stand back and observe -Self awareness (Soul consciousness)-Experiencing Body free stage-Reflect on original qualities-Visualize the Divine-Think attributes of the Supreme-Developing a living relationship-Surrender to God-Create Good wishes for all-Visualization in Meditation: Orbs of Light- The forest-The Balloon.



# RKDF UNIVERSITY, BHOPAL

## New Scheme of Examination as per AICTE Flexible Curricula

**W.E.F. JULY 2018**

Subject wise distribution of marks

### B.E. III Semester (Information Technology)

S. No.	Subject Code	Category	Subject Name	Theory Slot						Practical Slot						Total Marks	Contact Hours per Week			
				Theory		Mid Sem		Quiz Assignment		Practical		Lab Work		Lab Quiz			L	T	P	Total Credits
				Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks					
1	IT-3011	BSC-5	Engineering Mathematics-III	70	25	20	10	10	5	-	-	-	-	-	-	100	3	1	-	4
2	IT-3021	PCC-1	Data Structure and Algorithms	70	25	20	10	10	5	30	15	10	5	10	5	150	4	-	2	6
3	IT-3031	PCC-2	Computer Organization and Architecture	70	25	20	10	10	5	-	-	-	-	-	-	100	4	-	-	4
4	IT-3041	PCC-3	Operating Systems	70	25	20	10	10	5	30	15	10	5	10	5	150	4	-	2	6
5	IT-3051	HSMC-3	Value Education	70	25	20	10	10	5	30	15	10	5	10	5	150	4	-	2	6
6	IT-3061	PCC-4	Software Lab-I (C++)	-	-	-	-	-	-	30	15	10	5	10	5	50	-	-	2	2
7	BE-2071	DLC-1	Evaluation of Internship-I completed at I year level	-	-	-	-	-	-	30	15	10	5	10	5	50	-	-	2	2
<b>Total</b>				<b>350</b>	<b>-</b>	<b>100</b>	<b>-</b>	<b>50</b>	<b>-</b>	<b>150</b>	<b>-</b>	<b>50</b>	<b>-</b>	<b>50</b>	<b>-</b>	<b>750</b>	<b>19</b>	<b>1</b>	<b>10</b>	<b>30</b>



# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Information Technology)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
B.E. IT	Engineering Mathematics-III	IT- 3011

## Unit I

Fourier series: Introduction of Fourier series, Fourier series for Discontinuous functions, and Fourier series for even and odd function. Laplace Transform: Introduction of Laplace Transform, Laplace Transform of elementary functions, properties of Laplace Transform, Change of scale property, second shifting property, Laplace transform of the derivative, Inverse Laplace transform & its properties, Convolution theorem, Applications of L.T. to solve the ordinary differential equations.

## Unit II

Difference Operators, Interpolation (Newton Forward & Backward Formulae, Central Interpolation Formulae, Lagrange's and divided difference formulae), Numerical Differentiation and Numerical Integration.

## Unit III

Errors & Approximations, Solution of Algebraic & Trancedental Equations (Regula Falsi, Newton-Raphson, Iterative, Secant Method), Solution of simultaneous linear equations by Gauss Elimination, Gauss Jordan, Crout's methods , Jacobi's and Gauss-Siedel Iterative methods.

## Unit IV

Solution of Ordinary Differential Equations (Taylor's Series, Picard's Method, Modified Euler's Method, Runge-Kutta Method, Milne's Predictor & Corrector method), Correlation and Regression, Curve Fitting (Method of Least Square).

## Unit V

Concept of Probability: Probability: Binomial, Poisson's, Continuous Distribution: Normal Distribution, Testing of Hypothesis |: Students t-test, Fisher's z-test, Chi-Square Method.

### References

- (i) Higher Engineering Mathematics by BS Grewal, Khanna Publication
- (ii) Advance Engineering Mathematics by D.G.Guffy
- (iii) Mathematics for Engineers by S.Arumungam, SCITECH Publuication
- (iv) Engineering Mathematics by S S Sastri. P.H.I.
- (v) Numerical Methods for Scientific and Engg. Computation by MKJain, Iyengar and RK Jain, New Age International Publication
- (vi) Mathematical Methods by KV Suryanarayan Rao, SCITECH Publuication
- (vii) Pobability and Statistics by Ravichandran, Wiley India
- (viii) Mathematical Statistics by George R., Springer



# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Information Technology)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
IT	Data Structure and Algorithms	IT- 3021

## UNIT- I

Introduction: to Notions of data type, abstract data type, and data structures. Relation to the notion of classes and objects in object oriented programming. Importance of algorithms and data structures in programming. Notion of Complexity covering time complexity and space complexity. Worst case complexity, Average case complexity. Big Oh Notation. Examples of simple algorithms and illustration of their complexity. Introduction to recurrence relations. Iteration and Recursion- Problem solving using iteration and recursion with examples such as binary search, Fibonacci numbers, and Hanoi towers. Tradeoffs between iteration and recursion.

## UNIT- II

List ADT. Implementation of lists using arrays and pointers. Stack ADT. Queue ADT. Implementation of stacks and queues. Dictionaries, Hash tables: open tables and closed tables. Analysis of hashing. Skip lists and analysis.

## UNIT- III

Binary Trees- Definition and traversals: preorder, postorder, inorder. Common types and properties of binary trees. Counting of binary trees. Huffman coding using binary trees. Binary search trees : worst case analysis and average case analysis. AVL trees. Red-Black Trees, Splay trees. Priority Queues -Binary heaps: insert and delete operations and analysis. Binomial queues.

## UNIT- IV

Directed Graphs- Data structures for graph representation. Shortest path algorithms: Dijkstra (greedy algorithm) and Bellman-Ford (dynamic programming). Depth- first search and Breadth-first search. Directed acyclic graphs. Undirected Graphs- Depth-first search and breadth-first search. Minimal spanning trees and algorithms (Floyd and Kruskal) and implementation. Application to the travelling salesman problem.

## UNIT- V

Sorting- Bubblesort, selection sort, insertion sort, Shell sort; Quicksort; Heapsort; Mergesort; Radix sort; Analysis of the sorting methods. Selecting the top k elements. Lower bound on sorting.

### *Text Books:*

1. **Data Structures and Algorithms by Alfred V. Aho, Jeffrey D. Ullman and John E. Hopcroft , Addison-Wesley Series (1983)**
2. **Data Structures and Algorithm Analysis in Java (3rd Edition) by Mark Allen Weiss, Addison Wesley, (2011).**

### *Reference Books:*

1. **T.H. Cormen, C.E. Leiserson, and R.L. Rivest. *Introduction to Algorithms*. The MIT Press and McGraw-Hill Book Company, Cambridge, Massachusetts, 1990 (Available in Indian Edition).**
2. **Steven S. Skiena. *The Algorithm Design Manual*. Springer, Second Edition, 2008.**



# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Information Technology)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
IT	Computer Organization and Architecture	IT- 3031

## UNIT I

### Basic Structure of Computers

Functional units - Basic operational concepts - Bus structures - Software performance – Memory locations and addresses – Memory operations – Instruction and instruction sequencing – Addressing modes – Assembly language – Basic I/O operations – Stacks and queues.

## UNIT II

### Arithmetic Unit

Addition and subtraction of signed numbers – Design of fast adders – Multiplication of positive numbers - Signed operand multiplication and fast multiplication – Integer division – Floating point numbers and operations.

## UNIT III

### Basic Processing Unit

Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control – Microprogrammed control - Pipelining – Basic concepts – Data hazards – Instruction hazards – Influence on Instruction sets – Data path and control consideration – Superscalar operation.

## UNIT IV

### Memory System

Basic concepts – Semiconductor RAMs - ROMs – Speed - size and cost – Cache memories - Performance consideration – Virtual memory- Memory Management requirements – Secondary storage.

## UNIT V

### I/O Organization

Accessing I/O devices – Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB).

## TEXT BOOK :

1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, 5th Edition “Computer Organization”, McGraw-Hill, 2002.

## REFERENCES :

1. William Stallings, “Computer Organization and Architecture – Designing for Performance”, 6<sup>th</sup> Edition, Pearson Education, 2003.
2. David A.Patterson and John L.Hennessy, “Computer Organization and Design: The hardware / software interface”, 2nd Edition, Morgan Kaufmann, 2002.
3. John P.Hayes, “Computer Architecture and Organization”, 3rd Edition, McGraw Hill, 1998.



# R.K.D.F. UNIVERSITY, BHOPAL

## B.E. (MECHANICAL ENGINEERING)

### SECOND YEAR

#### Semester – III

#### Course Content & Grade

Branch	Subject Title	Subject Code
ME	THERMODYNAMICS	ME - 3041

#### Unit - I

Basic concepts: Thermodynamics, Property, Equilibrium, State, Process, Cycle, Zeroth law of thermodynamics, statement and significance, concept of an Ideal gas, Gas laws, Avogadro's hypothesis, Heat and work transfer. First law of thermodynamics- Statement of first law of thermodynamics, first law applied to closed system, first law applied to a closed system undergoing a cycle, processes analysis of closed system, flow process, flow energy, steady flow process, Relations for flow processes, limitations of first law of thermodynamics.

#### Unit - II

Second law of thermodynamics, heat engine, heat reservoir, Refrigerator, heat pump, COP, EPR, Available energy, Carnot's theorem, Carnot's cycle, efficiency of Carnot's cycle, statement of second law Reversible and irreversible processes, consequence of second law, Entropy, Entropy change for ideal gas, T-S diagrams, Availability and Irreversibility. Gibbs and Helmholtz functions

#### Unit - III

Real gas, Deviation with ideal gas, Vander-wall's equation, evaluation of its constants, limitations of the equation. The law of corresponding states Compressibility factor, Generalized compressibility chart, P-V-T surface of a Real gas, Thermodynamics relations, Maxwell relations and there applications.

#### Unit - IV

Pure Substance, Phase, Phase-transformations, formation of steam, properties of steam, PVT surface, HS,TS,PV,PH,TV diagram, processes of vapor measurement of dryness fraction, Use of steam table and Mollier chart.

#### Unit - V

Air standard cycles, Carnot, Otto, Diesel, Dual cycles and there comparison, two stroke and four stroke engines, Brayton cycle, non reactive gas mixture, PVT relationship, mixture of ideal gases, properties of mixture of ideal gases, internal energy, Enthalpy and specific heat of gas mixtures, Enthalpy of gasmixtures.

#### References:

1. P.K.Nag; Engineering Thermodynamics; TMH
2. Van GJ; Thermodynamics; John Wylen
3. Cengel Y; Thermodynamics; TMH
4. Arora CP; Thermodynamics; TMH
5. Thermal Engineering by R Yadav
6. Engineering Thermodynamics by Omkar Singh New Age International.
7. Engineering Thermodynamics by Ratha Krishanan PHI India Pvt. Ltd.

8. Engineering Thermodynamics by M. Achuthan, PHI India.

**List of Experiments (Pl. expand it):**

1. To find mechanical equivalent of heat using Joules apparatus
  2. To study working of impulse and reaction steam turbine by models.\
  3. To study working of Gas turbines by models and to identify various processes of Brayton Cycle.
  4. To calculate COP of vapour compression refrigeration system and to plot on T-s, p-H diagrams.
  5. To plot specific fuel consumption versus rpm diagrams for diesel and petrol engines
- Theory classes must be supplemented with laboratory classes.



# R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Information Technology)

SECOND YEAR

Semester – III

Course Content & Grade

Branch	Subject Title	Subject Code
IT	Value Education	IT- 3051

## Chapter 1

**Value Education :** Concepts of Values-Definition and Types of values –The need for Education in values-Challenges for Value adoption-Character development-Vision of a better world

## Chapter 2

**Inculcation of values :** Classification of values- Personal Values-Family Values-Social Values-Spiritual values-Benefits of value adoption

## Chapter3

**Values for Professional excellence :** Definition-Purpose-implementation-situations to adopt-reflection questions-quotable quotes of Active listening-Decision making-Determination-Perseverance-Discipline-Responsibility

## Chapter 4

**Business ethics :** Ethics and Entrepreneurship- Professional Ethics –Ethical choices- Resolving Ethical Dilemmas-Leadership and Social Responsibility- Corporate Social Responsibility

## Chapter 5

**Quality of Life :** Dealing with change-Trends, Organizations and the Individual-Self and the world-Quality from within-Relating to others-The dynamics of personal powers

## Chapter 6

**Exploring the self :** True Identity-Anatomy of the self-The cyclic processes within the self-States of the awareness-Innate and Acquired qualities-Empowering the self

## Chapter 7

**Understanding Self-Esteem :** Know self-esteem-Understanding the self-Components of self-esteem-Association with self-esteem-Levels of self-esteem-Reflection exercises



## **Chapter 8**

**Principles of living :** Be introspective-Be an observer-Being optimistic-Appreciate differences-Don't compare yourself with others-Live at present

## **Chapter 9**

**Practical Meditation Why meditate?-Soul consciousness-The supreme-Karma-Timeless dimension-The eight powers**

## **Chapter 10**

**Exercises for Practice :** Quiet reflection- Practice introversion-Being an observer-Stand back and observe  
-Self awareness (Soul consciousness)-Experiencing Body free stage-Reflect on original qualities-Visualize the Divine-Think attributes of the Supreme-Developing a living relationship-Surrender to God-Create Good wishes for all-Visualization in Meditation: Orbs of Light- The forest-The Balloon