SRI VASAVI ENGINEERING COLLEGE (Autonomous)

Pedatadepalli, Tadepalligudem – 534 101.

Third Meeting of the Academic Council was held on **02/06/2019 at 10:30 A.M**. in the Conference Hall of Sri Vasavi Engineering College.

Members Present:

1.	Dr.Guduru VNSR Ratnakara Rao	Principal & Chairman
2.	Prof. R. Srinivasa Rao,DE, JNTUK	Member
3.	Prof.P.Siva Pullaiah, Pro-Vice Chancellor, GITAM	Member
4.	Prof.B.V.S.S.S. Prasad, IIT Madras	Member
5.	Prof.S.R.K.Reddy, Gudlavelleru Engg.College	Member
6.	Sri B.V.Raghavaiah, Director (Retd.), CPRI, Bhopal	Member
7.	Dr. N.S.C. Babu, Executive Director, SETS	Member
8.	Dr.D.Sudha Rani, HOD, EEE	Member
9.	Dr.M.V.Ramesh, HOD, ME	Member
10.	Dr.E.Kusuma Kumari, HOD, ECE	Member
11.	Dr.D.Jaya Kumari, HOD, CSE	Member
12.	Dr.G.V.Subba Raju, HOD, MBA	Member
13.	Sri.N.Rajasekhar, HOD, BS&H	Member
14.	Dr.J.Srihari Rao, Director	Member
15.	Dr.V.V.Hanumantha Rao, Section Head, English	Member
16.	Sri P.Sita Rama Raju, Section Head, Physics	Member
17.	Sri J.Chandra Rao, Section Head, Chemistry	Member
18.	Sri.K.N.H.Srinivas, Assoc.Prof., ECE	Member
19.	Dr.Rama Rao P.V.V., Dean R&D	Member
20.	Sri.G.Radha Krishnan, HOD I/c, CE	Invited Member
21.	Sri V. Kiran Kumar, COE	Invited Member
22.	Dr. T. Sujani, Head Training	Invited Member
23.	Dr.Ch.Rambabu, Dean (SA)	Member Secretary

Members absent

1.	Dr. V.V. Subba Rao, Registrar JNTUK	Member
2.	Dr. A. Mallikarjuna Prasad, DAP JNTUK	Member
3.	Sri Lokam Prasad, CEO, Miracle Software Systems	Member

Minutes of the Third Academic Council Meeting held on 02/06/2019

Venue: Conference Hall

Item No.1: Welcome address by Principal& Introduction of members.

Principal Prof. Guduru VNSR Ratnakara Rao welcomed the members and chaired the meeting.

Item No.2: To approve Action taken report on the minutes of the previous meeting held on 01.07.2018.

The Council approved and the same is given in Annexure-I **(Page No.3)**

Item No.3: To approve of the minutes of the meeting of BOS of various departments:

a. Minutes of the 2nd meeting of the BOS of Mathematics (dated: 13.04.2019). [Details are given in Annexure-II **(Page No.9)]**
b. Minutes of the 2nd meeting of the BOS of **E**lectronics & **C**ommunication **E**ngineering **(ECE)** (dated: 13.04.2019). [Details are given in Annexure-III **(Page No.12)]**
c. Minutes of the 2nd meeting of the BOS of MBA (dated: 16.04.2019). [Details are given in Annexure-IV **(Page No.44)]**
d. Minutes of the 2nd meeting of the BOS of English (dated: 19.04.2019). [Details are given in Annexure-V **(Page No.106)]**
e. Minutes of the 2nd meeting of the BOS of **C**ivil **E**ngineering (**CE**) (dated: 20.04.2019). [Details are given in Annexure-VI **(Page No.116)]**
f. Minutes of the 2nd meeting of the BOS of **E**lectrical & **E**lectronics **E**ngineering (**EEE**) (dated: 20.04.2019). [Details are given in Annexure-VII **(Page No.149)]**
g. Minutes of the 2nd meeting of the BOS of **C**omputer **S**cience & **E**ngineering (**CSE**) (dated: 20.04.2019). [Details are given in Annexure-VIII **(Page No.172)]**
h. Minutes of the 2nd meeting of the BOS of **M**echanical **E**ngineering (**ME**) (dated: 21.04.2019). [Details are given in Annexure-IX **(Page No.219)]**

The Council approved minutes of the meeting of BOS of various departments.

Item No.4: Any other item with the permission of the Chair

i) The proposed B.Tech, MBA III & IV Semester Academic Calendar was also presented and it was approved by the council. [Details are given in Annexure-X **(Page No.250)]**

ii) Conditions for Promotion of Lateral Entry Students [Details are given in Annexure-XI **(Page No.253)]**

Annexure-I

Minutes of the Second Academic Council Meeting held on 01/07/2018

Item No.1: Welcome address by Principal& Introduction of members.

Principal Dr.Guduru.V.N.S.R Ratnakara Rao welcomed the members and chaired the meeting.

Item No.2: Approval of the minutes of the previous meeting

Minutes of the 1st meeting which were already circulated to members are approved.

Item No.3: To approve the Rules & Regulations to the award of degree

Detailed rules and regulations for the award of B.Tech degrees offered by Sri Vasavi Engineering College (Autonomous) were presented. After deliberations with minor changes the rules and regulations are approved. These are applicable for the batch of students admitted in Academic Year 2018-19 and onwards.

Item No.4: To approve the common course structure for different branches of B.Tech program.

The common course structures for different branches during the I and II semesters of the B.Tech programme are presented.

Item No.5: To approve the syllabi for different courses offered in I and II semester of B.Tech Programme.

Syllabus for different courses along with course outcomes, number of contact hours, number of credits and the prescribed textbooks as recommended by BOS concerned are presented.

Item No.6: To approve the course structures of II, III & IV years of different B.Tech programmes.

Tentative course structures for II, III & IV years of B.Tech programmes are presented.

These will be approved after further discussion in the next meeting.

Item No.7: To approve the rules and regulations pertaining to the award of M.Tech degrees offered by the college

The regulations pertaining to the M.Tech programme are presented.

Item No.8: To approve the course structure and syllabi for M.Tech programme offered by the college

Detailed course structures along with syllabi as recommended by BOS concerned for the different M.Tech programmes offered by the college namely

i. M.Tech (Structural Engineering)
ii. M.Tech (Power System Control and Automation)
iii. M.Tech (Machine Design)
iv. M.Tech (VLSI & Embedded Systems)
v. M.Tech (Computer Science &Engineering)

are presented.

Item No.9: To approve the Rules and Regulations pertaining to the award of MBA programme offered by the college

Council resolved that the regulations will be at far with those for M.Tech programme except for minor difference in arriving at the internal marks for the theory courses and in project evaluation.

Item No.10: To approve the course structure and syllabi for the MBA programme

Detailed course structure along with syllabi as recommended by BOS concerned is presented.

Item No.11: Any other item

The tentative academic schedule for the 1st year of B.Tech programme under autonomy is presented.

Meeting concluded with vote of thanks by the Member Secretary.

The Academic Rules & Regulations approved by the council were followed for the academic Year 2018-19.

- **Details of Academic Calendar:**

S.No	Content	B.Tech	M.Tech	MBA
1.	Commencement of Class work for I Sem	03/08/2018	13/08/2018	13/08/2018
2.	End of Class work for I Sem	29/11/2018	18/12/2018	06/12/2018
3.	Commencement of Class work for II Sem	02/01/2019	21/01/2019	07/01/2019
4.	End of Class work for II Sem	02/05/2019	18/05/2019	08/05/2019

- **Details of student attendance for I & II Sem of U.G & P.G:**

S.No	Content	B.Tech		M.Tech		MBA	
		I Sem	II Sem	I Sem	II Sem	I Sem	II Sem
1.	<65% (Detained)	12	5	1	Nil	3	1
2.	65-74.99%	18	28	2	Nil	3	7
3.	>75%	565	550	23	25	55	50

- **Details of Student attendance for II, III, IV B.Tech I & II Semester for the A.Y. 2018-19:**

S.No	Content	II B.Tech		III B.Tech		IV B.Tech	
		I Sem	II Sem	I Sem	II Sem	I Sem	II Sem
1.	<65% (Detained)	16	8	10	8	4	1
2.	65-74.99%	70	92	45	54	57	76
3.	>75%	668	637	715	698	704	684

- **Details of Placements for the A.Y 2018-19:**

  No. of Companies: **45**

  No. of Students Placed: **450**

- **Details of Internships for the A.Y. 2018-19:**

  No. of Students gone for Internships: **114**

Results

B.Tech I Semester Result:

S. No.	Branch & Section	Appeared	Passed	Failed	Pass %
1.	CE	42	28	14	66.67
2.	EEE	46	38	8	82.61
3.	ME-A	42	17	25	40.48
4.	ME-B	38	32	6	84.21
5.	ECE-A	59	32	27	54.24
6.	ECE-B	59	50	9	84.75
7.	ECE-C	60	55	5	91.67
8.	CSE-A	58	27	31	46.55
9.	CSE-B	60	59	1	98.33
10.	CSE-C	59	55	4	93.22
11.	CSE-D	60	57	3	95.00
Overall		**583**	**450**	**133**	**77.18**

MBA I Semester Result:

S.No	Programme	Appeared	Passed	Failed	Pass %
1	MBA	58	43	15	**74.14%**

M.Tech I Semester Result:

S.No	Specialization	Appeared	Passed	Failed	Pass %
1.	STE	7	6	1	85.71
2.	PSCA	3	3	0	100
3.	MD	9	7	2	77.77
4.	VLSI&ES	1	1	0	100
5.	CSE	5	5	0	100
6.	**Overall**	**25**	**22**	**3**	**88.00%**

II B.Tech I Semester Result:

S. No.	Branch & Section	Appeared	Passed	Failed	Pass %
1.	CE	70	27	43	38.57
2.	EEE-A	35	13	22	37.14
3.	EEE-B	38	15	23	39.47
4.	EEE-C	58	29	29	50.00
5.	ME-A	64	22	42	34.38
6.	ME-B	61	29	32	47.54
7.	ECE-A	68	28	40	41.18
8.	ECE-B	66	30	36	45.45
9.	ECE-C	65	33	32	50.77
10	CSE-A	55	33	22	60.00
11	CSE-B	54	31	23	57.41
12	CSE-C	55	28	27	50.91
13	CSE-D	50	25	25	50.00
Overall		**739**	**343**	**396**	**46.41%**

III B.Tech I Semester Result:

S. No.	Branch & Section	Appeared	Passed	Failed	Pass%
1.	CE	65	28	37	43.08
2.	EEE-A	61	30	31	49.18
3.	EEE-B	59	28	31	47.46
4.	ME-A	69	26	43	37.68
5.	ME-B	71	20	51	28.17
6.	ECE-A	72	42	30	58.33
7.	ECE-B	66	35	31	53.03
8.	ECE-C	61	30	31	49.18
9.	CSE-A	62	53	9	85.48
10.	CSE-B	60	47	13	78.33
11.	CSE-C	52	40	12	76.92
12.	CSE-D	61	48	13	78.69
Overall		**759**	**427**	**332**	**56.25%**

IV B.Tech I Semester Result:

S. No.	Branch & Section	Appeared	Passed	Failed	Pass %
1.	CE	70	61	9	87.14
2.	EEE-A	59	47	12	79.66
3.	EEE-B	61	54	7	88.52
4.	ME-A	67	39	28	58.21
5.	ME-B	59	41	18	69.49
6.	ECE-A	67	37	30	55.22
7.	ECE-B	71	49	22	69.01
8.	ECE-C	64	43	21	67.19
9.	CSE-A	63	45	18	71.43
10.	CSE-B	59	50	9	84.75
11.	CSE-C	58	48	10	82.76
12.	CSE-D	63	52	11	82.54
Overall		**761**	**566**	**195**	**74.37%**

Annexure-II

Minutes of the meeting, BOS Mathematics (Held on 13.04.2019)

Item No-1: Introducing the members of BOS by Chairman.

The chairman of BOS extended a formal welcome and introduced the members.

Item No.2: Syllabi for the courses offered in MBA III and IV Semesters.

The detailed syllabi for the courses Employability Skills-III (Aptitude) & Employability Skills-IV (Aptitude) along with prescribed text books have been presented. With minor changes, the syllabi for the courses mentioned above have been approved. The approved syllabi for the courses are given in Appendix-BSH(M)-01.

Item No.3: Review of the Syllabi for the A.Y. 2018-19, I & II Semester of B.Tech & M.Tech Programme

No changes were suggested.

Appendix-BSH (M)-01:

Proposed Syllabus

Year/Sem	**MBA III Sem**	**L**	**T**	**P**	**C**	**COURSE CODE**
Regulation Year	2019-2020	2	-	-	MNC*	**V18MAT07**
Name of the Course	Employability Skills – III (Aptitude-1)					

(*MNC : Mandatory Non Credit Course)

COURSE OUTCOMES:

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

1. Investigate different types of logics. (K4)
2. Classify Ages and solve problems on Averages. (K2)
3. Identify accurate direction, find out angles between hands of the clock and find a day in a particular Calendar. (K3)
4. Improve problem solving skills through the concepts of Percentages, Profit &loss, and Partnership. (K3)
5. Summarize appropriate methods of logical thinking on "Ratio and Proportion"(K4)

Unit-1 SET THEORY & ANALYTICAL REASONING. Definition and concept of Venn Diagram – its applications. statements – Affirmations,

Unit-2 AVERAGES &PROBLEMS ON AGES Problems on ages with different logics. Averages and its various Interpretations, Definition and Properties, Applications of average in different cases such as Allegations – Methods of solving equations.

Unit-3 CLOCK, CALENDER & DIRECTIONS Deriving the formula to find the angle between hands for the given time, finding the time if the angle is known. History of calendar-Define year, leap year, Finding the day for the given date, Formula and method to find the day for the given date in easy way. Usage of directions north, south, east, west, Problems related to directions north, south, east, west.

Unit-4 PERCENTAGES, PROFIT AND LOSS, PARTNERSHIP Problems on percentages-Converting fractions into percentages and vice versa, Understanding of cost price, selling price, marked price, discount, percentage of profit, percentage of loss, percentage of discount, Introduction of partnership, Sleeping partner concept and problems

Unit-5 RATIO & PROPORTION Introducing the concept of ratio in three different methods, a method to compute and compare two ratios – The effect of increase or decrease of a quantity on the ratio – The meaning of proportion and Problems related to Ratio and Proportion.

TEXT BOOK:

Work book -1 on Aptitude Prepared by Training & Placement cell, Sri Vasavi Engineering College.

References: Quantitative Aptitude by

R.S. Agarwal – Sultan Chand Publications

Proposed Syllabus

Year/Sem	**MBA IV Sem**	**L**	**T**	**P**	**C**	**COURSE CODE**
Regulation Year	2019-2020	2	-	-	MNC*	**V18MAT08**
Name of the Course	Employability Skills – IV (Aptitude-2)					

(*MNC : Mandatory Non Credit Course)

COURSE OUTCOMES:

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

1. Determine various methods of Simple and compound Interest. (K5)
2. Improve problem solving skills through the concepts of "Time & Work"(K3)
3. Find the relationship among Time, Speed and Distance. (K3)
4. RelateNumbers and Letters and solvedifferent problems on Number system. (K1)
5. Analyze and solve the problems on Data Analysis. (K4)

Unit-1 SIMPLE AND COMPOUND INTEREST Definition of Simple and Compound Interest. Formulas of Applications – Difference between Simple and Compound interest – Rate of Increase or Decrease Population

Unit-2 TIME AND WORK Men Days Relation for completion of work – Capability Ratio among Men, Women and Children – Application of time in Pipes and Cistern. Work Progress in positive and negative effects.

Unit-3 TIME & DISTENCE Relation among Time Speed and Distance – Concepts of Relative speed and Average Speed – Ideas about Boats and Streams.

Unit-4 NUMBER SYSTEM AND RANKING Problems of how to find the next number in the series, Finding the missing number and related sums, , Sums related to Classification, Sums related to letter series, Relation between number series and letter series and find the Ranking.

Unit-5 DATA ANALYSIS & INTERPRETATION. Mastering the art of analyzing the data of different forms – Understanding qualitative and quantitative research.

TEXT BOOK:

Work book -II on Aptitude Prepared by T & P cell, Sri Vasavi Engineering College.

References: Quantitative Aptitude by

R.S. Agarwal – Sultan Chand Publications

Annexure-III

Minutes of the meeting, BOS of Electronics & Communication Engineering

(Held on 13.04.2019)

The ECE Department Board of Studies (BOS) meeting was conducted on 13.4.2019 at 10.30 A.M. at ECE Seminar hall. The following external members attended the meeting along with internal faculty members.. The ECE HOD, Dr E. Kusuma Kumari, BOS Chairman headed the meeting.

Details of members attended:

S.No	Name of the BOS Member	Nominee	Address
1.	Dr.E.Kusuma Kumari	Chair person	Professor & Head, ECE, SVEC
2.	Prof.I.Santhi Prabha	University Nominee	Prof.in ECE Dept., University College of Engg.,JNTUK, Kakinada
3.	Prof. M. Venugopala Rao	Subject Expert	Prof., ECE Dept., K.L.University, Vijayawada.
4.	Sri. Sunkavalli Siva Kumar	Alumni Nominee	Sr.Engineer,Qualcomm,Bangalore.
5.	Dr. P. Kishore Kumar	Invited Member	Asst.Professor, HOD, ECE,NIT, A.P
6.	All Faculty Members in Dept.	Members	ECE Dept., SVEC

The following are the key points discussed in the meeting.

Key Discussions:

- **Item No.1: Review of the B. Tech ECE Course Structure**

- The Chairman and BOS members reviewed the course structure of B. Tech ECE and suggested modifications in the structure.
- Members suggested to combine Analog Communication(V18ECT07) in IV sem and Digital communication(V18ECT11) in V Sem courses as a single course as Analog & Digital Communication Course (V18ECT07)
- Members suggested to include Advanced communication course (V18ECT16) in the VI Semester.
- Members suggested to combine the lab courses Analog Comm. Lab (V18ECL05) & Digital Communications Lab (V18ECL07) as a Communications Lab (V18ECL05) and to be included in IV Semester.
- In 5th Semester theory course Digital Communication (V18ECT11) & Digital Comm. Lab Course (V18ECL07) are replaced with Digital Signal Processing

(V18ECT11) & Lab Courses (V18ECL07)

- Members suggested to include lab Course Mini Project using IOT(V18ECL12) and Theory Course Artificial Intelligence (V18ECT24) as program Elective Course in the course structure
- English BOS has renamed the titles of mandatory Courses Employability Skills I (V18ENT03) & Employability Skills II (V18ENT04) to Professional Communication Skills I (V18ENT03) & Professional Communication Skills II (V18ENT04) respectively in the III & IV Semesters of Course structure.
- It was decided that the mandatory Course Constitution of India (V18ENT11) to be included instead of Indian Traditional Knowledge (V18ENT07) in the III Semester of Course structure.
- The approved course structure for the Academic Year 2019-20 was given in **Appendix-ECE-01**

➢ **Item No.2: Suggest syllabi for proposed III and IV Semester course structure for the Academic year 2019- 2020**

- The approved syllabi for courses offered in III &IV Semesters are given in **Appendix-ECE-02**
- For EEE & CSE Programmes, the following courses and Syllabus are approved and it was given in **Appendix-ECE-03**

S.No.	Programme	SEM	Course Code	Course Name
1	EEE	III	V18ECT05	Analog Electronics
2	EEE	III	V18ECL03	Analog Electronics Lab
3	CSE	III	V18ECT06	Digital Electronics
4	CSE	III	V18ECL04	Digital Electronics Lab

➢ **Item No 3: Approval for Course Structure For New Programme Electronics & Communication Technology**

- The Institution has filed an application with approved authorities for grant of New Programme Electronics & Communication Technology (ECT) for the academic year 2019-20.
- In this connection it is decided to follow the prescribed course structure of ECE I Semester & II Semester for the academic year 2019-20 for the new Programme ECT. Details are given in **Appendix-ECE-04.** Finally, the chairman thanked to all the BOS members and faculty. The meeting ended at 4.30 P.M

Appendix-ECE-01

III Semester

S. No	Course Code	Course Name	L	T	P	Credits
1	V18ECT01	Electronic Devices & Circuits	3	1	-	4
2	V18ECT02	Digital System Design	3	-	-	3
3	V18ECT03	Signals & Systems	3	1	-	4
4	V18ECT 04	Network Theory	3	-	-	3
5	V18MBT51	Managerial Economics & Financial Analysis	3	-	-	3
6	V18ECL01	Electronic Devices & Circuits LAB	-	-	2	1
7	V18ECL02	Digital System Design LAB	-	-	2	1
8	V18ENT03	Professional Comm. Skills- I	3	-	-	MNC
9	V18ENT11	Constitution of India	2	-	-	MNC
		TOTAL	**20**	**2**	**4**	**19**

Total Contact Hours: 26 **Total Credits : 19**

IV Semester

S. No	Course Code	Course Name	L	T	P	Credits
1	V18ECT07	Analog & Digital Communications	3	1	-	4
2	V18ECT08	Analog Circuits	3	1	-	4
3	V18ECT09	Probability Theory & Stochastic Process	3	1	-	4
4	V18ECT10	Electromagnetic Waves & Transmission Lines	3	1	-	4
5	V18MAT03	Mathematics-III	3	-	-	3
6	V18ECL 05	Communications Lab	-	-	2	1
7	V18CSL32	Object Oriented Programming Through Java Lab	-	-	2	1
8	V18ECL06	Analog Circuits Lab	-	-	2	1
9	V18ENT04	Professional Comm Skills- II	3	-	-	MNC
		TOTAL	**18**	**4**	**6**	**22**

Total Contact Hours: 28 **Total Credits: 22**

Appendix-ECE-02

III - SEMESTER

Course : Electronic Devices And Circuits

Code : V18ECT01

L	T	P	C
3	1	-	4

COURSE OUTCOMES:

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

1. Explain the basic concepts of semiconductor physics and explain the formation of p-n Junction. **[K2]**
2. Discuss special semiconductor diodes. **[K2]**
3. Construct and working principle of rectifiers with and without filters with relevant expressions and necessary comparisons **[K3]**
4. Describe the construction, principle of operation of transistors, BJT and FET with their V-I characteristics in different configurations. **[K2]**
5. Explain the need of transistor biasing, various biasing techniques for BJT and FET and stabilization concepts with necessary expressions. **[K2]**
6. Analyze small signal low frequency transistor amplifier circuits using BJT and FET in different configurations. **[K4]**

Syllabus:

UNIT-I:Semi Conductor Physics & Junction diode characteristics: Review of semiconductor physics, continuity equation, law of junction, p-n junction diode, current components in PN junction Diode, derivation of diode equation, V-I Characteristics, Diode resistance, Diode capacitance, energy band diagram of PN junction Diode.

UNIT- II: Special Semiconductor Diodes: Zener Diode, Breakdown mechanisms, Zener diode applications, LED, LCD, LDR, Photo diode, Photo transistor, Varactor diode, Tunnel Diode, DIAC, TRIAC, SCR, UJT, Construction, operation and characteristics of all the diodes are required to be considered.

UNIT- III: Rectifiers and Filters: Basic Rectifier setup**,** half wave rectifier, full wave rectifier, bridge rectifier, derivations of characteristics of rectifiers, rectifier circuits-operation, input and output waveforms, Filters, Inductor filter, Capacitor filter, L-section filter, π-section filter multiple L section and π-section filter, derivation for ripple factor in each case.

UNIT- IV: Transistor Characteristics: BJT: Junction transistor, transistor current components, transistor equation, transistor configurations, transistor as an amplifier, characteristics of transistor in Common Base, Common Emitter and Common Collector configurations, punch through/ reach through, typical transistor junction voltage values.

FET: FET types, construction, operation, characteristics, parameters, MOSFET-types, construction, operation, characteristics, comparison between JFET and MOSFET.

UNIT- V: Transistor Biasing and Thermal Stabilization: Need for biasing, operating point, load line analysis, BJT biasing- methods, basic stability, fixed bias, collector to base bias, self bias, Stabilization against variations in VBE, Ic, and β, Stability factors, (S, S', S''), Bias compensation, Thermal runaway, Thermal stability. FET Biasing.

UNIT- VI: Small Signal Low Frequency Transistor Amplifier Models:

BJT: Two port network, Transistor hybrid model, determination of h-parameters, conversion of h-parameters, Generalized analysis of transistor amplifier model using h-parameters, Analysis of CB, CE and CC amplifiers using exact and approximate analysis, Comparison of transistor amplifiers. Generalized analysis of FET amplifier small signal model, analysis of CS amplifier.

Text Books:

1. Electronic Devices and Circuits- J. Millman, C. Halkias, Tata Mc-Graw Hill, Second Edition.
2. Integrated Electronics- Jacob Millman, C. Halkies, C.D.Parikh, Tata Mc-Graw Hill, 2009.
3. Electronic Devices and Circuits – R.L Boylestad and Louis Nashelsky, Pearson publications

References:

1. Electronic Devices and Circuits-K. Satya Prasad, VGS Book Links.
2. Electronic Devices and Circuits-Salivahanan, Kumar, Vallavaraj, Tata Mc-Graw Hill, Second Edition
3. Electronic Devices and Circuits – Bell, Oxford
4. Electronic Devices and Circuits-A.P Godse,U.A.Bakshi , Technical publications

Course: Digital System Design
Code:V18ECT02

L	T	P	C
3	-	-	3

COURSE OUTCOMES:

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

1. Explain the various types of number systems and their conversions, codes and logic Gates.(K_2)
2. Apply the minimization techniques to simplify the hardware requirements of digital circuits. (K_3)
3. Develop basic digital circuits with combinational logic using IEEE Standard 1076 Hardware Description Language (VHDL). (K_3)
4. Develop basic digital circuits with sequential logic using IEEE Standard 1076 Hardware Description Language (VHDL). (K_3)
5. Apply the knowledge of flip flops to construct different finite state machines (K_3)
6. Explain the concepts of different programmable logic devices. (K_2)

UNIT – I: **NUMBER SYSTEMS & CODES**

i) Representation of numbers of different radix, conversion from one radix to another radix, r-1's and r's complements of signed members, problem solving.
ii) 4 bit codes, BCD, Excess-3, 2421, 84-2-1 code etc.,
iii) Basic logic operations -NOT, OR, AND, Universal building blocks, EX-OR, EX-NOR - Gates, Standard SOP and POS forms, Gray code, error detection and correction codes, NAND-NAND and NOR-NOR realizations.

UNIT – II: MINIMIZATION TECHNIQUES

Boolean theorems, principle of complementation & duality, De-Morgan theorems, minimization of logic functions using Boolean theorems, minimization of switching functions using K-Map up to 4 variables, tabular minimization, problem solving (code-converters using K-Map etc..).

COMBINATIONAL LOGIC CIRCUITS DESIGN - I

Design of half adder, full adder, half subtractor, full subtractor, 4-bit adder-subtractor circuit, BCD adder circuit, Look-a-head adder circuit.

UNIT – III: COMBINATIONAL LOGIC CIRCUITS DESIGN -II

Design of decoder, encoder, priority encoder, multiplexer and demultiplexer, 4-bit digital comparator, Higher order multiplexing and demultiplexing, Realization of Boolean functions using decoders and multiplexers, Modeling of combinational logic circuits using VHDL.

UNIT – IV: SEQUENTIAL CIRCUITS-I

Classification of sequential circuits, basic flip-flops, truth tables and excitation tables, Conversion from one flip-flop to another flip-flop.
Design of registers: shift register, bi-directional shift register and universal shift register. Design of ripple counters, design of synchronous counters, Johnson counter, ring counter. Modeling of sequential circuits using VHDL

UNIT – V: SEQUENTIAL CIRCUITS-II

Finite state machine, Analysis of clocked sequential circuits, state diagrams, state tables, reduction of state tables and state assignment, design procedures. Realization of circuits using various flip-flops. Mealy to Moore conversion and vice-versa.

UNIT-VI: INTRODUCTION TO PLDs

PROM, PAL, PLA-Basics structures, merits & demerits, comparison, realization of Boolean functions and programming tables using PROM, PAL, PLA.

TEXT BOOKS:

1. Switching and finite automata theory-Zvi Kohavi,TMH, 2nd edition, 2008
2. Switching Theory and Logic Design - A. Anand Kumar, PHI Learning Pvt. Ltd, 3rd edition, 2016.
3. Digital Design Principles & Practices – John F. Wakerly, PHI/ Pearson Education Asia, 3rd edition, 2005.
4. Digital Design - M.Morris Mano, Michael D Ciletti, Pearson Education Asia, 4th edition.
5. VHDL Primer – J. Bhasker, Pearson Education/ PHI, 3rd Edition.

REFERENCES:

1. Modern Digital Electronics - RP Jain, TMH Education Pvt., Ltd.,, 4th edition, 2010.
2. Fundamentals of Logic Design - Charles H. Roth Jr, Jaico Publishers.
3. Fundamentals of Digital Logic with VHDL Design- Stephen Brown, ZvonkoVranesic, McGraw-Hill, 3rd Edition.

Course : Signals & Systems
Code : V18ECT03

L	T	P	C
3	1	-	4

Prerequisite: Fundamentals of Electrical Circuits, Linear Algebra and Differential Equations, Ordinary Differential Equations.

COURSE OUTCOMES:

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

CO1: Apply the knowledge of linear algebra to vector space& analogy, orthogonality and basic signals.K3

CO2: Classify systems based on their properties and determine the response of LTI system using convolution K2

CO3: Analyze the spectral characteristics of continuous-time signals and systems using Fourier analysis K4

CO4: Apply sampling theorem concept to convert continuous time signals to discrete time signal and reconstruct.K3

CO5: Apply Laplace transform and inverse Laplace transform to analyze continuous time signals and systems with respect to ROC.K3

CO6: Apply Z transform to analyze discrete time signals and systems with respect to ROC.K3

UNIT-I

BASIC SIGNALS: Introduction to signal and system, Classification of Signals, Elementary signals, Signal properties and operations, Orthogonal signal space, Signal approximation using orthogonal functions.

UNIT-II

LINEAR-TIME INVARIANT SYSTEMS: Properties of Systems, Continuous-Time LTI Systems: The Convolution Integral; Properties of Linear Time-Invariant Systems; Causal LTI Systems Described by Differential and Difference Equations.

UNIT III

FOURIER SERIES REPRESENTATION OF PERIODIC SIGNALS: Trigonometric and Exponential fourier series, Fourier Series Representation of Continuous-Time Periodic Signals(Sinusoidal, triangular and square); Convergence of the Fourier Series.

Fourier Transforms: Representation of Aperiodic Signals; The Continuous-Time Fourier Transform; The Fourier Transform for Periodic Signals; Properties of Continuous-Time Fourier Transform.

UNIT-IV

Representation of a Continuous-Time Signal by its Samples; The Sampling Theorem; Reconstruction of a Signal From its Samples; The Effect of Under Sampling; Aliasing; Discrete-Time Processing of ContinuousTime Signals; Sampling of Discrete-Time Signals.

UNIT-V

Laplace Transforms: The Laplace transform; The Region of Convergence for Laplace Transforms; The Inverse Laplace Transform; Properties of the Laplace Transform; Laplace Transform Pairs; Analysis and Characterization of LTI Systems Using the Laplace Transform.

UNIT-VI

Z-Transforms: The Region of Convergence for the Z-Transform; Properties of the Z-Transform; Z-Transform Pairs; Analysis and Characterization of LTI Systems using Z-Transforms.

TEXT BOOKS:

1. Signals and Systems, A.V. Oppenheim and A.S. Willsky with S. H. Nawab, Second Edition, PHI Private limited.
2. Signals and Systems, Second Edition, S. Haykin and B. Van Veen, John Wiley & Sons.
3. B. P. Lathi, "Principles of Linear Systems and Signals", Second Edition, Oxford, 2009.

REFERENCES:

1. R.E.Zeimer, W.H.Tranter and R.D.Fannin, "Signals & Systems - Continuous and Discrete", Pearson, 2007.
2. John Alan Stuller, "An Introduction to Signals and Systems", Thomson, 2007. 40
3. M.J.Roberts, "Signals & Systems Analysis using Transform Methods & MATLAB", Tata McGraw Hill, 2007.
4. ocw.mit.edu › Supplemental Resources › Signals and Systems
5. www.satishkashyap.com/2012/04/iit-video-lectures-on-signals-and.html
6. nptel.ac.in/courses/117104074/1
7. www.cdeep.iitb.ac.in/nptel/.../Signals%20and%20System/TOC-M1.htm
8. freevideolectures.com/Subject/Signals-Systems

Course : Network Theory
Code : V18ECT04

L	T	P	C
3	-	-	3

COURSE OUTCOMES:

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

1. Solve the electrical network using mesh and nodal analysis (K3)
2. Apply network theorems to analyze the Electric circuits.(K3)
3. Explain RLC transient circuits and Filters (K2)
4. Describe the steady state analysis of RLC circuits (K2)
5. Analyze the resonance circuits (K4)
6. Solve the two port network parameters (K3)

UNIT – I

Introduction to Electrical Circuits : Network elements classification, Electric charge and current, Electric energy and potential, Resistance parameter – series and parallel combination, Inductance parameter – series and parallel combination, Capacitance parameter – series and parallel combination. Energy sources: Ideal, Non-ideal, Independent and dependent sources, Source transformation, Kirchoff's laws, Mesh analysis and Nodal analysis problem solving with resistances only including dependent sources.

Unit-II

Network theorems: Thevinin's, Norton's, Milliman's, Reciprocity, Compensation, Substitution, Superposition, Max Power Transfer, - problem solving using dependent sources also.

UNIT – III

Transients: Definition of time constants, R-L circuit, R-C circuit with DC excitation, Evaluating initial conditions procedure, problem solving using R-L-C elements with DC excitation. Solutions using Laplace transform method.

UNIT – IV

Steady State Analysis of A.C Circuits: Response to sinusoidal excitation - pure resistance, pure inductance, pure capacitance, impedance concept, phase angle, series R-L, R-C, R-L-C circuits problem solving. Complex impedance and phasor notation for R-L, R-C, R-L-C problem solving using mesh and nodal analysis, problem solving.

UNIT – V

Resonance: Introduction, Definition of Q, Series resonance, Bandwidth of series resonance, Parallel resonance, Condition for maximum impedance, current in anti resonance, Bandwidth of parallel resonance, anti resonance at all frequencies.

UNIT – VI

Two-port networks: Relationship of two port networks, Z-parameters, Y-parameters, Transmission parameters, h-parameters, Relationship between parameter sets, Parallel connection of two port networks, Cascade connection of two port networks, series connection of two port networks, problem solving.

TEXT BOOKS:

1. Electric Circuit Analysis by Hayt and Kimmarle, TMH Eigth Edition ,2012.
2. Network Analysis by Van-Valkenberg.

REFERENCES:

1. Circuit Theory (Analysis and Synthesis) By ABHIJIT Chakrabarti 7th Revised Edition,Dhanpat Rai &Co.
2. Basic Circuit Analysis by DR Cunninghan, Jaico Publishers.
3. Network Analysis and Filter Design by Chadha, Umesh Publications.
4. Circuits & Network Analysis & Synthesis - A.Sudhakar & Shyam Mohan S.Pillai Tata McGraw Hill, 2nd Edition, 1994.

Course : Managerial Economics and Financial Analysis
Code : V18MBT51

L	T	P	C
3	-	-	3

COURSE OUTCOMES:

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

CO1: Understand the basic concepts of managerial economics, demand, and elasticity of demand and methods of demand forecasting. **[K2]**
CO2: Estimate the production function with one, two and infinite variables. Understand various cost concepts and calculating breakeven point **[K2]**
CO3: Understand and showing a price output determination in different types of market structures and knowing various pricing methods **[K2]**
CO4: Understand various forms of business organizations **[K2]**
CO5: Prepare financial statements and its analysis. **[K3]**
CO6: Appraise the projects by using various capital budgeting methods **[K4]**

UNIT-I Introduction to Managerial Economics and demand Analysis: Definition of Managerial Economics –Scope of Managerial Economics and its relationship with other subjects – Concept of Demand, Types of Demand, Determinants of Demand- Demand schedule, Demand curve, Law of Demand and its limitations- Elasticity of Demand, Types of Elasticity of Demand and Measurement- Demand forecasting and Methods of forecasting..

UNIT – II Production and Cost Analyses: Concept of Production function- Cobb-Douglas Production function- Law of Variable proportions-Isoquants and Isocosts and choice of least cost factor combination-Concepts of Returns to scale and Economies of scale-Different cost concepts: opportunity costs, explicit and implicit costs- Fixed costs, Variable Costs and Total cost –Cost–Volume-Profit analysis-Determination of Breakeven point(simple problems)Managerial significance and limitations of Breakeven point.

UNIT – III Introduction to Markets, & Pricing Policies: Market Structures: Perfect Competition, Monopoly, Monopolistic competition and Oligopoly – Features – Price and Output Determination – Methods of Pricing: Average cost pricing, Limit Pricing, Market Skimming Pricing, Internet Pricing, Flat Rate Pricing, Usage sensitive pricing and Priority Pricing.

UNIT – IV Types of Business Organization and Business Cycles: Features and Evaluation of Sole Trader, Partnership, Joint Stock Company – State/Public Enterprises and their forms – Business Cycles : Meaning and Features – Phases of Business Cycle.

UNIT – V Introduction to Accounting & Financing Analysis: Introduction to Double Entry Systems – Preparation of Financial Statements-Analysis and Interpretation of Financial Statements-Ratio Analysis

UNIT – VI Capital and Capital Budgeting: Capital Budgeting: Meaning of Capital-Capitalization-Meaning of Capital Budgeting-Time value of money- Methods of appraising Project profitability: Traditional Methods and modern methods (simple problems)

TEXT BOOKS

1. Dr. N. AppaRao, Dr. P. Vijay Kumar: 'Managerial Economics and Financial Analysis',Cengage Publications, New Delhi – 2011
2. Dr. A. R. Aryasri – Managerial Economics and Financial Analysis, TMH 2011
3. Prof. J.V.Prabhakararao, Prof. P. Venkatarao. 'Managerial Economics and Financial Analysis', Ravindra Publication.

REFERENCES:

1. Shailaja Gajjala and Usha Munipalle, Univerties press, 201 Dr. B. Kuberudu and Dr. T. V. Ramana: Managerial Economics & Financial Analysis, Himalaya Publishing House, 2014.
2. V. Maheswari: Managerial Economics, Sultan Chand.2014
3. Suma Damodaran: Managerial Economics, Oxford 2011.
4. VanithaAgarwal: Managerial Economics, Pearson Publications 2011.
5. Sanjay Dhameja: Financial Accounting for Managers, Pearson
6. Maheswari: Financial Accounting, Vikas Publications.
7. S. A. Siddiqui&A. S. Siddiqui: Managerial Economics and Financial Analysis, New Age International Publishers, 2012
8. Ramesh Singh, Indian Economy, 7th Edn., TMH2015
9. Pankaj Tandon A Text Book of Microeconomic Theory, Sage Publishers, 2015

Course: Electronic Devices and Circuits Lab
Code : V18ECL01

L	T	P	C
-	-	2	1

COURSE OUTCOMES:

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

CO-1 : Identify, Test and describe the specifications of various components. **[K2]**
CO-2: Find the unknown Frequency using Cathode Ray Oscilloscope. **[K1]**
CO-3: Interpret the Characteristics of various semiconductor devices. **[K2]**
CO-4: Sketch the Regulation Characteristics of Zener Diode. **[K3]**
CO-5: Examine the Performance of Rectifiers with and without Filters. **[K3]**
CO-6 : Sketch the Frequency Response of Amplifiers and Compute Bandwidth. **[K3]**

Electronic Workshop Practice:

1. Identification, Specifications, and Testing of R, L, C Components (Colour Codes), Potentiometers, Coils, Gang Condensers, Relays, Bread Boards.
2. Identification, Specifications and Testing of active devices like Diodes, BJTs, JFETs, LEDs, UJT.
3. Study and operation of Ammeters, Voltmeters, Transformers, Analog and Digital Multimeter, Function Generator, Regulated Power Supply and CRO..

List of Experiments:

1. P-N Junction Diode Characteristics
   Part A: Germanium Diode (Forward bias only)
   Part B: Silicon Diode (Forward & Reverse bias)
2. Rectifiers (without and with c-filter)
   Part A: Half-wave Rectifier
   Part B: Full-wave Rectifier
3. Zener Diode Characteristics
   Part A: V-I Characteristics
   Part B: Zener Diode as Voltage Regulator
4. BJT Characteristics (CB Configuration)
   Part A: Input Characteristics
   Part B: Output Characteristics
5. BJT Characteristics (CE Configuration)
   Part A: Input Characteristics
   Part B: Output Characteristics
6. FET Characteristics (CS Configuration)
   Part A: Drain Characteristics
   Part B: Transfer Characteristics
7. UJT Characteristics
8. BJT-CE Amplifier
9. Emitter Follower-CC Amplifier
10. FET-CS Amplifier

Course : Digital System Design Lab
Code : V18ECL02

L	T	P	C
-	-	2	1

COURSE OUTCOMES:

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

1. Examine the logic behavior of various IC gates.(K_3)
2. Construct and test combination logic circuits. (K_3)
3. Construct and test synchronous Asynchronous sequential circuits. (K_3)
4. Develop and Simulate Combinational logic circuit and validate its functionality using VHDL on Xilinx Software Package. (K_3)
5. Develop and Simulate Sequential logic circuit and validate its functionality using VHDL on Xilinx Software Package. (K_3)

LIST OF EXPERIMENTS

Part A: USING HARDWARE (Minimum of 5 Experiments to be done)

1. Verification of Basic Logic Gates and implementing all individual gates with Universal Gates.
2. Construct Half Adder and Full Adder using Half Adder and verify the truth table.
3. Design a Combinational Logic circuit for 3X8 Decoder and verify the truth table.
4. Design a Combinational Logic circuit for 4x1 MUX, 1X4 De-MUX and verify the truth table.
5. Verification of truth tables of the basic Flip- Flops with Synchronous and Asynchronous modes.
6. Design a Decade Counter and verify the truth table.

Part B: USING XILINX Tool (Minimum of 5 Experiments to be done)

Note: The students are required to design and draw the internal logical structure of the following Digital Circuits and to develop VHDL/Verilog HDL Source code, perform simulation using relevant simulator and analyze the obtained simulation results using necessary synthesizer.

1. Design of Full Adder using 3 modeling systems.
2. 8 to 3 Encoder (with and without parity).
3. 4- Bit comparator-IC 7485.
4. Flip-Flops (D/SR/JK Flip-Flops).
5. 4 bit binary up/down counter-IC74193.
6. Shift registers-IC 7495.

IV SEMESTER
Course : Analog & Digital Communications
Code : V18ECT07

L	T	P	C
3	1	-	4

Pre requisites: Signals and systems, Mathematics.

COURSE OUTCOMES:

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

1. Explain the spectral characteristics, generation and detection techniques of Amplitude modulation techniques (K2)
2. Explain the spectral characteristics, generation and detection techniques of angle modulation techniques (K2)
3. Illustrate different types of noise and predict its effect on analog communication Systems.(K3)
4. Describe the generation and detection methods of various digital modulation schemes.(K2)
5. Analyze Optimal Reception of Digital Signal and explain various multiple access techniques.(K4)
6. Describe the concepts of error control coding (K2).

UNITI

Analog Modulation: Need for modulation, Frequency Division Multiplexing, **Linear Modulation Techniques** - AM, DSB-SC, SSB, VSB - Time domain and frequency domain description, single tone modulation, power relations - Generation & Detection.Applications, AMTransmitters, AM Receivers - Super-heterodyne receiver, IF, AGC.

UNIT II

Angle Modulation: Phase and Frequency Modulation, Narrow band and Wide band FM, Carsons rule, Indirect and direct method of FM generation, Detection of FM, Applications, Phase locked loop, Comparison of FM and AM. FMTransmitters, FM Receivers.

UNIT III

Noise in Analog Communication system: Noise in DSB &SSB system, Noise in AM system, Noise in Angle Modulation system,Pre-emphasis and de-emphasis.

Pulse Modulation: Time Division Multiplexing,PAM, PWM, PPM-Generation and Detection.

UNIT IV

Digital Modulation Systems: Pulse Modulation: Baseband signals. Sampling process; Quantization Process; Quantization Noise; Pulse-Code Modulation; Noise Considerations in PCM Systems; Differential Pulse-Code Modulation, Delta modulation, adaptive delta modulation, Amplitude, phase and frequency shift keying schemes (ASK, PSK, FSK), M-array modulation schemes.

UNIT V

Optimal Reception of Digital Signal: Matched filter receivers, optimum receiver - bandwidth consideration and probability of error calculations for these schemes.

Multiple Access Techniques: TDMA, FDMA and CDMA

UNIT VI

Information theory and Error control Coding: Measure of information – Entropy, Information rate– Source coding theorem – Channel capacity – Shannon-Hartley law – Shannon's limit-Error, control Codes – Linear codes, Cyclic codes, Convolution Coding.

TEXT BOOKS:

1. Simon Haykin and Michael Moher, "An Introduction to Analog & Digital Communications", 2nd Ed., Wiley, (2007).
2. H Taub& D. Schilling, GautamSahe, "Principles of Communication Systems", TMH, 3rd Edition, (2007).
3. Tomasi, Wayne, "Electronics Communication Systems- Fundamentals through advanced", 5th Edition, Pearson Education, 2009
4. Lathi, "Modern Digital & Analog Communications Systems", 2e, Oxford University Press

REFERENCE BOOKS:

1. Loen W. Couch, "Modern Communication Systems: Principles & Applications", Prentice Hall, (P621.382/84), (1995)
2. Bruce Carlson, Paul B. Crilly and Janet C. Rutledge, "Communication Systems: An Introduction to Signals and Noise in Electrical Communications", 4th Edition, McGraw-Hill, (2002).
3. Simon Haykin, "Communication Systems", 4th Edition, John Wiley & Sons, (2001).
4. NevioBenvenuto, Roberto Corvaja, Tomaso Erseghe, and Nicola Laurenti, "Communication Systems: Fundamentals and Design Methods", John Wiley & Sons, (2006).
5. Andrew J. Viterbi & Jim K. O, "Principles of Digital Communication and Coding", McGraw-Hill Book Company.
6. Bernard Sklar, "Digital Communications - Fundamentals and Applications", 2E, Prentice Hall.
7. Sam Shanmugam, K, "Digital and Analog Communication Systems", Wiley publisher (2006).

Course: Analog Circuits
Code: V18ECT08

L	T	P	C
3	1	-	4

COURSE OUTCOMES:

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

1. Construct wave shaping circuits for various applications
2. Analyze transistor amplifier circuits at low and high frequencies.
3. Explain the operation of Feedback and Power amplifiers
4. Explain the operation of sinusoidal and non sinusoidal oscillators
5. Construct circuits for different applications using ICs.
6. Explain the operation of Active filters and Data Converters

Unit I

Wave shaping circuits: Response of high pass and low pass RC circuits to step, pulse inputs. High pass RC circuit as differentiator, low pass RC circuit as integrator. Series and shunt clippers, clipping at two independent levels, Positive and Negative Clampers.

Unit II

Transistor at High frequencies: Hybrid π CE transistor model, CE short circuit current gain, Current gain with resistive load, Gain bandwidth product.

Multistage amplifiers: Low frequency analysis of cascade and cascode amplifiers.

Unit III

Feedback and Power amplifiers: Voltage series, current series, voltage shunt, current shunt feedback amplifiers, effect of negative feedback. Various classes of operation (Class A, B, AB, C), power efficiency calculations.

Unit IV

Oscillators: Oscillators: Basic concept, Barkhausen criterion, RC oscillators (phase shift, Wien bridge), LC oscillators (Hartley, Colpitts) Non-sinusoidal oscillators: Bistable, Monostable and Astable Multivibrators.

Unit V

Integrated Circuits and applications: Op-amp Block Diagram, Ideal Op-amp, Equivalent Circuit, Power supplies, Ideal voltage transfer curve, open loop op-amp configurations. Inverting and non-inverting amplifiers, summing, scaling, averaging amplifier, integrator and differentiator, 555 timer functional block diagram, Astable and Monostable multivibrators.

Unit VI

Active filters and Data Converters: First order Low pass, high pass, band pass and band stop filters, All pass filter design guidelines. Weighted resistor DAC, R-2R ladder DAC. Dual slope ADC, Successive approximation ADC, flash ADC.

Text Books:

1. Integrated Electronics- J. Millman and C.C. Halkias, TMH
2. Electronic Devices and Circuits- Salivahanan, N.Suresh Kumar, A. Vallavaraj, TMH
3. Pulse, Digital and Switching Waveforms - J. Millman and H. Taub, TMH
4. Pulse and Digital Circuits – A. Anand Kumar, PHI
5. Linear Integrated Circuits – D. Roy Choudhury, 4th edition, New Age International (p) Ltd.

6. Op-Amps & Linear Integrated Circuits - Ramakanth A. Gayakwad,3rd edition, PHI.

References :

1. Electronic Devices and Circuits Theory – Robert L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall.
2. Electronic Circuit Analysis - B.V.Rao, K.R.Rajeswari, P.C.R.Pantulu, K.B.R.Murthy, Pearson Publications.
3. Pulse & Digital Circuits-BN Yoga Narasimhan, 2000,Sri Maruthi Publishers, Bangalore.
4. Operational Amplifiers & Linear Integrated Circuits –Sanjay Sharma ;SK Kataria &Sons;2nd Edition,2010

Course: Probability Theory & Stochastic Processes

L	T	P	C
3	1	-	4

Code : V18ECT09

COURSE OUTCOMES:

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

1. Explain basic concepts of probability theory through Sets and Relative Frequency **[K2]**
2. Explain the concept of a random variable, functions based on random variable like distribution and density functions **[K2]**
3. Compute the expected value, moments on one random variable **[K3]**
4. Illustrate the concepts of joint distribution & density functions on multiple random variables and their transformations with examples **[K3]**
5. Compute the statistical characteristics of stochastic processes like auto correlation & cross correlation functions. **[K3]**
6. Calculate the power density spectrum and cross power- density spectrum of signals **[K3]**

UNIT I: PROBABILITY : Probability introduced through Sets and Relative Frequency: Experiments and Sample Spaces, Discrete and Continuous Sample Spaces, Events, Probability Definitions and Axioms, Mathematical Model of Experiments, Probability as a Relative Frequency, Joint Probability, Conditional Probability, Total Probability, Bayes' Theorem, Independent Events

UNIT II: **THE RANDOM VARIABLE**: Definition of a random variable, Discrete, continuous and mixed random Variables. Distribution & density functions and its properties of a random variable. Binomial, Poisson, Uniform, Gaussian, Exponential and Rayleigh random variables. Conditional distribution and density functions and its properties.

UNIT III: OPERATION ON ONE RANDOM VARIABLE – EXPECTATIONS : Introduction, expected value of a random variable, function of a random variable, moments about the origin, central moments, variance, characteristic function, moment generating function, transformations of a random variable: Monotonic transformations for a continuous random variable

UNIT IV: MULTIPLE RANDOM VARIABLES : Vector random variables, joint distribution function, properties of joint distribution, marginal distribution functions, conditional distribution and density, statistical independence, sum of two random variables, sum of several random variables, central limit theorem: unequal distribution, equal distributions.

OPERATIONS ON MULTIPLE RANDOM VARIABLES: Joint moments about the origin, joint central moments, joint characteristic functions, jointly Gaussian random variables: two random variables case, N-random variables case

UNIT V: RANDOM PROCESSES – TEMPORAL CHARACTERISTICS: The random process concept, classification of processes, deterministic and nondeterministic processes, distribution and density functions, concept of Stationarity and statistical independence. First-order stationary processes, second-order and wide-sense Stationarity, nth-order and strict-sense Stationarity, time averages

and Ergodicity, autocorrelation function and its properties, cross-correlation function and its properties, covariance functions

UNIT VI: RANDOM PROCESSES – SPECTRAL CHARACTERISTICS: The power density spectrum: properties, relationship between power density spectrum and autocorrelation function, the cross-power density spectrum, properties, relationship between cross-power density spectrum and cross-correlation function.

TEXT BOOKS:

1. Probability, Random Variables & Random Signal Principles, Peyton Z. Peebles, TMH, 4th Edition, 2001.
2. Probability, Random Variables and Stochastic Processes, Athanasios Papoulis and S.Unnikrishna Pillai, PHI, 4th Edition, 2002.
3. Probability Theory and Stochastic Processes, Y. Mallikarjuna Reddy, 4th Edition, Universities Press,

REFERENCE BOOKS:

1. Probability Theory and Stochastic Processes – B. Prabhakara Rao, BS Publications
2. Probability and Random Processes with Applications to Signal Processing, Henry Stark and John W. Woods, Pearson Education, 3rd Edition.
3. Schaum's Outline of Probability, Random Variables, and Random Processes.
4. An Introduction to Random Signals and Communication Theory, B.P. Lathi, International Textbook, 1968.
5. Random Process – Ludeman , John Wiley
6. Probability Theory and Random Processes, P. Ramesh Babu, McGrawHill, 2015.

L	T	P	C
3	1	-	4

Course: Electro Magnetic Waves & Transmission Lines
Code : V18ECT10

COURSE OUTCOMES:

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

1. Use Various laws of static electric field to determine E. (K3)
2. Use Various laws of magneto static field to determine H and Apply Maxwell's equations to analyze the time varying behavior of EM waves (K3)
3. Compute the Propagation Characteristics of the EM Waves in different mediums. (K3)
4. Calculate Brewster angle, critical angle and total internal reflection. (K3)
5. Compute Primary and Secondary constants for a given transmission line(K3)
6. Calculate reflection coefficient, VSWR etc. using smith chart(K3)

UNIT I: Review of Co-ordinate Systems, **Electrostatics:** Coulomb's Law, Electric Field Intensity Electric Flux Density, Gauss Law and Applications, Electric Potential, Maxwell's Two Equations for Electrostatic Fields, Energy Density, Illustrative Problems. Convection and Conduction Currents, Dielectric Constant, Continuity Equation, Relaxation Time, Poisson's and Laplace's Equations; Types of Capacitance Illustrative Problems.

UNIT II: Magneto Statics : Biot-Savart Law, Ampere's Circuital Law and Applications, Magnetic Flux Density, Maxwell's Two Equations for Magneto static Fields, Magnetic Scalar and Vector Potentials, Ampere's Force Law, Inductances and Magnetic Energy. Illustrative Problems.

Maxwell's Equations (Time Varying Fields): Faraday's Law and Transformer emf, Inconsistency of Ampere's Law and Displacement Current Density, Maxwell's Equations in Different Final Forms and Word Statements. Introduction to Boundary conditions. Illustrative Problems.

UNIT III: EM Wave Characteristics - I: Wave Equations for Conducting and Perfect Dielectric Media, Uniform Plane Waves – Definition, All Relations between E & H. Sinusoidal Variations. Wave Propagation in Lossless and Conducting Media. Wave Propagation in Good Conductors and Good Dielectrics. Polarization. Illustrative Problems.

UNIT IV: EM Wave Characteristics – II: Reflection and Refraction of Plane Waves – Normal and Oblique Incidences, for Perfect Dielectrics, Brewster Angle, Critical Angle and Total Internal Reflection, Surface Impedance. Poynting Theorem – Applications, Illustrative Problems.

UNIT V: Transmission Lines - I : Types, Parameters, Transmission Line Equations, Primary & Secondary Constants, Expressions for Characteristic Impedance, Propagation Constant, Phase and Group Velocities, Infinite Line Concepts, Lossless line. Condition for Distortionless Line. Illustrative Problems.

UNIT VI: Transmission Lines – II : Input Impedance Relations, SC and OC Lines, Reflection Coefficient, VSWR. UHF Lines as Circuit Elements; $\lambda/4$, $\lambda/2$, $\lambda/8$ Lines – Impedance Transformations. Smith Chart – Configuration and Applications, Single Stub Matching. Illustrative Problems.

TEXT BOOKS:

1. Elements of Electromagnetic – Matthew N.O. Sadiku, Oxford Univ. Press, 3rd ed., 2001.
2. Electromagnetic Waves and Radiating Systems – E.C. Jordan and K.G. Balmain, PHI, 2nd Edition, 2000.
3. Electromagnetic field theory and Transmission Lines – G.SasibhusanaRao,Wiley India Pvt.L

REFERENCES:

1. Electromagnetic Fields and Wave Theory –GSN Raju, Pearson Education 2006
2. Engineering Electromagnetics – William H. Hayt Jr. and John A. Buck, TMH, 7th ed., 2006.
3. Transmission Lines and Networks – Umesh Sinha, Satya Prakashan (Tech. India Publications), New Delhi, 2001.
4. Electromagnetic waves & Radiating Systems, Prentice Hall, India 3. Narayana Rao, N: Engineering Electromagnetics, 3rd ed., Prentice Hall, 1997.
5. Engineering Electromagnetics – William H. Hayt Jr. and John A. Buck, TMH, 7th ed., 2006

Course: Analog Circuits Lab
Code: V18ECL06

L	T	P	C
-	-	2	1

COURSE OUTCOMES:

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

CO 1- Construct circuit for linear wave shaping circuits. **[K3]**

CO 2- Construct feedback amplifiers and obtain their characteristics **[K3]**

CO 3- Construct different RC and LC oscillators using BJT based on the frequency range. **[K3]**

CO 4- Construct circuit and analyze different multivibrator circuits. [**K4]**

CO 5- Construct circuits for verifying linear and nonlinear applications using IC 741 op-amp and IC 555 timer [**K3]**

CO 6- Sketch the Frequency Response Characteristics of Active filters **[K3]**

Minimum Ten Experiments to be conducted:

1. Linear wave shaping
2. Non Linear wave shaping
3. Voltage-Series Feedback Amplifier
4. Class B Push-Pull Power Amplifier
5. RC Phase Shift/Wien Bridge Oscillator
6. Hartley/Colpitt's Oscillator
7. B istable Multi vibrator.
8. Summing, Scaling, Averaging amplifiers using IC 741.
9. Integrator and Differentiator Circuits using IC 741.
10. A stable Multi vibrator using IC 555.
11. Active Filters – LPF, HPF (first order)
12. 4 bit Digital to Analog Converter

Course: Communications Lab
Code : V18ECL05

L	T	P	C
-	-	2	1

COURSE OUTCOMES:

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

CO-1- Demonstrate the operation of various pulse modulation and demodulation techniques. **[K3]**

CO-2 -Construct the pre-emphasis and de-emphasis circuits and verify its frequency response. **[K3]**

CO-3 -Demonstrate the spectrum analysis of modulated signal using spectrum analyzer, operation of AGC and PLL **[K3]**

CO-4- Understand the Time division multiplexing and Demultiplexing, Pulse digital modulation techniques, such as PCM, DPCM, and DM, Companding theorem **[K2]**

CO-5- Understand generation and detection of digital modulation techniques, such as ASK, PSK, FSK and DPSK. **[K2]**

CO-6- Verify the Source encoding and decoding (Huffman Coding) technique and channel encoding and decoding techniques. **[K3]**

List of Experiments (Twelve experiments to be done)

A. Analog Communications
   1. Amplitude Modulation - Mod. & Demod.
   2. AM - DSB SC - Mod. & Demod.
   3. Spectrum Analysis of Modulated signal using Spectrum Analyser
   4. Pre-emphasis & De-emphasis
   5. Frequency Modulation - Mod. & Demod, PLL.
   6. Sampling Theorem - Pulse Amplitude Modulation - Mod. & Demod.
   7. PWM , PPM - Mod. & Demod.

B. Digital Communications
   1. Pulse code modulation, Differential pulse code modulation.
   2. Delta modulation, Companding.
   3. ASK, FSK, PSK.
   4. Differential phase shift keying.
   5. Source Encoder and Decoder
   6. Channel coding-
      i. Linear Block Code-Encoder and Decoder
      ii. Binary Cyclic Code – Encoder and Decoder
      iii. Convolution Code – Encoder and Decoder

III SEMESTER

Course : Digital Electronics

Code : V18ECT06

Branch: III Semester CSE

L	T	P	C
3	-	-	3

COURSE OUTCOMES:

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

1. Illustrate the conversion of a number from one number system to another. **[K3]**
2. Classify Boolean theorems & simplify the Boolean functions using the Boolean properties. **[K2]**
3. Use K-map as a tool to simplify and design logic circuits **[K3]**
4. Construct different combinational Logic circuits like MUX, Decoders, Encoders etc. **[K3]**
5. Demonstrate the basic flip-flops in terms of truth table & excitation table **[K2]**
6. Apply the concepts of flip-flops in the designing of different sequential circuits like registers, counters, etc. **[K3]**

UNIT1: Number systems& Binary codes:

Number systems: Number Systems, Radix conversions, complement of numbers. Binary codes: Binary codes, Weighted and non-Weighted codes, BCD code, gray code, excess 3 codes.

UNIT -II: Concept of Boolean algebra:

Basic Theorems and Properties of Boolean algebra, Boolean Functions, Canonical and Standard Forms, Minterms and Maxterms, Logic gates: NOT, OR, AND, NOR, NAND, XOR, XNOR - Universal gates.

UNIT- III: Gate level Minimization:

Map Method, Two-Variable K-Map, Three-Variable K-Map, Four Variable K-Maps. Products of Sum Simplification, Sum of Products Simplification, Don't – Care Conditions, NAND and NOR Implementation.

UNIT- IV:Combinational Logic:

Introduction, Analysis Procedure, Design Procedure, Binary Adder–Subtractor, Decimal Adder, Decoders, Encoders, Multiplexers.

UNIT V: **Sequential Logic Circuits**:

Introduction –Latches and Flip flops: Basic Flip flop circuit, RS, D, JK and T Flip-flops – Triggering of Flip flops: Master Slave Flip flop, edge triggered flip flop – Conversion of one type of Flip flop to another.

UNIT -VI: Registers and Counters:

Registers and Counters: Shift Register, Universal Shift Register, Applications of Registers, Asynchronous counter, Synchronous counter, Mod-N Counter, binary up/down counter, Ring counter, Johnson counter.

Memories: Introduction to ROM, PROM, EPROM.

TEXT BOOKS:

1. Digital Design, 5/e, M.Morris Mano, Michael D Ciletti, PEA.

2. Fundamentals of Logic Design, 5/e, Roth, Cengage.

REFERENCE BOOKS:

1. Digital Logic and Computer Design, M.Morris Mano, PEA.

2. Digital Logic Design, Leach, Malvino, Saha, TMH.

3. Modern Digital Electronics, R.P. Jain, TMH

Course : Digital Electronics Lab
Code : V18ECL04
Branch: III Semester CSE

L	T	P	C
-	-	2	1

COURSE OUTCOMES:

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

CO1: Apply the Boolean algebra to design digital logic circuits. **[K3]**
CO2: Analyse the behaviour of different combinational logic circuits. **[K4]**
CO3: Analyse the behaviour of different sequential logic circuits **[K4]**
CO4: Construct and troubleshoot simple combinational and sequential circuits **[K3]**

List of Experiments

Minimum Ten Experiments to be conducted:

Study of Integrated Circuits, Bread board& Power supplies.

1) Verification of Basic LogicGates
2) Verification of Universal Gates, Special Gates.
3) Verify the De-Morganlaws using CMOS IC's
4) Design a Gray code encoder & Decoder using IC 7486
5) Construct a Half Adder using IC's and verify the truth table.
6) Construct a Half Subtractor using IC's and verify the truth table.
7) Verify the truthtableof IC 74138(3x8 Decoder)
8) Verify the truthtable of IC 74153(4x1 MUX).
9) Verify the D Flip- Flop Using IC7474 with PRESET, CLEAR asynchronous Inputs.
10) Verify JK Flip- Flop & T Flip-Flop Using IC7476 with PRESET, CLEAR asynchronous Inputs.
11) Verify Decade counter using IC7490.
12) Design 4-bit right Shift Register using D-Flip-Flop and verify the truthtable.

Course : Analog Electronics
Code : V18ECT05
Branch: III Semester EEE

L	T	P	C
3	-	-	3

COURSE OUTCOMES:

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

CO 1: Explain the working principle of diode and Construct Diode rectifier circuits with and without filters. **[K2]**

CO 2: Sketch V-I characteristics of BJT and FET in different configurations. **[K3]**

CO 3: Explain the operation of Feedback Amplifiers and oscillators. **[K2]**

CO 4: Construct wave shaping circuits for various applications **[K3]**

CO 5: Construct circuits for different applications using ICs. **[K3]**

CO 6: Explain the operation of Data Converters using IC 741 OP-AMP. **[K2]**

UNIT-I: Junction diode characteristics and diode Applications: p-n junction diode, current components in PN junction Diode, derivation of diode equation, V-I Characteristics, Diode resistance, Diode capacitance. Zener Diode, Breakdown mechanisms Basic Rectifier setup**,** half wave rectifier, full wave rectifier, bridge rectifier, derivations of characteristics of rectifiers, rectifier circuits-operation, input and output waveforms, Filters, Inductor filter, Capacitor filter, L-section filter, π-section filter-, derivation for ripple factor in each case.

UNIT- II: Transistor Characteristics: BJT: Junction transistor, transistor current components, transistor equation, transistor configurations, transistor as an amplifier, and characteristics of transistor in Common Base, Common Emitter and Common Collector configurations, punch through/ reach through, typical transistor junction voltage values.

FET: FET types, construction, operation, characteristics, parameters, MOSFET-types, construction, operation, characteristics, comparison between JFET and MOSFET.

UNIT- III Feedback amplifiers and Oscillators: Voltage series, current series, voltage shunt, current shunt feedback amplifiers, effect of negative feedback. Oscillators: Basic concept, Barkhausen criterion, RC oscillators (phase shift, Wien bridge), LC oscillators (Hartley, Colpitts)

UNIT- IV Wave shaping circuits: Response of high pass and low pass RC circuits to step, pulse inputs. High pass RC circuit as differentiator, low pass RC circuit as integrator. Series and shunt clippers, clipping at two independent levels, Positive and Negative Clampers. Introduction to multivibrators: Bistable, Monostable and Astable Multivibrators.

UNIT- V Integrated Circuits and applications: Op-amp Block Diagram, Ideal Op-amp, Equivalent Circuit, Power supplies, Ideal voltage transfer curve, open loop op-amp configurations. Inverting and non-inverting amplifiers, summing, scaling, averaging amplifier, integrator and differentiator, 555 timer functional block diagram, Astable and Monostable multivibrators.

UNIT- VI Data Converters: Weighted resistor DAC, R-2R ladder DAC. Flash Type ADC, Counter type ADC, Successive approximation ADC, Dual slope ADC,. Specifications of DAC&ADC.

Text Books:

1. Integrated Electronics- J. Millman and C.C. Halkias, TMH
2. Electronic Devices and Circuits- Salivahanan, N.Suresh Kumar, A. Vallavaraj, TMH
3. Pulse, Digital and Switching Waveforms - J. Millman and H. Taub, TMH
4. Linear Integrated Circuits – D. Roy Choudhury, 4th edition, New Age International (p) Ltd.
5. Op-Amps & Linear Integrated Circuits - Ramakanth A. Gayakwad,3rd edition, PHI.

References :

1. Electronic Devices and Circuits Theory – Robert L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall.
2. Electronic Circuit Analysis - B.V.Rao, K.R.Rajeswari, P.C.R.Pantulu, K.B.R.Murthy, Pearson Publications.
3. Pulse & Digital Circuits-BN Yoga Narasimhan, 2000,Sri Maruthi Publishers, Bangalore.
4. Operational Amplifiers & Linear Integrated Circuits –Sanjay Sharma ;SK Kataria &Sons;2nd Edition,2010

L	T	P	C
-	-	2	1

Course: Analog Electronics Lab
Code : V18ECL03
Branch: III Semester EEE

COURSE OUTCOMES:

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

CO-1: Interpret the Characteristics of various semiconductor devices. **[K2]**
CO-2: Examine the Performance of Rectifiers with and without Filters. **[K3]**
CO 3: Construct circuit for linear wave shaping circuits. **[K3]**
CO 4**:** Construct different RC and LC oscillators using BJT based on the frequency range. **[K3]**
CO 5**-** Construct circuits for verifying linear and nonlinear applications using IC 741op-amp and IC 555 timer [**K3]**
CO 6**-** Verify the Characteristics of 4 bit Digital to Analog Converter **[K3]**

List of Experiments:

1. P-N Junction Diode Characteristics
   Part A: Germanium Diode (Forward bias only)
   Part B: Silicon Diode (Forward & Reverse bias)
2. Rectifiers (without and with c-filter)
   Part A: Half-wave Rectifier
   Part B: Full-wave Rectifier
3. Zener Diode Characteristics
   Part A: V-I Characteristics
   Part B: Zener Diode as Voltage Regulator
4 BJT Characteristics (CE Configuration)
   Part A: Input Characteristics
   Part B: Output Characteristics
5 FET Characteristics (CS Configuration)
   Part A: Drain Characteristics
   Part B: Transfer Characteristics.
6 Linear wave shaping
7 Non Linear wave shaping
8 RC Phase Shift/Wien Bridge Oscillator
9 Hartley/Colpitt's Oscillator
10 Integrator and Differentiator Circuits using IC 741
11 A stable Multi vibrator using IC 555
12 4 bit Digital to Analog Converter

Appendix-ECE-04

Course Structure for Electronics and Communication Technology (ECT) Programme

I SEMESTER

S.No	Course Code	Course Name	L	T	P	C
1	V18ENT01	English – I	2	-	-	MNC
2	V18MAT01	Engineering Mathematics – I	3	1	-	4
3	V18CHT01	Engineering Chemistry	3	1	-	4
4	V18CST01	Programming in C for problem solving	3	-	-	3
5	V18MET01	Engineering Graphics	1	-	3	2.5
6	V18ENL01	English Communication Skills Lab – I	-	-	2	MNC
7	V18CSL01	Programming lab in C for problem solving	-	-	3	1.5
8	V18CHL01	Engineering Chemistry Lab	-	-	3	1.5
Total			12	2	11	16.5

Total Contact Hours: 25 Total Credits: 16.5

II SEMESTER

S.No	Course Code	Course Name	L	T	P	C
1	V18ENT02	English – II	2	-	-	2
2	V18MAT02	Engineering Mathematics – II	3	1	-	4
3	V18PHT02	Opto Electronics and Semi Conductors for EEE & ECE	3	1	-	4
4	VI8EET02	Basic Electrical Engineering for ECE	3	1	-	4
5	V18CHT02	Environmental Studies for ECE	3	-	-	MNC
6	V18ENL02	English Communication Skills Lab – II	-	-	2	1
7	VI8EELO2	Basic Electrical Engineering Lab for ECE	-	-	3	1.5
8	V18PHL02	Opto Electronics and Semi Conductors lab for ECE	-	-	3	1.5
9	VI8MELO1	Engineering and IT Workshop				
Total			12	2	11	19.5

Total Contact Hours: 25

Annexure-IV

Minutes of the meeting, BOS of MBA (Held on 16.04.2019)

The chairman of the BOS extended a formal welcome and introduced the members.

The following are the members of BOS of Management Studies (MBA)

S.No	Name of the member	Designation	
1	Dr.G.V.Subba Raju	Professor & HOD; DMS Sri Vasavi Engg.College	Chairman BOS
2	Prof. B. Amarnath	Professor & Registrar, Rayalaseema University, Kurnool	Council Nominee
3	Dr.J.N.V.Raghu Ram	Associate Professor, Department of Technology Management, VIT, Vellore	Council Nominee
4	Sri. P.S. Varma	D G M, Coromandel International Limited, Kakinada	Industry expert
5	Prof. D. Surya Chandra Rao	Professor Department of Management Studies, Krishna University, Director, RGVKT, Nuzvid. Machilipatnam	University Nominee
Department of Management Studies, Sri Vasavi Engineering College members			
6	V.Kiran Kumar	Associate Professor	Member
7	Dr. S. Krishna Murthy Naidu	Associate Professor	Member
8	Dr.RSRK Kiran Kumar	Associate Professor	Member
9	D.Satyanarayana	Sr. Asst.Professor	Member
10	D. Naveen Kumar	Asst. Professor	Member
11	R.V.Rajasekhar	Asst. Professor	Member
12	V. Saranya	Asst. Professor	Member

13	U. Bhargava	Asst. Professor	Member
14	Dr.R.S.V.Rama Swathi	Asst. Professor	Member
15	E. Suresh	Asst. Professor	Member
16	Dr. K.Rambabu	Asst. Professor	Member
17	K.V.Malleswari	Asst. Professor	Member

Item 1: Syllabi approval for MBA 3rd and 4th Semester Courses for the academic year 2019-20.

The Chairman of BOS proposed the syllabi for MBA 3rd and 4th Semester for the academic year 2019-20. After considering the suggestion made by all BOS members, the courses syllabi for MBA (Autonomous) programme has been approved. The approved syllabi copies are enclosed as **Appendix-MBA-01**

Item 2: Syllabi approval for Managerial Economics and Financial Analysis for the Academic year 2019-20.

The syllabus for Managerial Economics and Financial Analysis for the academic year 2019-20 has been approved by BOS members. The approved syllabi copy is enclosed as **Appendix-MBA-02**

Item 3: Review of MBA 1st Semester (2018-19 (Autonomous)) Admitted batch results.

MBA 1st Semester results of 2018-19 (Autonomous) admitted batch are presented by the Chairman.

End Semester examination results

No. Students registered	No. of students passed	Pass percentage
58	43	74.14%

All BOS members have expressed their satisfaction on the pass percentage and performance of students in examinations.

Item 4: Any other academic item

The course codes of Employability Skills III (Aptitude-1), Employability Skills IV (Aptitude-2) changed as V18MAT07 and V18MAT08 respectively. This courses syllabus is approved by BOS in Mathematics.

Appendix-MBA-01

Semester-I

SNo	Course Code	Course	L	P	C	I	E	TM
1	V18MBT01	Management Theory & Organizational Behaviour	4	--	4	40	60	100
2	V18MBT02	Managerial Economics	4	--	4	40	60	100
3	V18MBT03	Accounting for Managers	4	--	4	40	60	100
4	V18MBT04	Indian Economy & Policy	4	--	4	40	60	100
5	V18MBT05	Business Communication	4	--	4	40	60	100
6	V18MBT06	Quantitative Analysis for Business Decisions	4	--	4	40	60	100
7	V18MBL01	IT-LAB	---	6	3	40	60	100
8	V18ENT13	Employability Skills I (English Communication Skills)	2	--	--	--	--	MNC
		TOTAL	26	6	27	280	420	700

Semester-II

SNo	Course Code	Course	L	P	C	I	E	TM
1	V18MBT07	Financial Management	4	--	4	40	60	100
2	V18MBT08	Human Resource Management	4	--	4	40	60	100
3	V18MBT09	Marketing Management	4	--	4	40	60	100
4	V18MBT10	Production and Operations Management	4	--	4	40	60	100
5	V18MBT11	Business Research & Statistical Analysis	4	--	4	40	60	100
6	V18MBT12	Legal Environment for Business	4	--	4	40	60	100
7	V18MBT13	Business Ethics & Corporate Governance	4	--	4	40	60	100
8	V18ENT14	Employability Skills II (Soft Skills)	2	--	--	--	--	MNC
		TOTAL	30	--	28	280	420	700

Semester-III

SNo	Course Code	Course	L	P	C	I	E	TM
1	V18MBT14	Business Policy & Corporate Strategy	4	--	4	40	60	100
2	V18MBT15	Entrepreneurship Development	4	--	4	40	60	100
3	V18MBT16	E-Business	4	--	4	40	60	100
4		Elective-1	4	--	4	40	60	100
5		Elective-2	4	--	4	40	60	100
6		Elective-3	4	--	4	40	60	100
7		Elective-4	4	--	4	40	60	100
8	V18MBM01 / V18MBP01	MOOCs/ Mini Project	--	--	--	--	--	MNC
9	V18MAT07	Employability Skills III (Aptitude -1)	2	--	--	--	--	MNC
		TOTAL	30	--	28	280	420	700

Semester-IV

SNo	Course Code	Course	L	P	C	I	E	TM
1	V18MBT29	Logistics & Supply Chain Management	4	--	4	40	60	100
2	V18MBT30	Business Analytics	3	4	4	40	60	100
3		Elective-5	4	--	4	40	60	100
4		Elective-6	4	--	4	40	60	100
5		Elective-7	4	--	4	40	60	100
6		Elective-8	4	--	4	40	60	100
7	V18MBP02	Major Project & Viva voce	--	--	6	40	60	100
8	V18MAT08	Employability Skills IV (Aptitude-2)	2	--	--	--	--	MNC
		TOTAL	25	04	30	280	420	700
		GRAND TOTAL	111	10	113	1120	1680	2800

L-LECTURE HOURS, P-PRACTICAL HOURS, C-CREDITS, I-INTERNAL MARKS, E-EXTERNAL MARKS, TM-TOTAL MARKS,MNC-

MNC: Mandatory Non credit course

Single Specialization:

The Specialization papers will be offered in the areas of Marketing, Finance, and Human Resource Management (HRM). The students should choose any **one** of the listed Specialization areas in the beginning of the third semester of MBA. Specialization will be offered subject to a minimum of 20 students.

Semester-III

Specialization I: Marketing

S.No.	*Course Code*	*Course*
1	V18MBT17	Consumer Behavior
2	V18MBT18	Retail Management
3	V18MBT19	Integrated Marketing Communication
4	V18MBT20	Product & Brand Management

Specialization II: Finance

S.No.	*Course Code*	*Course*
1	V18MBT21	Security Analysis & Portfolio Management
2	V18MBT22	Advance Management Accounting
3	V18MBT23	Financial Markets & Services
4	V18MBT24	Banking & Insurance Management

Specialization III: HRM

S.No.	*Course Code*	*Course*
1	V18MBT25	Human Resource Planning & Development
2	V18MBT26	Compensation and Reward Management
3	V18MBT27	Performance Management
4	V18MBT28	Strategic Human Resource Management

Semester-IV

Specialization I: Marketing

S.No.	*Course Code*	*Course*
5	V18MBT31	Services Marketing
6	V18MBT32	Sales and Distribution Management
7	V18MBT33	Digital & Social media Marketing
8	V18MBT34	International Marketing Management

Specialization II: Finance

S.No.	*Course Code*	*Course*
5	V18MBT35	Financial Derivatives
6	V18MBT36	Project Appraisal and Finance
7	V18MBT37	Business Taxation & Planning
8	V18MBT38	International Financial Management

Specialization III: HRM

S.No.	*Course Code*	*Course*
5	V18MBT39	Organizational Change & Development
6	V18MBT40	Management of Industrial Relations
7	V18MBT41	Labour Welfare & Legislations
8	V18MBT42	International HRM

V18MBT14: BUSINESS POLICY & CORPORATE STRATEGY

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

CO1: Understand the concept of business policy and strategic management in detail

CO2: To get familiarity with various tools for appraising an organization's external environment.

CO3: Analyze various strategies formulated at corporate, business and functional levels.

CO4: To understand strategy implementation procedure in detail.

CO5: Evaluate the performance of strategies designed and applied at various levels of a business.

UNIT 1

Introduction: The concept and evolution of Business Policy- Vision, Misssion and Objectives- Difference between business policy and strategic management. Corporate governance- concept, issues, models, evolution and significance. Introduction to Strategic Management-Concept importance of strategic Management, Strategy & Competitive Advantage, Strategy Planning & Decisions, strategic Management Process.

UNIT 2

Environmental Scanning and leadership: External Environment Appraisal using PESTEL, Competitor Analysis using Porter's 5-Forces model, Environmental Threat and Opportunity Profile (ETOP), Porter Value chain Analysis, Scanning Functional Resources and Capabilities for building Organization Capability Profile (OCP), SWOT Analysis. Key strategic leadership actions.

UNIT 3

Strategy Formulation: Strategic alternatives at corporate level: concept of grand strategies, Strategic choice models - Strickland's Grand Strategy Selection Matrix, Model of Grand Strategy Clusters, BCG, GE Nine Cell Matrix Strategic alternatives at business level: Michael Porter's Generic competitive strategies, Formulation of strategy at corporate, business and functional levels. Red Ocean and Blue Ocean Strategies

UNIT 4

Strategy Implementation: Developing short-term objectives and policies, functional tactics, and rewards, Structural Implementation: an overview of Structural Considerations Behavioral Implementation: an overview of: Leadership and Corporate Culture Mc Kinsey 7-S Framework.

UNIT 5

Strategy Evaluation and control – Establishing strategic controls - Measuring performance – appropriate measures- Role of the strategist – using qualitative and quantitative benchmarking to evaluate performance - strategic information systems – problems in measuring performance – Strategic surveillance -strategic audit Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. Vijaya Kumar P,.Hitt A: **Strategic Management**, Cengage learning, NewDelhi,2010
2. John A PearceII, AmitaMital: "**Strategic Management**", TMH, New Delhi,2012.Mohapatra: "**Cases Studies in Strategic Management**", Pearson, NewDelhi,2012
3. Adrian Haberberg&Alison: **Strategic Management**, Oxford University Press, NewDelhi, 2010
4. P.SubbaRao: "**Business Policy and Strategic Management**" Text and Cases,Himalaya Publishing House, New Delhi,2011
5. AppaRao, ParvatheshwarRao, Shiva Rama Krishna: "**Strategic Management and Business Policy"**, Excel Books, New Delhi,2012

V18MBT15: ENTREPRENEURSHIP DEVELOPMENT

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

CO1: Understand the foundations of Entrepreneurship and its importance.

CO2: Develop viable business ideas and understand entrepreneurial eco system.

CO3: Develop new projects and preparation of detailed project report.

CO4: Understand the importance of MSME's in the economic development of a nation.

CO5: Identify various sources of Entrepreneurial support organizations.

UNIT 1

Entrepreneurship: Importance and growth - Characteristics and Qualities of Entrepreneur- Role of Entrepreneurship, Ethics and Social Responsibilities. Women Entrepreneurship: Role & Importance, Problems of Women Entrepreneurs, Opportunities for women entrepreneurs – corporate entrepreneurship – mobility of entrepreneur – entrepreneurial motivation.

UNIT2

Innovation: Sources of business idea-Idea generation- Ideal validation- idea screening process- market sizing techniques- innovation and creativity for aspiring entrepreneurs- incubation- startup eco system

UNIT 3

Planning and Evaluation of Projects: Growth of Firm – Project identification and selection - Factors inducing growth- - Project Feasibility Study – Elements of a project report- preparation of DPR. Post Planning of Project-Project Planning and Control.

UNIT 4

Small and Micro Enterprises: Importance, definitions – policies and their support to MSMEs - growth and growth strategies – registration process of MSME- MSMED Act 2006.

UNIT 5

Institutional Support to Entrepreneur and MSMEs: Role of Government - Role of SIDBI, NIESBUD, SISI, DIC,NSIC, TCOs, role of DST in technology entrepreneurship- Financial Institutions-Commercial Banks, Entrepreneurial Development Institutes.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. Arya Kumar: "Entrepreneurship", Pearson, Publishing House, New Delhi,2012.
2. VSP Rao, Kuratko: "Entrepreneurship', Cengage Learning, NewDelhi,
3. K.Ramachandran: "Entrepreneurship Development", TMH, New Delhi, 2012
4. 4.B.Janakiram, M Rizwana: "Entrepreneurship Development" Excel Books, New Delhi,2011 Rajeev Roy: "Entrepreneurship", Oxford University Press, NewDelhi,2012

5. 5.P.C.Shejwalkar: “Entrepreneurship Development”, Everest Publishing House, NewDelhi, 2011

V18MBT16: E-BUSINESS

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

CO1: Understand the foundations and importance of E-commerce.

CO2: Analyze the impact of e-commerce on business models and strategy.

CO3: Apply the systems used in e-business in real life situations.

CO4: Discriminate the impact of e-Commerce on Business to Consumer, Business-to-Business and Intra-organizational levels.

CO5: Create a new online business with profound knowledge on launching process.

Unit 1:

Introduction to e-Business and e-Commerce: Define the e-Commerce and e-Business, Define e- Commerce- Types of transactions. Define e-Business Models. Internet Marketing and e-Tailing.Elements of e-Business Models. Explain the benefits and limitations of e-Commerce.

Unit 2:

E-Marketplaces: Structures, Mechanisms, Economics, and Impacts: Define e-Marketplace and Describe their Functions. E-Business models of companies like amazon, flipkart, alibaba, foodpanda, etc. e-Marketplace types and their features. Describe the various types of e-auctions and list their characteristics.

Unit 3:

E-Business Applications, e-Procurement and e-Payment Systems: Integration and e-Business suits, ERP, e-SCM, CRM, e-Procurement definition, processes, methods and benefits, e-Payment, Discuss the categories and users of smart cards, Describe payment methods in B2B EC.

Unit 4:

The Impact of e-Business on Different Fields and Industries: e-Tourism, Employment and Job Market Online, Online Real Estate, Online Publishing and e-Books, e-Banking and Personal Finance Online, On-Demand Delivery Systems and E-Grocers, Online Delivery of Digital Products, Entertainment, and Media

Unit 5:

Launching a Successful Online Business and EC Projects- Requirements for starting an online business from different perspectives- Funding options available to start up businesses. -Processes associated with managing Web site development -Techniques of search engine optimization. Evaluate Web sites on design criteria.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Electronic Commerce: A Managerial Perspective, Turban, E. et al., Prentice Hall

2. Electronic Business and Electronic Commerce Management, 2nd edition, Dave Chaffey, Prentice Hall,
3. e-Learning Tools and Technologies, Horton and Horton, Wiley Publishing.

V18MBT17: CONSUMER BEHAVIOR

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

1. Analyze and determine the behavior of consumer.
2. Describe consumer perception and attitude.
3. Understand the factors influencing consumer behavior.
4. Know the importance of communication on consumer behavior
5. Able to identify the roots of consumerism.

UNIT-1

Introduction to Consumer Behavior:

Understanding consumers and market segments. Evolution of concept of consumer behavior, consumer analysis and business strategy. Models of Buyer Behavior, Howard Model, Howard- Sheth Model, EKB Model, Webster and Wind Model and Sheth Industrial Buyer Behavior Model

UNIT-2

Psychological Foundations of Consumer Behavior:

Consumer Motivation, Perception, Personality and Behavior, Learning and Behavior Modification, Information Processing, Memory Organization and Function, Attitude Formation and Attitude Change.

UNIT-3

Consumer Behavioral **Influences:**

Social and Cultural Environment Economic, Demographic, Cross Cultural and Socio–Cultural Influences, Social Stratification, Reference Groups and Family, Personal influence

UNIT-4

Communication and Consumer Behavior:

Components of communications process, designing persuasive communication and Diffusion of Innovations. Consumer Decision Processes High and Low Involvement, Pre-purchase Processes, Post Purchase processes, Consumption and evaluation, Brand Loyalty and Repeat Purchase Behavior

UNIT-5

Consumerism:

The roots of consumerism, consumer safety, consumer information, Environmental concerns, consumer privacy, legislative responses to consumerism and marketer responses to consumer issues

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. Ramneek Kapoor, Nnamdi O Madichie: “Consumer Behavior” Text and Cases”, TMH, New Delhi, 2012.
2. Ramanuj Majumdar: “Consumer Behavior insight from Indian Market”, PHI Learning,
3. New Delhi, 2011
4. M.S.Raju: “Consumer Behavior Concepts, applications and Cases”, Vikas Publishing
5. House, New Delhi, 2013.

6. David L Loudon and Albert J Della Bitta, “Consumer Behavior” 4/e, TMH, New Delhi,
7. 2002.
8. Schiffman, L.G and Kanuk L.L “Consumer Behavior”, 8/e, Pearson Education, New Delhi, 2003.

V18MBT18: RETAIL MANAGEMENT

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

1. Understand the basic structure of Retail business in India.
2. Gain Knowledge in designing Retail strategies.
3. Interpret the importance of location in making a retail business successful.
4. Apply basic operations in retail business in real life environment.
5. Examine the technical and financial aspects of retail business besides report preparation.

UNIT 1

Basics of Retailing: Retail and Retailing, Functions of Retailers, Types of Retailers, Benefits of a self service store, Evolution of Modern Retail, Understanding Barcoding, Multi-channel Retailing, Product assortment.

UNIT 2

Retail Strategies : Building sustainable competitive advantage, Strategic Retail planning process, Merchandising principles, Smart Pricing, Purchasing staples and branded FMCG items, Manpower planning and scheduling, Circle of Retail life

UNIT 3

Retail Location: Types, Location advantages, Finding the right place, core catchment area, Getting the right layout, Strategic profit model.

UNIT 4

Store operations : Inventory Management, Plan-O-Gram, Store manager routine and checklist, The cashier process, Cash management at Till, Billing process, Managing pilferage, Customer relationship management, periodic stock taking, Day-to-day security and loss prevention.

UNIT 5

Retail Monetary actions: Costs of running a supermarket, Key performance Indicators, Category Management, Retail automation, MIS and business reports, Licenses and permissions required.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. A.J.Lamba (2011): “The Art of Retailing”, Tata McGraw Hill Education Pvt Ltd, New Delhi
2. Sivakumar A (2007): “Retail Marketing”, Excel Books, New Delhi.
3. Sheikh and Kaneez Fatima (2012): “Retail Management” Himalaya publishing house, Mumbai.
4. Swapna Pradhan (2012): “Retail Management”, Tata McGraw Hill, New Delhi.

V18MBT19: INTEGRATED MARKETING COMMUNICATION

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

1. To familiarize the students with concepts and practices in marketing communication.
2. To learn various communication tools and its effectiveness in contemporary times.
3. Draw a lesson from that knowledge for better integration of various marketing communication tools.
4. Understand the procedure for designing an integrated marketing communication programme.
5. Bring out creative ideas for effective marketing communication

Unit I:

An Introduction to Integrated Marketing Communication (IMC): Meaning and role of IMC in Marketing process, one voice communication V/s IMC. Introduction to IMC tools – Advertising, sales promotion, publicity, public relations, and event sponsorship; The role of advertising agencies and other marketing organizations providing marketing services and perspective on consumer behaviour.

Unit II:

Understanding communication process: Source, Message and channel factors, Communication response hierarchy- AIDA model, Hierarchy of effect model, Innovation adoption model, information processing model, The standard learning Hierarchy, Attribution Hierarchy, and low involvement hierarchy Consumer involvement- The Elaboration Likelihood (ELM) model, The Foote, Cone and Belding (FCB) Model.

Unit III:

Planning for Marketing Communication (Marcom): Establishing marcom Objectives and Budgeting for Promotional Programmes-Setting communication objectives, Sales as marcom objective, DAGMAR approach for setting ad objectives. Budgeting for marcom-Factors influencing budget, Theoritical approach to budgeting viz. Marginal analysis and Sales response curve, Method to determine marcom budget.

Unit IV:

Developing the Integrated Marketing Communication Programme: Planning and development of creative marcom. Creative strategies in advertising, sales promotion, publicity, event sponsorships etc. Creative strategy in implementation and evaluation of marcom- Types of appeals and execution styles. Media planning and selection decisions- steps involved and information needed for media planning.

Unit V:

Measuring Effectiveness and control of Promotional Programmes: Meaning and importance of measuring communication effectiveness, The testing process,

measuring the effectiveness of other promotional tools and IMC. The ethical, social, and legal aspects of advertising and promotion-, Social Communication Different legislative and self regulatory codes controlling advertising and promotions in India viz. advertising councils code, print media codes, broadcasting media codes and regulations governing sales promotion, packaging, direct marketing and internet marketing

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Integrated Marketing Communications – Kenneth Clown& Donald Bach
2. Advertising and Promotions – Belch & Belch, Tata McGraw Hill
3. Advertising Management – Rajeev Batra, John G.Myers& David A Aaker-PHI
4. Otto Kleepner's advertising Procedure – PH
5. International Edition – Contemporary Advertising Irwin/McGraw -Hill
6. Integrated Marketing Communications – Duncon- TMH
7. Foundations of Advertising Theory & Practice

V18MBT20: PRODUCT & BRAND MANAGEMENT

L	T	P	C
4	0	0	4

COURSE OUTCOMES

At the end of the course students would be able to:

1: Understand the basic product structure and its components for market place.

2: Match the needs of the consumers in developing a new product.

3: Rephrase the concept of Brand and its applicability in the current market conditions.

4: Apply the concept of branding in real life market situations.

5: Understand core brand mantras for successful launch of a product.

UNIT 1

Introduction to Product: Product, Levels of a Product, Classification of products, Major Product decisions, Product Life Cycle, Product mix decisions, Consumer Adoption process.

UNIT 2

Product Development: New Product Development Process, Ideation, Concept development, Concept testing, Commercialization, Standard Test markets, controlled test markets and Simulated test markets, Managing New product development.

UNIT 3

Introduction to Branding: Concept of Brand and Branding, Brand Equity, Brand equity models, Building strong brands, Brand positioning, Brand Sponsorships.

UNIT 4

Brand Development: Functions of Brand to Consumer, Role of Brand in the product success, Brand development strategies, Brand Management Process, Brand Associations.

UNIT 5

Brand Value: Definition, Core Brand values, Branding and Ethics, Brand Mantras, Internal Branding, Brand Value chain model, Brand Imitations.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Tapan K Panda (2016): “Product and Brand Management”, Oxford University Press.
2. Chitale A K (2013): “Product policy and Brand Management”, PHI Publications, New Delhi.
3. U C Mathur (2012): “Product and Brand Management” Excel Books, New Delhi.
4. Kirti Dutta (2012): “Brand Management: Principles and Practices”, Oxford University Press.
5. Harsh V Verma(2012): “Brand Management:Text and Cases” Excel Books, New Delhi.

V18MBT21: SECURITY ANALYSIS & PORTFOLIO MANAGEMENT

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

1. Understand the environment of share markets and trading system is stock exchanges.
2. Find the relationship between risk and return. Value the equities and bonds
3. Learn about fundamental, technical and efficient market approaches.
4. Identify portfolio selection through different portfolio theories.
5. Apply various tools to analyse the performance of mutual funds.

Unit-I: Concept of Investment Education: Investment Vs Speculation, Investment alternatives - Investment Process – Trading System in Stock Exchanges –Market Indices. Calculation of SENSEX and NIFTY - Return and Risk – Meaning and Measurement of Security Returns. Meaning and Types of Security Risks: Systematic Vs Non-systematic Risk - Measurement of Risk. (Problems)

Unit-II: Equity and Bond Valuation Models: – Equity Shares valuation-Cash flow valuation-Asset Valuation-Dividend-discount model; concept of Bond. Zero coupon bond, YTM, YTC. Bond valuation (Simple Problems)

Unit-III: Investment Analysis: Fundamental Analysis – Economy, Industry and Company Analysis, Technical Analysis – Dow Theory – Elliot Wave Theory – Trends and Trend Reversals - Efficient Market Theory –Hypothesis- Forms of Market Efficiency.

Unit-IV: Portfolio Analysis and Selection: Elements of Portfolio Management, Portfolio Models – Markowitz Model, Efficient Frontier and Selection of Optimal Portfolio. Sharpe Single Index Model (SIM) and Capital Asset Pricing Model (CAPM).

Unit-V: Portfolio Evaluation of Mutual funds: Concept and Objectives, Functions and Classification of Mutual Funds- SEBI- Guidelines for Mutual Funds, Performance Evaluation of Portfolios; Sharpe- Jenson – Fama Models for Evaluation of Mutual funds (Problems).

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. S.Kevin: “Security Analysis and Portfolio Management”, PHI Learning, New Delhi, 2009
2. Punithavathy Pandian: “Security Analysis and Portfolio Management”, Vikas Publishing House, N
3. Sudhendra Bhat: “Security Analysis and Portfolio Management”, Excel Books, New Delhi, 2009.
4. Shashi K Gupta: “Security Analysis and Portfolio Management”, Kalyani Publishers, New Delhi,2010
5. Prasanna Chandra, “Investment Analysis and Portfolio Management”, 3/e Tata McGrawHill Publishing Co. Ltd. New Delhi, 2003.

6. Ranganatham : "Investment Analysis and Portfolio Management" Pearson Education. New Delhi, 2009.

V18MBT22: ADVANCED MANAGEMENT ACCOUNTING

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

1. Understand the nature, objectives and importance of advanced management accounting
2. Find optimum pricing, product-mix make or buy decisions through marginal costing.
3. Learn about standard costing and variance analysis
4. Prepare different types of budgets
5. Aware of contemporary practices in the area of advanced management accounting

Unit – 1: Introduction: Scope, objectives, importance and limitations of Employment of Management Accounting — Role, duties and responsibilities of Management Accountant. Essentials of reporting of management accounting.

Unit - 2: Marginal Costing: Significance of marginal costing. Cost volume profit-BEP analysis – Decision Situations-Sales Volume Decisions – Pricing and Special Order Pricing – Make / Buy Decisions – Product Mix Decisions-– Plant Shutdown Decision Profit Planning – planning of level of activity – Key factor – Foreign market offers.

Unit - 3: Standard Costing: Standard Costing and Absorption costing – Establishment of cost standards. Variance analysis: Material Variances – Labour Variances – Overhead Variances - Sales Variances

Unit- 4: Budgetary Control: – Objectives and advantages of Budgetary control. Types of various budgets. Preparation of Budgets – Purchase, Production, Sales and Cash Budget- Flexible Budget – Master Budget – Zero Based Budgeting.

Unit – 5: Contemporary issues in Management Accounting: Value analysis-Activity based costing-Social cost benefit analysis-Kaizen costing-Throughput costing-Target costing-Learning curve.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Charles T. Horn Gaxy L. Sundem.: "Introduction to Management Accounting" Konrk Publishers PVT Ltd, New Delhi.

2. S.P. Gupta: "Management Accounting" Sahitya Bhawan Publications, Agra 2002.

3. Manmohan and Goyal: "Management Accounting" Pearson Education.

4. V. Krishna Kumar: "Management Accounting" Mittal Publications, New Delhi.

5. Dr. Kulsreshtha and Gupta: "Practical Problem in Management Accounting" Tata Mc Graw Hill, New Delhi.

6. S.P. Jain and K.L. Narang: "Advanced Cost and Management Accounting" Kalyani Publishers, New Delhi.

V18MBT23: FINANCIAL MARKETS & SERVICES

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

1. Understand the structure of Indian financial system
2. Get awareness on the financial services and function of merchant banker.
3. Understand the function of Venture capital and lease financing
4. Describe the functions of various NBFCs
5. Understand the functions of security deposits and stock broking houses

Unit I: Indian Financial System , Financial Markets: Structure of Financial System – role of Financial System in Economic Development – Financial Markets :Capital Markets – Money Markets – Primary Market and Secondary Market – Role of SEBI – Secondary Market Operations – Regulation – Functions of Stock Exchanges – Listing – Formalities – Financial Services Sector- Problems and Reforms.

Unit –II: Financial Services: Concept , Scope of Financial Services – Regulatory Frame Work of Financial Services – Growth of Financial Services in India – Merchant Banking – Meaning-Types – Responsibilities of Merchant Bankers – Role of Merchant Bankers in Issue Management – Regulation of Merchant Banking in India.

Unit III: Venture Capital and Leasing: – Growth of Venture Capital in India – Financing Pattern under Venture Capital – Legal Aspects and Guidelines for Venture Capital, Leasing – types of Leases – Evaluation of Leasing Option Vs. Borrowing.

Unit IV: NBFCs: Credit Rating – Meaning, Functions – Debt Rating System of CRISIL, ICRA and CARE. Factoring, Forfeiting and Bill Discounting – Types of Factoring Arrangements – Factoring in the Indian Context;

Unit V: Stock Broking and Security Depository: Concept of Stock Broking, Evolution of stock broking business, functions of stock broking firm- Regulatory guidelines of SEBI on stock broking business- Debt Securitization – Concept and Application – De-mat Services-need and Operations-role of NSDL and CSDL.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. Bhole & Mahakud, Financial Institutions and Market, TMH, New Delhi
2. V.A.Avadhani, Marketing of Financial Services, Himalayas Publishers, Mumbai
3. DK Murthy, and Venugopal, Indian Financial System, IK Int Pub House
4. Anthony Saunders and MM Cornett, Fin Markets & Institutions,TMH, ND
5. Edminister R.D., Financial Institution, Markets and Management:
6. Punithavathy Pandian, Financial Markets and Services, Vikas, New Delhi

7. Vasanth Desai, Financial Markets & Financial Services, Himalaya, Mumbai
8. Meir Khan – Financial Institutions and Markets, Oxford Press.
9. Madura, Financial Markets & Institutions, Cengage, ND

V18MBT24: BANKING & INSURANCE MANAGEMENT

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

1. Interpret the basic institutional and practical knowledge of Banking and Insurance
2. Apply the practical knowledge of bank credit system and non-performing assets in real scenario.
3. Ability to recognize the new innovations and regulations in the banking sector
4. Ability to interpret the types of insurance and its importance.
5. Understand the concept of general insurance and its practical applicability.

UNIT 1

Introduction to Banking: Meaning of a Bank and Customer- Bank and customer Relationship - Role of commercial banks in Economic Development - Evolution of Banking in India – origin, nationalization, reforms and Financial Inclusion in India - Financial statement analysis of banks: CAMEL Approach, Key Performance indicators- Sources of Bank Funds.

UNIT 2

Uses of Bank Funds: Features of Bank Credit - types of lending - assessment of credit worthiness of a prospective borrower - management of credit process - different types of loans and their features - Non Performing Assets: - gross and net concept of NPAs, causes, implications & recovery of NPAs.

UNIT 3

Regulation and Innovations in Banking System: Regulation of Bank Capital: The need to regulate Bank Capital - Concept of Regulatory Capital, Basel Accords I,II and III. - Banking Innovations - Core Banking Solution - Retail Banking - Products & Services: Plastic Money - National Electronic Funds Transfer - ATM - Mobile Phone Banking - Net Banking- Banc-assurance.

UNIT 4

Introduction to Insurance: Evolution of insurance business in India-Insurance as a Risk Management Tool- Principles of Insurance - Characteristics of Insurance contract - Functions of Insurers - Concept of Reinsurance, uses and advantages - Marketing channels: Agents & brokers –professionalism, remuneration, responsibilities, classification - an overview of IRDA.

UNIT 5

Life Insurance and General Insurance: The concept of Life Insurance - types of Life Insurance contracts - Tax treatment of Life Insurance- Life Insurance Products- Classification of Life Insurance - The Actuarial Science- Provisions of Life Insurance contracts - Special Life Insurance forms – General Insurance: **Health Insurance, Travel Insurance, Motor Insurance – Marine Insurance-** Micro Insurance in India.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Peter.S.Rose & Sylvia. C. Hudgins: "**Bank Management & Financial Services**", Tata McGraw Hill New Delhi, 2010,
2. James S. Trieschmann, Robert E. Hoyt & David. W. Sommer B:"**Risk Management & Insurance**", Cengage Learning, New Delhi
3. Reddy K S and Rao R N: "Banking & Insurance", Paramount Publishing House 2013.
4. Vasant Desai: "Banks & Institutional Management", Himalaya Publishing House 2010.
5. Harold. D. Skipper & W. Jean Kwon: "Risk Management & Insurance, Perspectives in a Global Economy", Blackwell Publishing New Delhi.
6. NIA: "Life Insurance Principles and Practices", Cengage Learning, New Delhi,2013.
7. Neelam C.Gulati: "Banking and Insurance: Principles and Practice", Excel Books, New Delhi 2011.

V18MBT25: HUMAN RESOURCE PLANNING AND DEVELOPMENT

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

CO1: Understand the concept of HR Planning
CO2: Explain various factors influence demand and supply of manpower
CO3: Describe various models of learning
CO4: Assess training needs of employees
CO5: Evaluate various training methods

UNIT-I

Concept of HRP: Definition, need and importance of HRP-Process-Objectives of HRP- skill inventory-Macro Level manpower Planning and Labour market Analysis - Organisational Human Resource Planning; Work Force Flow mapping - Age and Grade Distribution mapping.

UNIT-II

Demand and supply forecasting: Human Resource demand and supply forecasting- Qualitative and Quantitative techniques of HR Demand forecasting; Redeployment and Exit Strategies. Succession planning- meaning and process-competency mapping.

UNIT-III

Instructional Technology for HRD: Learning and HRD; Models and Curriculum; Principles of Learning; Group and Individual Learning; Transactional Analysis; Assessment Centre; Behaviour Modelling and Self Directed Learning; Evaluating the HRD.

UNIT – 4

Human Resource Training and Development: Concept and Importance; Assessing Training Needs; Designing and Evaluating T&D Programmes; Role, Responsibilities and challenges to Training Managers.

UNIT – 5

Training Methods: Training with in Industry (TWI): On the Job & Off the Job Training; Management Development: Lecture Method; Role Play; In-basket Exercise; Simulation; Vestibule Training; Management Games; Case Study; Programmed Instruction; Team Development; Sensitivity Training; Globalization challenges and Strategies of Training Program, Review on T&D Programmes in India.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

Reference Books:

1. Nadler, Leonard :Corporat Human Resource Development, Van Nostrand Reinhold, ASTD, New York .
2. Rao, T.V and Pareek, Udai: Designing and Managing Human Resource Systems, Oxford IBH Pub. Pvt.Ltd., New Delhi , 2005.
3. Rao, T.V: Readings in HRD, Oxford IBH Pub. Pvt. Ltd., New Delhi , 2004

4. Viramani, B.R and Seth, Parmila: Evaluating Management Development, Vision Books, New Delhi .
5. Rao, T.V.(et.al): HRD in the New Economic Environment, Tata McGraw-Hill Pub.Pvt, Ltd., New Delhi , 2003.
6. Rao, T.V: HRD Audit, Sage Publications, New Delhi .
7. ILO, Teaching and Training Methods for Management Development Hand Book, McGraw-Hill , New York .
8. Rao, T.V: Human Resource Development, Sage Publications, New Delhi .
9. Kapur, Sashi: Human Resource Development and Training in Practice, Beacon Books, New Delhi
10. Strategic HRM by Mabey and Salama.

V18MBT26: COMPENSATION AND REWARD MANAGEMENT

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

CO1: Describe the meaning and concept of wage and salary administration

CO2: Explain various methods of calculating worth of a job

CO3: State the various theories of wage and salary

CO4: Analyze the role of a compensation in controlling the labour cost

CO5: Evaluate compensation structure and design efficient compensation package

UNIT 1

Compensation: concept and definition – objectives of compensation program – factors influencing compensation –Role of compensation and Reward in Modern organizations- Compensation as a Retention strategy- aligning compensation strategy with business strategy – concept of reward - non-financial compensation system-Reward management process - Managing Compensation: Designing a compensation system – internal and external equity– pay determinants

UNIT 2

Job evaluation and Compensation Structure: Introduction to Principles and Procedures of job evaluation programs-Introduction to basic job evaluation methods-Types of compensation system, compensation surveys- Incentive payments and its objectives.

UNIT 3

Wage and Salary administration: Nature and Purpose, Wage surveys-Administration of wage and salary-Principles-Components of wages-Theory of wages-Wage differentials-Importance- Wage differentials in India-Executive compensation plans-Legal frame work for wage and salary administration.

UNIT 4

Control systems for labour costs: Introduction-Direct and Indirect labour, Role of various departments-The personnel department-Industrial engineering department-Types of worker- Payroll department-Process and steps for preparation of payroll-Compensation surveys-Profit sharing.

UNIT 5

Pay Structure and Tax Planning: Introduction- Compensation Structures-Performance based and Pay based structures-Designing pay structures-comparison in evaluation of different types of pay structures-Significance of factors affecting-Tax Planning –Concept of Tax planning-Role of tax planning in compensation benefits-Tax efficient compensation package-Fixation of tax liability salary restructuring.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. Dr. Kanchan Bhatia “Compensation Management”, Himalaya Publishing House, New Delhi 2012.
2. A.M.Sarma, N.SambasivaRao: “Compensation and Performance management”, Himalaya Publishing House, Mumbai
3. DewakarGoel:“Performance Appraisal and Compensation Management”, PHI Learning, New Delhi, 2012
4. ER SoniShyan Singh ‘Compensation Management’ – Excel Books, New Delhi – 2008.
5. 5.Mousumi S Bhattacharya NilanjanSengupta , “Compensation Management” – Excel Books, New Delhi – 2009
6. 6.Tapomoy Deb “Compensation Management” – Excel Books, New Delhi – 2009

V18MBT27: PERFORMANCE MANAGEMENT

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

CO1: Describe the relationship between performance management and other disciplines
of HRM

CO2: Explain various approaches of performance management planning

CO3: Discuss various methods of design and implementation of performance management Systems.

CO4: Analyze the role of a compensation in controlling the labor cost

CO5: Evaluate compensation structure and design efficient compensation package

Unit-1

Introduction: Definition–concerns-scope-Historical developments in performance management-Over view of performance management-Process for managing performance- Importance –Linkage of PM to other HR processes-Performance Audit.

Unit-2

Performance Management Planning: Introduction-Need-Importance-Approaches-The Planning Process—Planning Individual Performance- Strategic Planning – Linkages to strategic planning-Barriers to performance planning-Competency Mapping-steps-Methods.

Unit-3

Management System: objectives – Functions- Phases of Performance Management System- Competency based Performance Management Systems- Reward based Performance Management Systems- HR Challenges- Appraisal for recognition and reward-Methods of Appraising- Appraisal system design-Implementing the Appraisal System

Unit-4

Performance Monitoring and Counselling: Supervision- Objectives and Principles of Monitoring- Monitoring Process- Periodic reviews- Problem solving-engendering trust- Role efficiency- Coaching- Counselling and Monitoring-Concepts and Skills

Unit-5

Performance management skills – Operational change through performance management. High Performing Teams: Building and leading High performing teams – team oriented organizations – developing and leading high performing teams- Role of Leadership

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. PremChadha: “Performance Management”, Macmillan India, New Delhi, 2008.
2. Michael Armstrong & Angela Baron, “Performance Management”: The New Realities, Jaico Publishing House, New Delhi, 2010.

3. T.V.Rao, “Appraising and Developing Managerial Performance”, Excel Books, 2003.
4. David Wade and RonadRecardo, “Corporate Performance Management”, Butter Heinemann, New Delhi, 2002.
5. DewakarGoel: “Performance Appraisal and Compensation Management”, PHI Leaarning, New Delhi, 2009
6. A.M. Sarma “Performance Management Systems” Himalaya Publishing House, New Delhi, 2010.

V18MBT28: STRATEGIC HUMAN RESOURCE MANAGEMENT

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

CO1: Understand the theoretical perspectives and various approaches to Strategic HRM

CO2: Describe various strategic HR Planning process

CO3: Explain strategic HR implementation process

CO4: Explain strategic HR Development

CO5: Evaluate various strategic HR strategies

UNIT-1

Human Resource Strategy: Introduction to Strategic Human Resource Management - Evaluation objectives and Importance of Human Resources Strategy- Strategic fit – A conceptual framework -Human Resources contribution to strategy - Theoretical Perspectives on SHRM approaches - Linking business strategies to HR strategies.

UNIT-2

Strategic Human Resource Planning: Objectives, benefits, levels of strategic planning- Activities related to strategic HR Planning-Basic overview of various strategicplanning models-Strategic HR Planning model-Components of the strategic plan.

UNIT-3

Strategy Implementation: Strategy implementation as a social issue-The role of Human Resource-Work force utilization and employment practices-Resourcing and Retention strategies-Reward and Performance management strategies.

UNIT-4

Strategic Human Resource Development: Concept of Strategic Planning for HRD- Levels in Strategic HRD planning-Training and Development Strategies-HRD effectiveness- employee engagement- Green HRM

UNIT-5

Human Resource Evaluation: Approaches to evaluation, Evaluation Strategic contributions of Traditional Areas - Evaluating Strategic Contribution of Emerging Areas-HR as a Profit centre and HR outsourcing strategy.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Charles R. Greer: “Strategic Human Resource Management” - A General Manager Approach - Pearson Education, Asia
2. Fombrum Charles &Tichy: “Strategic Human Resource Management” - John Wiley Sons, 1984
3. Dr. Anjali Ghanekar “Strategic Human Resource Management” Everest Publishing House, Pune 2009
4. TanujaAgarwala “Strategic Human Resource Management” Oxford University Press, New Delhi 2014
5. Srinivas R Kandula “Strategic Human Resource Development” PHI Learning PVT Limited, New Delhi 2009

6. Dreher, Dougherty “Human Resource Strategy” Tata McGraw Hill Publishing Company Limited, New Delhi 2008

V18MBT29: LOGISTICS & SUPPLY CHAIN MANAGEMENT

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

CO1: Understand the importance of logistics management.

CO2: Get familiarity with various cost concepts in measuring logistics performance.

CO3: Understand the relationship between logistics and supply chain management.

CO4: Identify the need for coordination in LSCM.

CO5: Understand global logistics management.

UNIT-I:

Logistics and Competitive strategy: Competitive advantage – Gaining Competitive advantage through logistics-Integrated supply chains– Competitive performance - Models in Logistics Management - Logistics to Supply Chain Management – Focus areas in Supply Chain Management.- Customer service and retention- Basic service capability Value added services

UNIT 2:

Measuring logistics costs and performance: The concept of Total Cost analysis – Principles of logistics costing – Logistics and the bottom-line – Impact of Logistics on shareholder value - customer profitability analysis –direct product profitability – cost drivers and activity-based costing.

UNIT 3:

Logistics and Supply chain relationships: Benchmarking the logistics process and SCM operations –Mapping the supply chain processes – Supplier and distributor benchmarking – setting benchmarking priorities –identifying logistics performance indicators –Channel structure

– Economics of distribution –channel relationships –logistics service alliances.

UNIT 4:

Sourcing, Transporting and Pricing Products: sourcing decisions and transportation in supply chain – infrastructure suppliers of transport services – transportation economics and pricing – documentation - pricing and revenue management Lack of coordination and Bullwhip Effect - Impact of lack of coordination. - CRM –Internal supply chain management - .

UNIT 5:

Managing global Logistic: Logistics in a global economy – views of global logistics- global operating levels – interlinked global economy – Global strategy – Global purchasing – Global logistics – Channels in Global logistics –Global alliances.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. Donald J.Bowersox and David J.Closs: “Logistical Management” The Integrated Supply Chain Process, TMH, 2011.
2. Edward J Bradi, John J Coyle: “ A Logistics Approch to Supply Chain Management, Cengage Learning, New Delhi, 2012.
3. D.K.Agrawal: “Distribution and Logistics Management”, MacMillan Publishers, 2011
4. Sunil Chopra and Peter Meindl: “Supply chain Management: Strategy, Planning and Operation”, Pearson Education, New Delhi 2013
5. Rahul V Altekar: Supply Chain Management, PHI Learning Ltd, New Delhi, 2009

V18MBT30: BUSINESS ANALYTICS

L	T	P	C
3	0	4	4

COURSE OUTCOMES:

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

1. Demonstrate the need of Business Analytics in today's business world.
2. Illustrate the phases of business analytics life cycle.
3. Demonstrate various Big Data technologies for business analytics.
4. Illustrating the use of R programming for business analytics.
5. Creating data sets using R programming and analyzing business data for decision making..

Unit– I: Introduction to Business Analytics –Competing on Analytics – The New Science of Winning Business Analytics – The Paradigm Shift from Data to Insight and from Business Intelligence to Business Analytics – Descriptive - Predictive and Prescriptive.

Unit–II: The Business Analytics Cycle Information summary about Books – Tools –Blogs- Resources –Groups – communities –Videos –Useful links- Sources of Data –Database Architecture and Data Gathering Process-Types of Data- Overview of an online survey/research project**.**

Unit-III: Introduction to Big Data – Structuring of Big Data –Elements of Big Data- Business Applications of Big Data –Handling Big Data Technologies –Data Mining and Text Mining.

Unit–IV: Creating R data sets – Reading raw data files (Column input/formatted input)- Assigning variable attributes – Changing variable attributes – Reading MS spread sheets in R**.** **(Including Practical)**

Unit–V: Reading R data sets and creating variables –Reading Delimited Raw Data Files –Using Excel for Data Management –Purpose of the Database- Relational Databases Entities – Relationships and Attributes –Specify Keys – Primary and Foreign –Create Relationships among Tables –Refinement and Normalization – Microsoft Access and R. **(Including Practical)**

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Big Data for Dummies – Authors: Judith Hurwitz, Alan Nugent, Fern Halper, and Marcia Kaufman
2. BIG DATA using SMART Big Data Analytics to make better decisions and improve performance – Author: BERNARD MARR
3. Analytics in a Big Data World, the essential guide to data science and its applications – Author: BART BAESENS
4. Data Science for Business, what you need to know about Data Mining and Data-Analytic Thinking – Author: FOSTER PROVOST & TOM FAWCETT

5. Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data – Author: EMC Education Services
6. R For Dummies – Authors: Andrie de Vries, and JorisMeys

V18MBT31: SERVICES MARKETING

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

1. Understand the nature and importance of services in an economy.
2. Understand the need for CRM in services.
3. To get familiarity on service product and strategy.
4. To understand distribution mechanism for services
5. To analyze the importance of service quality.

Unit I: Importance of services marketing; Service characteristics and Marketing challenges; Reasons for growth of services sector; Services sector in the Indian economy.

Unit II: Customer Relationship Marketing: Relationship Marketing, the nature of services consumption, understanding customer needs and expectations, strategic response to the intangibility of service performance.

Unit III: Services product management (Basic service package, CVH, service flower, new service development, service life cycle); Services branding and positioning; physical evidence; Pricing of services.

Unit IV: Service Distribution strategies; internal marketing; External marketing; Interactive marketing (Service encounter, Management of moments of truth, Interaction process design and efficiency).

Unit V: Service quality management (Gap model, SERVQUAL); Total quality services marketing; Services failures and recovery strategies (Case Studies are Compulsory)

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

Suggested Books:

1. K.Rama Mohana Rao: Services Marketing, Pearson, 2 Ed. New Delhi.
2. Valeri Zeithmal, Mary Jo Binter,Dwayne D Gremler and Ajay Pandit: Services Marketing, Tata McGraw Hill, New Delhi.
3. Christopher Lovelock, Jochen Wirtz and Jayanta Chatterjee: Services Marketing: People, Technology, Strategy, Pearson, New Delhi.
4. Christian Gronroos: Services Management and Marketing, Maxwell Macmillan.
5. Harsh V. Verma, Services Marketing, Pearson, New Delhi.

V18MBT32: SALES AND DISTRIBUTION MANAGEMENT

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

1. Understand the basic concept of Sales and distribution management.
2. Apply personal selling techniques to promote a product.
3. Apply various concepts of sales force management.
4. Understand various issues related to distribution channels.
5. Understand the functionality of logistics and supply chain concepts.

UNIT1:

Definition of Sales Management-nature and scope of sales Management –Modern trends in Sales Management -Role and responsibilities of Sales Managers - Organization of Sales Department-Different types of Sales Organizations

UNIT2:

Personal Selling –Objectives – Approaches to Personal Selling –Process of Personal Selling- Organization Design and Staffing, Sales Planning, Time and Territory Management

UNIT3:

Managing sales Force - Recruitment –Selection and Training of salesmen-Salesmen's Compensation Plans - Evaluation of Salesmen's performance –Sales Control Research

UNIT4:

Marketing Channels- Structure and Functions-Channel Design –Selecting Channel Members –Motivating Channel Members –Selection and Recruitment of Channel Partners- Channel Conflicts –Reasons –Managing Channel Conflicts

UNIT5:

Distribution Management -–Retailing –Wholesaling - Supply Chain Management-Managing Logistics-Physical Distribution Management –Transportation and Traffic Management –Warehousing and Storage

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Sales Management: Decisions, Strategies & Cases, Richard R. Still, Edward W. Cundiff, Norman A.P. Govoni, Pearson Education, Latest Edition
2. Sales Management: Concepts Practice, and Cases, Johnson F.M., Kurtz D.L., Scheuing E.E., Tata McGraw- Hill, Latest Edition

3. Selling & Sales Management, David Jobber, Geoffrey Lancaster, Pearson Education, Latest Edition
4. Sales Management, Tanner, Honeycutt, Erffmeyer, Pearson Education, Latest Edition
5. Sales Force Management, Mark W. Johnston, Greg W. Marshall, Tata McGraw-Hill, Latest Edition
6. Sales Management, William L. Cron, Thomas E. DeCarlo, Wiley, Latest Edition
7. Sales & Distribution Management, Dr. S. L. Gupta, Excel, Latest Edition

V18MBT33: DIGITAL AND SOCIAL MEDIA MARKETING

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

CO1 : Recall the basic and advanced concepts of Marketing learned.

CO2 : Understand and gain Knowledge in Fundamental aspects of Digital Marketing.

CO3 : Apply SEM in managing promotional activities.

CO4 : Apply SMM techniques in planning a promotional campaign.

CO5 : Manage the promotional activities using SMO.

UNIT 1

Overview of Traditional Marketing: Marketing process, Marketing Mix, Promotion Strategies, Importance of Distribution Networks, Green Marketing, Guerrilla Marketing, Double Loop Marketing-From Mind share to wallet share.

UNIT 2

Fundamentals of Digital Marketing : Difference between Marketing and Sales, Inbound Vs Outbound Marketing, 7P's of Marketing, Concept of Digital Marketing, evolution of Digital marketing, various tools available in Digital Marketing landscape, advantages to marketers going digital, Understanding the concepts of Traffic and Leads.

UNIT 3

Search Engine Marketing: Understanding Ad words, Ad words Account structure, Ad types, Keyword Match types, Ad rank, Quality score calculation, Keyword planning and control, Bidding Strategies, Creating Ad campaigns (Search and Display only)

UNIT 4

Social Media Marketing: Importance of Social Media, Social Media-Disruption of Traditional Media, Benefits of Social Media Marketing, Social media jargon-Structure of SMM, Developing SMM strategy, Benefits of Blogs and Webinars - Planning a SMM Campaign and latest trends in social media marketing.

UNIT 5

Social Media Optimization: Meaning of Social Media optimization, Techniques of SMO, Edge rank algorithm, Practical Sessions on Social blogging sites. Add on Topics in Digital Marketing - Basic concepts of Search Engine optimization, Affiliate Marketing, E-Mail Marketing, Drip Marketing and Google Analytics. Cyber crime and ethical aspects of social media marketing.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Puneet Singh Bhatia (2017). 'Fundamentals of Digital Marketing'.Pearson Education.
2. Seema Gupta (2017). 'Digital Marketing.'Tata McGraw Hill.
3. Philip Kotler (2017). 'Marketing 4.0 : Moving from Traditional to Digital'.
4. VandanaAhuja (2015). 'Digital Marketing'.Oxford University Press.
5. AnkitSrivastava (2018) 'Social Media Marketing and Branding'.Pbp publishers.

V18MBT34: INTERNATIONAL MARKETING MANAGEMENT

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

CO1: Illustrate the marketing principles that together constitute the field of study known as international marketing;

CO2: Evaluate and design sustainable strategies for International markets.

CO3: Understand and assess the challenges of managing product and price decisions in International markets.

CO4: Evaluate various marketing channels in International arena.

CO5: Practice export related documentation by following authenticated procedures.

UNIT 1:

Introduction to International Marketing: Scope and Significance of international Marketing, - Difference between International and domestic marketing – The growing attractiveness of developing country market – International orientations, Stages of internationalization, Driving and restraining forces of International markets, Participants in international marketing.

UNIT 2:

International marketing strategy: Entry strategies in International markets – modes of entries in International markets – International market segmentation – international targeting – criteria for targeting, selecting a International target market – International product positioning strategy. Business Customs in International Market – strategies for FDI and FIIs - Entry Strategies of Indian Firms

UNIT 3:

International Product & Price management: International product mix – Managing International Research and Development for product management– Product diffusion and adoption in International markets – Product and culture – International brand leadership – : Environmental influences on Pricing Decisions – Grey Market goods – Transfer pricing – International Pricing – Policy Alternatives – Constraints on International pricing

UNIT 4:

International Marketing Channels and Promotion for International markets: channels – Innovations in International channels – Channel strategy for new market entry – Distribution Structures – International Distribution Patterns - Challenges in Managing An International Distribution Strategy – Selecting Foreign Country Market intermediaries - International Advertising and branding - Export Policy Decisions of a firm - Export costing and pricing – EXIM policy of India.

UNIT 5:

Export procedures and documents: Preliminaries: inquiry and offer – confirmation of offer – export license – finance – production /procurement of goods – shipping space – packing and marketing – quality control and pre – shipment inspection – excise clearance – customs formalities – negotiation and documents – standardization and aligned pre-shipment documents – documents related to goods – documents related to shipments.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. Francis Cherunilam: International marketing, 11th Edition, Himalaya Publication
2. House,2010
3. Warren J Keegan: Global Marketing Management, 5th Edition, Prentice Hall of India
4. Private Limited.
5. Philip R. Cateora, John L. Graham: International Marketing 11/e, Tata McGraw-Hill Co. Ltd.,
6. 2002.
7. R.Srinivasan: International Marketing, Prentice-Hall of India Pvt. Ltd., 2010
8. U.C Mathur: International Marketing Management, Sage Publications, New Delhi 2008
9. Kotabe, Peloso: International Marketing, Wiley India, New Delhi, 2020

V18MBT35: FINANCIAL DERIVATIVES

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

1. Understand the nature of derivatives and derivative markets
2. Know the trading of futures on BSE &NSE
3. To get fundamental knowledge of options market
4. Apply pricing mechanism on various derivative options.
5. To get the ability of understanding swaps and economic functions of swap transactions.

Unit– I: Introduction to Financial Derivatives – Meaning and Need – Growth of Financial Derivatives in India – Derivative Markets – Participants – Functions – Types of Derivatives – Forwards – Futures – Options – Swaps – The Regulatory Framework of Derivatives Trading in India.

Unit – II: Features of Futures – Differences Between Forwards and Futures – Financial Futures – Trading – Currency Future – Interest Rate Futures – Pricing of Future Contracts – Value At Risk (VAR) – Hedging Strategies – Hedging with Stock Index Futures –Futures Trading on BSE & NSE.

Unit – III: Options Market – Meaning & Need – Options Vs futures – Types of Options Contracts – Call Options – Put Options – Trading Strategies Involving Options – Basic Option Positions – Margins – Options on stock Indices – Option Markets in India on NSE and BSE.

Unit – IV: Option Pricing – Intrinsic Value and Time Value - Pricing at Expiration – Factors Affecting Options pricing – Put-Call Parity Pricing Relationship – Pricing Models – Introduction to Binominal Option Pricing Model.

Unit – V: Swaps – Meaning – Overview – The Structure of Swaps – Interest Rate Swaps – Currency Swaps – Commodity Swaps – Swap Variant – Swap Dealer Role – Equity Swaps – Economic Functions of Swap Transactions – FRAs and Swaps.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

Suggested Books:

1. Rene M Stulz, Risk Management and Derivatives, Cengage, New Delhi
2. David Thomas. W & Dubofsky Miller. Jr., Derivatives Valuation and Risk Management, Oxford University, Indian Edition.

3. N.D.Vohra & B.R.Baghi, Futures and Options, Tata McGraw-Hill Publishing Company Ltd.
4. Red Head: Financial Derivatives: An Introduction to Futures, Forward, Options" Prentice Hall of India.
5. David A. Dubofsky, Thomas W.Miller, Jr.: Derivatives: Valuation and Risk Management, Oxford University Press.
6. Sunil K.Parameswaran, "Futures Markets: Theory and Practice" Tata-McGraw-Hill Publishing Company Ltd.
7. D.C.Parwari, Financial Futures and Options, Jaico Publishing House
8. T.V.Somanathan, Derivatives, Tata McGraw-Hill Publishing Company Ltd.
9. NSE manual of Indian Futures & Options & www.Sebi.com

V18MBT36: PROJECT APPRAISAL AND FINANCE

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

1. Understand the nature, importance, various types of projects and project life cycle.
2. Know the different kinds of feasibility studies like market, technical, managerial etc.
3. Evaluating project appraisals by applying capital budgeting techniques.
4. Estimation of project scheduling using PERT and CPM
5. Identify the project related risks and remedial measures.

Unit I: Basics of Project Management –Concept–need-objectives-Characteristics of project - Project environment – Types of Projects – Project life cycle-phases – Project selection – Causes of delay in Project commissioning– Remedies to avoid overruns.

Unit II–Feasibility study: Project analysis-Feasibility studies and reports – Stages of Project feasibility study – Components for project feasibility studies. Market feasibility -Market survey – Technical feasibility-Managerial Feasibility-Legal Aspects of Project Management.

Unit III: Financial Appraisal – Criteria and Investment strategies – Capital Investment - Risk analysis – Cost and financial feasibility – Cost of project and means of financing –Estimation of cash flows – Appraisal Techniques (Non DCF and DCF)-Cost-Benefit Ratio-Financial evaluation under Uncertainty – Tax benefits.(Problems)

Unit IV: Project Scheduling: Network analysis- Development of Programme Evaluation & Review Technique (PERT) – Benefits of PERT – Assumptions in PERT modelling Construction of PERT (Project duration and valuation, slack and critical activities, critical path interpretation) – Critical Path –Method (CPM) (Problems)

Unit V:–Project Risk Management*:* Introduction to Risk, Risk Management, Role of Risk Management in Overall Project Management, Process of Risk Management in project management, Reducing Risks. Abandonment analysis - Social Cost Benefit Analysis (SCBA) National and International importance of projects.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

Suggested Books:

1. Gido: Effective Project Management, 2e, Thomson, 2007.

2. Prasanna Chandra, “Projects, Planning, Analysis, Selection, Financing, Implementation and Review”, TataMcGraw Hill Company Pvt. Ltd., New Delhi 1998.
3. Damodaran, “Corporate Finance”, Johy Wiley Publications.
4. Erhardt & Brigham, “Principles of Corporate Finance”, Thomson, 2006.
5. Singh M.K, “Project Evaluation and Management”
6. Prasad N.K, “Principles and Practice of Cost Accounting”, 8. Pahwa, HPS, Project Financing.
7. Clifford F. Gray, Erik W. Larson, “Project Management, the Managerial Emphasis”, McGraw Hill, 2000.

V18MBT37: BUSINESS TAXATION & PLANNING

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

1) To Know about various types of Direct taxes
2) Understand the computation of various types of indirect taxes
3) To get familiarity with tax planning.
4) To understand basis of tax management decisions
5) Able to understand International tax system.

UNIT 1

Direct Taxes: Income Tax Act 1961 – Basic concepts – Income – Agricultural Income – Residential Status – Income exemption from tax – Income from House Property – Computation of Salary Income – Income from Business and Profession – Capital Gain from other sources – computation of Total Income.

UNIT 2

In Direct Taxes: Historical Evolution of GST and VAT in India. – Issues of GST – Components of GST. Excise Duty – Introduction – Nature – Basic Concepts. Customs Duty – Introduction – Basic Concepts – Scope and Converge of Customs Duty – Nature of Customs Duty – Classification for Customs – Types of Custom Duties – Exemptions from Customs Duty.

UNIT 3

Introduction to Tax Planning: Nature of Tax – Essential components in levy of tax – Legal Principles of taxation laws – Five basic Rules of interpretation of statues – Law Lexicon and Legal Maxims – Concepts of Tax Avoidance, Tax Evasion – Tax Planning and Tax Management.

UNIT 4

Tax Management Decisions: Tax considerations - Management Decisions, such as make / buy- own/lease - export/local sale - Guidelines to Tax planning – Relief's – Concessions – Rebates – Deductions – Incentives (Payment of Advance Tax) – Filing of Returns – Refunds – Penalties for non-compliance.

UNIT 5

Multi National Taxation: Bilateral Tax Treaties- Transfer Pricing for Tax Planning – Uses of Inter Company Loans- Tax Intensives Organizational Setup of MNCs- Tax Reliefs and Rebates in India- Tax Credits- Tax Havens- Investment Decision on Tax Planning- Global Investment and Tax Incentives- Transfer Pricing Methods- Measures to Plug Tax Loopholes.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Vinod K.Singhania and Mounica singhnia, Corporate Tax Planning and business Management, Taxmann Publications.
2. Vinod K.Singhania and Kapil Singhania, Direct Taxes – Law and Practice, Taxmann Publications
3. R.N.Lakhotia, Corporate Tax Planning, vision publications.
4. V.A. Avadhani, "International Financial Managment" Himalaya Publishing House, 2009
5. PG Apte, "International Financial Management" Tata Mc Graw Hill, 2009.
6. Arun kumar "Ground Scorching Tax" Penguin Portfolio

V18MBT38: INTERNATIONAL FINANCIAL MANAGEMENT

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

- Understand the Evolution of international monetary system,
- Get the knowledge to apply the various measures to face the foreign Exchange risk
- Awareness about the international financial markets and financial instruments used in financial market
- Gained knowledge about the Corporate Strategies that MNC's will apply for FDI and Valuation of international acquisitions.
- Able to read and analyse the financial reports of MNC's

Unit I: International Monetary and Financial System: Introduction to international financial Management, Nature and Scope, International Monetary System: Breton Woods Conference and Other Exchange Rate Regimes; European Monetary System, South East Asia Crisis and Current Trends.

Unit II: Foreign Exchange Markets: Foreign Exchange market Structures, Quotations and speculation, Arbitrage in Forex Market , Forex Exposure , Transaction Exposure; Accounting Exposure and Operating Exposure – Management of Exposures – Internal Techniques, Management of Risk in Foreign Exchange Markets: FOREX Derivatives – Swaps, futures and Options and Forward Contracts (Cases).

Unit-III: Features of Different International Markets: Euro Loans, CPs, Floating Rate Instruments, Loan Syndication, Euro Deposits, International Bonds, Euro Bonds and Process of Issue of GDRs and ADRs.

Unit-IV: Foreign Investment Decisions: Corporate Strategy and Foreign Direct Investment; Multinational Capital Budgeting; International Acquisition and Valuation, Adjusting for Risk in Foreign Investment.

Unit V: International Accounting and Practices; Accounting Practices of MNCs, Accounting For Foreign Currency Translation, Consolidation of Financial Statement. Accounting For Inflationary Trends. Transfer Pricing, Arm's-length price, Benefits and Costs of Transfer Pricing. Transfer pricing and Indian tax Provisions.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

1. Buckley Adrin, Multinational Finance, 3rd Edition, Engle Wood Cliffs, Prentice Hall of India.
2. S.P.Srinivasan, B.Janakiram, International Financial Management, Wiley India, New Delhi.
3. Clark, International Financial Management, Cengage, ND

4. V.Sharan, International Financial Management, 3rd Edition, Prentice Hall of India.
5. A.K.Seth, International Financial Management, Galgothia Publishing Company.
6. P.G.Apte, International Financial Management, Tata McGrw Hill, 3rd Edition
7. .Bhalla, V.K., International Financial Management, 2nd Edition, New Delhi, Anmol, 2001. V.A.Avadhani, International Financial Management, Himalaya Publishing House.
8. Bhalla, V.K., Managing International Investment and Finance, New Delhi, Anmol, 1997.

V18MBT39: ORGANIZATIONAL CHANGE & DEVELOPMENT

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

CO1: Recall the nature and importance of change in organizations
CO2: Represent various changes through mapping and diagramming
CO3: Describe nature, importance and interventions of OD
CO4: State the changes in labour management in India
CO5: analyse the need for teams and harness team work in organizations

UNIT 1

Basics of Change Management: Meaning, nature and Types of Change – change programmes – change levers – change as transformation – change as turnaround – value based change.

UNIT 2

Mapping change: The role of diagramming in system investigation – A review of basic flow diagramming techniques –systems relationships – systems diagramming and mapping, influence charts, multiple cause diagrams- a multidisciplinary approach - Learning organization: The relevance of a learning organization - strategies to build a learning organization.

UNIT 3

Organization Development (OD): Meaning, Nature and scope of OD - Dynamics of planned change – Person-focused and role-focused OD interventions –Planning OD Strategy – OD interventions in Indian Organizations – Challenges to OD Practitioners.

UNIT 4

Negotiated Change: Change in the labour - management relations in the post-liberalized India – collective bargaining strategy to the challenges of Globalization and the restructuring of enterprises in India - Changes in the legal frame work of collective bargaining -social security.

UNIT 5

Team Building: Nature and Importance of Teams – Team Vs Groups – Types of teams – Characteristics of Virtual teams – Team building life cycle – Team building skills – Virtual team - High performance teams – self managing teams – Building team relationships – empowered teams – leadership on teams – Managing cross –cultural diversity in teams – Group think as a decision making process – effective decision making techniques for teams and groups.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. Cummings: “Theory of Organisation Development and Change”, Cengage Learning, New Delhi, 2013.
2. Robert A Paton: Change Management, Sage Publications, New Delhi, 2011.
3. NilanjanSengupta: Managing Changing Organisations, PHI Learning, New Delhi, 2009
4. Adrian Thornhill: Managing Change, Pearson Education, New Delhi, 2012.
5. Radha R Sharma: Change Management, TMH, New Delhi, 2012

V18MBT40: MANAGEMENT OF INDUSTRIAL RELATIONS

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

CO1: Explain the factors influence IR

CO2: Describe the growth and functioning of trade unions

CO3: Describe nature, importance and various forms of Workers' Participation in management.

CO4: Recall the Salient features of Workmen Compensation Act.

CO5: Analyse the Causes of Grievances and Design redressal mechanism.

UNIT 1

Industrial Relations Management: Concept- meaning- evaluation –Background of industrial Relations in India- Influencing factors of IR in enterprise and the consequences. Economic, Social and Political environments-Employment Structure –Social Partnership-Wider approaches to industrial relations- Labour Market.

UNIT 2

Trade Unions: Introduction-Definition and objectives-growth of Trade Unions in India-trade Unions Act , 1926, recent amendments. Legal framework-Union recognition-Union Problems-Employees Association-introduction ,Objective Membership, Financial Status.

UNIT 3

Workers' Participation in Management: Workers' Participation in Management - Worker's Participation in India, shop floor, Plant Level, Board Level- Workers' Welfare in Indian scenario- Collective bargaining concepts & Characteristics – Promoting peace.

UNIT 4

Social Security: Introduction and types –Social Security in India, Health and Occupational safety programs- Salient features of Workmen Compensation Act and Employees' State Insurance Act relating to social security – Workers' education objectives -Rewarding.

UNIT 5

Employee Grievances: Causes of Grievances –Conciliation, Arbitration and Adjudication procedural aspects for Settlement of Grievances –Standing Orders-Code Discipline. Industrial Disputes: Meaning, nature and scope of industrial disputes - Cases and Consequences of Industrial Disputes –Prevention and Settlement of industrial disputes in India.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References

1. C.S Venkataratnam: “Industrial Relations”, Oxford University Press, New Delhi, 2011
2. Sinha: “Industrial Relations, Trade Unions and Labour Legislation”, Pearson
3. Education, New Delhi, 2013
4. Mamoria: “**Dynamics of Industrial Relations**”, Himalaya Publishing House, New Delhi,
5. 2010
6. B.D.Singh: “**Industrial Relations**” Excel Books, New Delhi, 2010
7. Arun Monappa: “**Industrial Relations**”, TMH, New Delhi. 2012
8. Prof. N.Sambasiva Rao and Dr. Nirmal Kumar: “**Human Resource Management and**
9. **Industrial Relations**”, Himalaya Publishing House, Mumbai
10. Ratna Sen: “**Industrial Relations**”, MacMillon Publishers, New Delhi, 2011

V18MBT41: LABOUR WELFARE & LEGISLATION

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

CO1: Describe various problems in labour welfare

CO2: Reproduce various labour welfare programs

CO3: Recall the provisions of various acts related to labour welfare

CO4: Recall the provisions of various acts related to payment of bonus and wages

CO5: Explain the functioning of trade unions in India

UNIT 1

Labour Welfare: Concept, scope and philosophy, principles of labour welfare, Indian constitution on labour, Agencies of labour welfare and their role. Impact of ILO on labour welfare in India-Labour problems – Indebtedness, Absenteeism, Alcoholism, Personal and Family Counselling.

UNIT 2

Labour welfare programmes: Statutory and non-statutory, extra mural and intra mural, Central Board of Workers' Education; Workers' Cooperatives; Welfare Centers, Welfare Officers' Role, Status and Functions. Role of social work in industry, Labour welfare fund.

UNIT 3

Welfare Legislation: Factories Act 1948, Mines Act 1952, Plantation Labour Act 1951, Contract Labour (Regulation and Abolition) Act 1970 and A.P. Shops and Establishments Act.

UNIT 4

Wage and Social Security Legislation: Payment of wages Act 1936 - Minimum wages Act 1948 - Payment of Bonus Act 1966 -. Payment of Gratuity Act 1972 - Workmen's Compensation Act 1923 - Employees State Insurance Act 1948 - Maternity Benefit Act 1961 and Employees Provident Fund and Miscellaneous Provisions Act 1952.

UNIT 5

Industrial Relations Legislation: Industrial Disputes Act 1947; Industrial Employment (standing orders) Act 1946 and Trade Unions Act 1926.

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Govt. of India (Ministry of Labour, 1969). Report of the Commission on Labour Welfare, New Delhi: Author.
2. Govt. of India (Ministry of Labour, 1983). Report on Royal Commission on Labour in India, New Delhi: Author.
3. Malik, P.L: "Industrial Law", Eastern Book Company. Laknow,1977
4. Moorthy, M.V: "Principles of Labour Welfare", Oxford University Press, New Delhi.

5. Pant, S.C: “Indian Labour Problems”, Chaitanya Pub. House. Allahabad.

V18MBT42: INTERNATIONAL HRM

L	T	P	C
4	0	0	4

COURSE OUTCOMES:

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

CO1: Describe global HR perspective

CO2: Explain problems involved in international assignments

CO3: Discuss the relevance of Cross Culture Communication in global context

CO4: Evaluate the worth of a overseas assignment

CO5: Evaluate Global Strategic Advantages through HRD

UNIT 1

Introduction: A Global HR Perspective in New Economy-Challenges of Globalization -Implications of Managing People and Leveraging Human Resource- - Conflicts - Strategic Role of International HRM – Global HR Planning – Staffing policy – Training and development – performance appraisal –International Labour relations – Industrial democracy.

UNIT 2

Managing International Assignments: Significance – Selection methods - Positioning Expatriate – Repatriate – factors of consideration - Strategies - International assignments for Women – gender issues.

UNIT 3

Cross Culture Management: Importance – Concepts and issues – theories-considerations - Problems – Skill building methods – Cross Culture Communication and Negotiation – Cross Culture Teams.

UNIT 4

Compensation Management: Importance – Concepts- Trends - Issues – Methods – Factors of Consideration – Models – incentive methods – global compensation implications on Indian systems - Performance Management.

UNIT 5

Global Strategic Advantages through HRD: Measures for creating global HRD Climate – Strategic Frame Work of HRD and Challenges - Globalization and Quality of Working Life and Productivity – Challenges in Creation of New Jobs through Globalization- New Corporate Culture

Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit.

References:

1. Subba Rao P: “International Human Resource Management”, Himalaya Publishing House, Hyderabad, 2011
2. NilanjanSen Gupta: “International Human Resource Management Text and cases” Excel Books, New Delhi.
3. Tony Edwards :“International Human Resource Management”, Pearson Education, New Delhi, 2012

4. Aswathappa K, Sadhana Dash: “International Human Resource Management, TMH, New Delhi,
5. Monir H Tayeb: “International Human Resource Management”, Oxford Universities Press, Hyderabad, 2012.

Appendix-MBA-02

Course: MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
Code : V18MBT51

COURSE OUTCOMES:

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

CO1: Understand the basic concepts of managerial economics, demand, and elasticity of demand and methods of demand forecasting.
CO2: Interpret the production function with one, two and infinite variables. Understanding various cost concepts and calculating breakeven point
CO3: Identify price output determination in different types of market structures and knowing various pricing methods
CO4: Understand various forms of business organizations
CO5: Prepare financial statements and its analysis.
CO6: Appraise the projects by using various capital budgeting methods

UNIT-I

Introduction to Managerial Economics and demand Analysis: Definition of Managerial Economics –Scope of Managerial Economics and its relationship with other subjects – Concept of Demand, Types of Demand, Determinants of Demand- Demand schedule, Demand curve, Law of Demand and its limitations- Elasticity of Demand, Types of Elasticity of Demand and Measurement- Demand forecasting and Methods of forecasting..

UNIT – II

Production and Cost Analyses: Concept of Production function- Cobb-Douglas Production function- Law of Variable proportions-Isoquants and Isocosts and choice of least cost factor combination-Concepts of Returns to scale and Economies of scale-Different cost concepts: opportunity costs, explicit and implicit costs- Fixed costs, Variable Costs and Total cost –Cost–Volume-Profit analysis-Determination of Breakeven point(simple problems)Managerial significance and limitations of Breakeven point.

UNIT – III

Introduction to Markets, & Pricing Policies: Market Structures: Perfect Competition, Monopoly, Monopolistic competition and Oligopoly – Features – Price and Output Determination – Methods of Pricing: Average cost pricing, Limit Pricing, Market Skimming Pricing, Internet Pricing, Flat Rate Pricing, Usage sensitive pricing and Priority Pricing.

UNIT – IV

Types of Business Organization and Business Cycles: Features and Evaluation of Sole Trader, Partnership, Joint Stock Company – State/Public Enterprises and their forms – Business Cycles : Meaning and Features – Phases of Business Cycle.

UNIT – V

Introduction to Accounting & Financing Analysis: Introduction to Double Entry Systems – Preparation of Financial Statements-Analysis and Interpretation of Financial Statements-Ratio Analysis

UNIT – VI

Capital and Capital Budgeting: Capital Budgeting: Meaning of Capital-Capitalization-Meaning of Capital Budgeting-Time value of money- Methods of

appraising Project profitability: Traditional Methods and modern methods (simple problems)

TEXT BOOKS

1. Dr. N. AppaRao, Dr. P. Vijay Kumar: 'Managerial Economics and Financial Analysis',Cengage Publications, New Delhi – 2011
2. Dr. A. R. Aryasri – Managerial Economics and Financial Analysis, TMH 2011
3. Prof. J.V.Prabhakararao, Prof. P. Venkatarao. 'Managerial Economics and Financial Analysis', Ravindra Publication.

REFERENCES:

1. Shailaja Gajjala and Usha Munipalle, Univerties press, 201 Dr. B. Kuberudu and Dr. T. V. Ramana: Managerial Economics & Financial Analysis, Himalaya Publishing House, 2014.
2. V. Maheswari: Managerial Economics, Sultan Chand.2014
3. Suma Damodaran: Managerial Economics, Oxford 2011.
4. VanithaAgarwal: Managerial Economics, Pearson Publications 2011.
5. Sanjay Dhameja: Financial Accounting for Managers, Pearson
6. Maheswari: Financial Accounting, Vikas Publications.
7. S. A. Siddiqui&A. S. Siddiqui: Managerial Economics and Financial Analysis, New Age International Publishers, 2012
8. Ramesh Singh, Indian Economy, 7th Edn., TMH2015
9. Pankaj Tandon A Text Book of Microeconomic Theory, Sage Publishers, 2015

Annexure-V

Minutes of the meeting, BOS of English (Held on 19.04.2019)

Minutes of the Second Meeting of Board of Studies of English held on 19/04/2019 at Srinivasa Ramanujan Hall of Learning (E-block) in the Department of BS&H.

Agenda Item No: 1

To discuss and review the continuation of the syllabi of English-I, English-II, ECS Lab-I & ECS Lab-II for I & II Semesters of B.Tech for the Academic Year 2019-2020.

Resolution: No changes were recommended.

Agenda Item No: 2

To discuss and finalize the syllabi of Professional Communication Skills-I & Professional Communication Skills-II for III & IV Semesters of B.Tech for the Academic Year 2019-2020.

Resolution: The Mandatory Non-credit Courses (MNCs), viz., Employability Skills-I (V18ENT03) & Employability Skills-II (V18ENT04) have been replaced by **Professional Communication Skills-I (V18ENT03)** and **Professional Communication Skills–II (V18ENT04)** respectively and the syllabi have been approved and is given in Appendix-BSH-English-01.

Agenda Item No: 3

To discuss and finalize the syllabus of 'Constitution of India' for the III Semester of B.Tech in the department of ECE & the IV Semester of the departments of CSE & ME for the Academic Year 2019-2020.

Resolution: The syllabus of the Mandatory Non-credit Course (MNC) **Constitution of India (V18ENT11)** has been discussed and approved and is given in Appendix-BSH-English-02.

Agenda Item No: 4

To discuss and finalize the syllabus of 'Professional Ethics and Human Values' for the III Semester of B.Tech in the department of EEE for the Academic Year 2019-2020

Resolution: The syllabus of the Mandatory Non-credit Course (MNC) **Professional Ethics and Human Values (V18ENT12)** has been discussed and approved and is given in Appendix-BSH-English-03.

Appendix-BSH-English-01

B.Tech III Semester

S.No	Course Code	Course Name	L	T	P	C
1	V18ENT03	**Professional Communication Skills - I**	3	-	-	MNC

COURSE OUTCOMES:

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

CO1: Summarize one's introduction in an appropriate manner, exhibit grammatical competence through correction of sentences, analyze noun and pronoun dispositions and develop pre-reading strategies to improve comprehension skills.[K5]

CO2: Distinguish singular and plural in different contexts and display knowledge through accurate usage of sentences, build conversations which befit the situations, comprehend the passages well and use different kinds of idioms. [K4]

CO3: Classify various kinds of adjectives and adverbs, learn natural occurrence of paired words of native speakers, infer the referential and inferential aspects of the passages and make use of idioms while narrating personal experiences. [K4]

CO4: Judge and assess the behavior of people in day to day life using kinesics and proxemics that disclose their disposition and be aware of their personal traits that promote good relations. (K2)

CO5: Articulate their goals and have a constructive plan of executing them properly and become adept in oral presentations as well as poster presentations that enhance their professional skills. (K3)

CO6: Evaluate various happenings by thinking out of the box and display their latent talent; and reduce the stress levels by applying various stress management techniques. (K4)

UNIT – I

SELF-INTRODUCTION: Basic information - Academic and personal - interests– strengths and weaknesses – goal.

ERROR ANALYSIS: Nouns & Pronouns – Singular & Plural – Kinds of Nouns & Pronouns- Collective Nouns - Personal and Reflexive Pronouns.

READING COMPREHENSION: Reading as a skill – quick reading - analyzing – answering **IDIOMS & PHRASES**: Colloquial expressions– formal and informal expressions.

UNIT – II

ERROR ANALYSIS: Concord – Subject – Verb agreement.

ROLE PLAY: Day to day situations - practical approach – real life experiences.

READING COMPREHENSION: Skimming – scanning - summarizing – problem solving.

IDIOMS & PHRASES: Enriching written and spoken English – use and usage.

UNIT – III

ERROR ANALYSIS: Adjectives – Adverbs – role of modifiers – place of Adjectives– Adverbs of frequency.

COLLOCATIONS: Natural combination of words – closely affiliated with each other.

READING COMPREHENSION: At a glance – close reading – understanding – answering

IDIOMS & PHRASES: Communicative - expressive – competent.

UNIT –IV

INTER AND INTRA PERSONAL SKILLS: Leading, Coaching, Interviewing, Managing, Persuading - Self awareness, Self confidence, Good Attitude.

BODY LANGUAGE: Basics of proxemics and kinesics.

UNIT -V

PRESENTATION SKILLS: Importance of Presentation skills, Structuring our presentations, Ways to improve our presentation skills, Tips for effective presentations.– oral – Power point – poster.

GOAL SETTING: Short-term – long-term – aim – target – vision – How to set SMART goals.

UNIT - VI

LATERAL THINKING: What is creativity, Fundamental approaches to smart thinking, Characteristics of a creative person, Convergent and Divergent thinking.

STRESS MANAGEMENT: Meaning of Stress, Types of Stress, Symptoms of stress, Short term and long term stress, how can people manage stress.

Reference:

1. Essential English Grammar : Raymond Murphy
2. Advanced English Grammar : D.S. Paul
3. Word Power Made Easy : Norman Lewis
4. English collocations in use : Michael McCarthy
5. Word Power Made Handy : ShaliniVarma
6. Barron's GRE : Barron's
7. Current English Grammar & Usage : R.P Sinha
8. Think & Grow Rich : NapoleaonHill
9. Soft Skills for Everyone : Butterfield, Jeff,
10. Soft Skills : Chauhan,G.S.& Sangeeta Sharma
11. Theories of Personality : Hall, Calvin S
12. Corporate Conversations : Holtz, Shel
13. Communication Skills : Kumar, Sanajy and PushpLata

14. Winning at Interviews : Thorpe, Edgar and Showick Thorpe
15. Swami Vivekananda and “Personality Development” published by RK Math.

B.Tech IV Semester

S.No	Course Code	Course Name	L	T	P	C
1	V18ENT04	**Professional Communication Skills - II**	3	-	-	MNC

COURSE OUTCOMES:

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

CO1: Correlate individual words in a sentence, use new vocabulary and focus on the error analysis of prepositions and conjunctions. [K4]

CO2: Distinguish and acquire knowledge of using words of same category in a sentence and learn new words that promote communicative finesse. [K5]

CO3: Find errors in sentences where the modifiers are misplaced and put them at the appropriate place, use hit pair words and send an email that is concise and lucid[K5]

CO 4: Interpret the importance of Attire and Etiquette in societal context and manage their time. (K2)

CO5: Discover the team-working abilities among themselves and display their leadership qualities. (K3)

CO6: Identify various elements of emotional balance that have positive impact on work-life-balance. (K2)

UNIT – I

ERROR ANALYSIS: Prepositions - kinds of prepositions –appropriate use – conjunctions: sub-ordinating & co-ordinating.

VOCABULARY: Etymology **–** roots – suffixes – prefixes and one word substitutes.

SENTENCE IMPROVEMENT: Better choice – error-free sentences – effective – syntax**.**

UNIT – II

ERROR ANALYSIS: Parallel grammatical forms – same grammatical structures.

VOCABULARY: Words that describe personalities – faiths – professions – medical specialistsand Word Clusters.

EXPANSION OF PROVERBS: Meaning – interpretation – explanation**.**

UNIT – III

ERROR ANALYSIS: Dangling modifiers – misplacement of modifiers – arrangement.

VOCABULARY: Antonyms and Synonymsand Foreign expressions.

EMAIL WRITING: Format – method of exchanging – technicalities.

UNIT- IV

ATTIRE & ETIQUETTE: Formal – informal- professional – social Attires, Meaning of Etiquette, Need for etiquette, Types of Etiquette.

TIME - MANAGEMENT: Value of time – Setting priorities – effective use of time – ABCD analysis, Pareto Principle, Eisenhower Method.

UNIT -V

TEAM WORK – Benefits of working with a team – Team Dynamics **.**

LEADERSHIP QUALITIES: Leadership Styles, Characteristics of a Good Leader, Big 5 Personality traits, Myths about leadership qualities.

UNIT -VI

EMOTIONAL INTELLIGENCE: What is EI – Daniel Goleman model of EI, Qualities of an Emotionally Intelligent Person - Emotional balance – feelings – thoughts – motivation.

WORK – LIFE - BALANCE: Personal life – professional life – cause of work-life imbalances, consequences of work-life imbalance, Role of gender and family – improving work life balance.

Reference:

1. Essential English Grammar : Raymond Murphy
2. Advanced English Grammar : D.S. Paul
3. Word Power Made Easy : Norman Lewis
4. English collocations in use : Michael McCarthy
5. Word Power Made Handy : ShaliniVarma
6. Barron's GRE : Barron's
7. Current English Grammar & Usage : R.P Sinha
8. Think & Grow Rich : NapoleaonHill
9. Soft Skills for Everyone : Butterfield, Jeff,
10. Soft Skills : Chauhan,G.S.& Sangeeta Sharma
11. Theories of Personality : Hall, Calvin S
12. Corporate Conversations : Holtz, Shel
13. Communication Skills : Kumar, Sanajy and PushpLata
14. Winning at Interviews : Thorpe, Edgar and Showick Thorpe
15. Swami Vivekananda and "Personality Development" published by RK Math.

Appendix-BSH-English-02

B.Tech ECE (III Sem), CSE & ME (IV Sem)

S.No	Course Code	Course Name	L	T	P	C
1	V18ENT11	**Constitution of India**	2	-	-	MNC

COURSE OUTCOMES:

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

CO1: Summarize the evolution and historical importance of the Indian Constitution from 1858 to 1947. [K2]

CO2: Explain various stages in the composition of the Indian Constitution. [K2]

CO3: Develop awareness about their primary rights and duties & build up their civic sense. [K3]

CO4: Comprehend the distribution of powers between the center and states. (K4)

CO5: Summarize and sketch the specific roles of heads of Nation and the functioning of legislative bodies. (K2)

CO6: Explain the role of local self-government in strengthening democracy. (K1)

Syllabus

Unit-I

Historical Perspective of the Indian Constitution – A brief discussion of various Acts i.e from 1858 to 1947 passed by the British Government.

Unit–II

Constitution of India

a) Preparation of Indian constitution by Constituent Assembly of India.
b) Preamble or Philosophy of the Indian Constitution.
c) Salient features of the Indian constitution.

Unit-III

a) Fundamental Rights - their importance & Limitations
b) Fundamental Duties and their importance
c) Directive principles of the state policy and their implementation

Unit-IV

Indian Federalism

a) Distribution of powers between Union and State Governments
b) Legislative, Executive and Financial relations between Union and State Governments

Unit-V

Parliamentary form of Government in India

1. Union Executive

a) President of India- Powers and functions
b) Vice-President - Powers and functions
c) Prime Minister and Council of Minister - Powers and functions

2. Union Legislature

a) Rajya Sabha – Powers and Functions
b) Lok Sabha- Powers and Functions

c) Amending Procedure- Important Constitutional Amendments – 42nd, 44 Constitutional Amendment Acts.

d) **Judiciary** – Supreme court of India - Powers and Functions

Unit-VI

Local Self–government in India 73rd & 74th Constitutional Amendment Acts

Reference Books:

1. D D Basu-Introduction to the Constitution of India – 18th Edition. Prentice – Hall of India Private Ltd-New Delhi-1998
2. Granville Austin (1972) the Indian Constitution, Cornerstone of a Nation, Oxford university Press, New Delhi
3. Madhavkhosla (2012) the Indian Constitution, Oxford University Press, New Delhi
1. 4.Granville Austin (1999) Working a Democratic Constitution; A History of the Indian Experience, Oxford University Press, New Delhi
4. Zoya Hasan, Sridharan E and Sudharshan R (Eds) 2002 India's living Constitution, Permanent black, New Delhi
5. BaxiUpendra (1980) the Indian Supreme Court and Politics, Eastern Book Co, Lucknow.

B.Tech (EEE) III Semester

S.No	Course Code	Course Name	L	T	P	C
1	V18ENT12	Professional Ethics & Human Values	4	-	-	MNC

COURSE OUTCOMES:

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

CO No.	Course Outcome	Knowledge Level
C212.1	Understand and assimilate human values to grow as responsible human beings with proper personality.	K2
C212.2	Understand different ethical theories	K2
C212.3	Interpret engineering as social experiment	K2
C212.4	Explain Engineers' responsibilities towards Safety and Risk	K2
C212.5	Understand ethical conduct and discharge their professional duties	K2
C212.6	Understand ethics in view of globalization	K2

Module 1: Human Values

Morals, Values and Ethics, Integrity, Trustworthiness, Work Ethics, Service Learning, Civic Virtue, Respect for others, Living Peacefully, Caring, Sharing, Honesty, Courage, Value Time, Co-operation, Commitment, Empathy, Self-confidence, Spirituality, Character, Discrimination.

Module 2: Engineering Ethics

Need of Engineering Ethics, Senses of Engineering Ethics, Variety of moral issues, Types of Inquiry, Moral dilemma, Moral Autonomy, Moral development (theories), Kohlberg's Theory, Gilligan's Theory, Profession and Professionalism, Self Interest, Theories about right action (Ethical theories), Uses of Ethical Theories, Utilitarian theory, Learning from the Past, Self-interest, Customs, Religion, Self-respect.

Module 3: Engineering as Social Experiment

Experimental Nature of Engineering, Comparison with Standard Experiments, Engineer as responsible experimenters, Codes of ethics industrial standards.

Module 4: Engineers' Responsibilities towards Safety and Risk

Definitions of Safety and Risk, Types of Risks, Risk analysis, Scenario Analysis, Failure mode and effect analysis, Fault-tree Analysis, Assessment of Risk , Assessment of safety, Safe Exit, Risk-Benefit Analysis.

Module 5: Engineers' Duties and Rights

Confidentiality, Types of Confidential Information, Conflict of Interests, Occupational Crimes, Industrial Espionage, Price Fixing, Whistle Blowing,

Collegiality, Loyalty, Collective Bargaining,Concept of Duty, Professional Duties, Human Rights, Employee Rights.

Module 6: Global Issues

Globalization, MNCs, Environmental Ethics, Computer Ethics, Weapon development, Business Ethics, Media Ethics, Research Ethics, Intellectual Property Rights.

Text Books

1. Professional Ethics by R. Subramaniam – Oxford Publications, New Delhi
2. Professional Ethics and Human Values by Prof. R.Naagarazan

Reference Books

1. Professional Ethics and Human Values by Prof.D.R.Kiran-Tata McGraw-Hill - 2013
2. Engineering Ethics & Human Values by M.Govindarajan, S.Natarajan and V.S.SenthilKumar-PHI Learning Pvt. Ltd – 2009.

Annexure-VI

Minutes of the meeting, BOS of Civil Engineering (Held on 20.04.2019)

1. **Introducing members of Board of Studies**

   The Chairman, BOS has extended a formal welcome and introduced the members.

2. **Review of the minutes of the previous meeting.**

   Reviewed the minutes of the previous meeting and suggested the following

Modifications in III Semester Course Structure

1. V18CET02, Building Planning and Construction Management is removed from III Semester.
2. V18MAT04 Probability and Statistics is taken in place of V18CET03 Transform & Discrete Mathematics.
3. V18CET04 is renamed as Strength of Materials-I instead of Introduction to Solid Mechanics.
4. V18CET36 Building Materials Planning and Construction is included in place of V18CET05 Effective Technical Communication.
5. V18CET10 Introduction to Fluid Mechanics is placed in III Semester instead of IV Semester and credits also enhanced from 3 to 4.
6. V18MBT51 Managerial Economics & Financial Analysis is included in IV Sem instead of III Sem.

Modifications in IV Semester

1. V18CET13 Strength of Materials-II is taken in place of V18CET07 Energy Science & Engineering.
2. V18CET14 Hydraulic Engineering is included in place of V18CET10 Introduction to Fluid Mechanics.
3. V18MBT51 Managerial Economics & Financial Analysis is included in place of V18MBT12 Organizational Behavior.
4. V18CET14 Hydraulic Engineering is included in IV sem instead of V sem.

Modifications in VI Semester

1. V18CET37 Building Estimation and construction management is included in place of V18CET20 "Engineering Economics, Estimation and costing.
2. The Revised course structure for the academic year 2019-20 is enclosed in **Appendix-CE-01**
3. **Review of the syllabi approved for the Academic Year 2018-19.**

   Reviewed the syllabi of the Academic Year 2018-19 It is suggested that in Mathematics Transform & Discrete Mathematics may also be included. However it will be taken up in the next Academic year.
4. **Suggest modifications for the existing course structure**

   All ready mentioned in item 2

5. **Approval of syllabi for proposed courses for the academic year 2019-2020.**
6. Approved the syllabi for proposed courses for the academic year 2019-20 and enclosed in **Appendix-CE-02**

Appendix-CE-01

COURSE STRUCTURE OF SECOND YEAR B.TECH (CIVIL)
(For 2018 – 2019 Admitted Batch)

III SEMESTER

S.No	Course Code	Course Title	Hours per week			Credits
			L	T	P	C
1	V18CET04	Strength of Materials-I	3	1	0	4
2	V18CET36	Building Materials Planning & Construction	3	1	0	4
3	V18CET10	Introduction to Fluid Mechanics	3	1	0	4
4	V18CET35	Principles of Environmental Science & Engineering	2	0	0	2
5	V18MAT04	Probability & Statistics	3	1	0	4
6	VI8EET01	Basic Electrical and Electronics Engineering	3	1	0	4
7	V18CEL02	Material Testing Lab	0	0	3	1.5
8	VI8EEL01	Basic Electrical and Electronics Engineering Lab	0	0	2	1
9	V18ENT03	Professional Communication Skills -I	3	0	0	MNC
Total			**20**	**3**	**6**	**24.5**

IV SEMESTER

S.No	Course Code	Course Title	Hours per week			Credits
			L	T	P	C
1	V18CET13	Strength of Materials-II	3	0	0	3
2	V18CET08	Engineering Geology	2	0	0	2
3	V18CET09	Concrete Technology	3	1	0	4
4	V18CET14	Hydraulic Engineering	3	1	0	4
5	V18CET11	Surveying and Geometrics	2	1	0	3
6	V18MBT51	Managerial Economics & Financial Analysis	3	0	0	3
7	V18CEL03	Concrete Technology Lab	0	0	3	1.5
8	V18CEL04	Surveying Lab	0	0	3	1.5
9	V18CEL05	Fluid Mechanics And Hydraulic Machinery Lab	0	0	3	1.5
10	V18CEL06	Engineering Geology Lab	0	0	2	1
11	V18ENT04	Professional Communication Skills -II	3	0	0	MNC
Total			**17**	**4**	**11**	**24.5**

Appendix-CE-02

III SEMESTER- SYLLABUS

Year/Sem	III Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	3	1	0	4	V18CET04
Name of the Course	STRENGTH OF MATERIALS-I					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

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

- Understand the basic materials behavior under the influence of different external loading conditions and the support conditions
- Draw the diagrams indicating the variation of the key performance features like bending moment and shear forces
- Understand bending concepts and calculation of section modulus and for determination of stresses developed in the beams and torsion.
- Assess stresses across section of the thin and thick cylinders to arrive at optimum sections to withstand the internal pressure using Lame's equation.

SYLLABUS:

UNIT – I:

Simple Stresses ,Strains and Strain Energy: Elasticity and plasticity –Types of stresses and strains – Hooke's law – stress – strain diagram for mild steel – Workingstress – Factor of safety – Lateral strain, Poisson's ratio and volumetric strain – Elasticmoduli and the relationship between them – Bars of varying section – composite bars –Temperature stresses.

Strain Energy – Resilience – Gradual, sudden, impact and shock loadings – simple applications.

UNIT – II:

Shear Force and Bending Moment: Definition of beam – Types of beams –Concept of shear force and bending moment – S.F and B.M diagrams for cantilever, simply supported and overhanging beams subjected to point loads, uniformly distributed loads, uniformly varying loads and combination of these loads – Point of contra flexure – Relation between S.F., B.M and rate of loading at a section of a beam

UNIT – III:

Flexural Stresses: Theory of simple bending – Assumptions – Derivation of bending equation: M/I = f/y = E/R, Neutral axis – Determination bending stresses – section modulus of rectangular and circular sections (Solid and Hollow), I, T, Angle and Channel sections – Design of simple beam sections.

UNIT –IV:

Shear Stresses: Derivation of formula – Shear stress distribution across various beam sections like rectangular, circular, triangular, I, T angle sections, built up beams, shear centre.

UNIT – V:

Torsion- Derivation of torsion equation and its assumptions. Applications of the equation of the hollow and solid circular shafts, torsional rigidity, combined torsion and bending of circular shafts, principal stress and maximum shear stresses under combined loading of bending and torsion. Analysis of closed-coiled –helical springs

UNIT – VI:

Thin and Thick Cylinders: Thin cylindrical shells – Derivation of formula for longitudinal and circumferential stresses – hoop, longitudinal and Volumetric strains – changes in diameter, and volume of thin cylinders – Thin spherical shells.

Thick Cylinders: Introduction Lame's theory for thick cylinders – Derivation of Lame's formulae – distribution of hoop and radial stresses across thickness – design of thick cylinders – compound cylinders – Necessary difference of radii for shrinkage – Thick spherical shells.

TEXT BOOKS:

1. Mechanics of Materials- R. C. Hibbler, Pearson; 10 edition (January 15, 2016)
2. Strength of materials -S. S. Bhavakatti, Vikas Publishing House; Fourth edition (2013)
3. Strength of Materials -R. K. Rajput, S. Chand Publishing (6th Edition) (2015)
4. Strength of Materials -R.K Bansal,Laxmi Publications; Sixth edition (2018)

REFERENCES:

1. Fundamentals of Solid Mechanics M.L. Gambhir, PHI Learning Pvt. Ltd., New Delhi. (1 December 2009)
2. Introduction to Strength of Material by U.C. Jindal,Pearson Education; Second edition (28 September 2017)
3. Strength of materials by R. Subramanian, Oxford university press, New Delhi, third edition (15 June 2016)

Year/Sem	III Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	3	1	0	4	V18CET36
Name of the Course	BUILDING MATERIALS, PLANNING AND CONSTRUCTION					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

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

- Identify different building materials and their importance in building construction.
- Differentiate brick masonry, stone masonry construction
- Use of lime and cement in various constructions.
- Describe the importance of building components and finishing's.
- Understand building by-laws, ventilation and lightening requirements

UNIT – I:

Stones, Bricks and Tiles: Building stones – classifications and quarrying – properties –structural requirements and dressing. Bricks – Composition of Brick earth – manufacture and structural requirements, Fly ash, Ceramics, Timber, Aluminum, Glass, Paints and Plastics: Wood - structure – types and properties– seasoning – defects; alternate materials for Timber–GI/ fibre – reinforced glass bricks, steel & aluminum, Plastics.

UNIT – II:

Cement & Admixtures: Ingredients of cement – manufacture – Chemical composition – Hydration - field & lab tests. Admixtures – mineral & chemical admixtures – uses.

Lime: Various ingredients of lime – Constituents of lime stone – classification of lime – various methods of manufacture of lime

UNIT – III:

Mortars: Lime and Cement Mortars.

Masonry: Brick masonry – types – bonds; Stone masonry – types; Composite masonry – Brick- stone composite; Concrete, Reinforced brick. Cavity and partition walls.

Finishing's: Plastering, Pointing, Painting, Claddings – Types – Tiles – ACP.

UNIT-IV:

Aggregates: Classification of aggregate – Coarse and fine aggregates- particle shape and texture – Bond and Strength of aggregate – Specific gravity – Bulk Density, porosity and absorption – Moisture content of Aggregate- Bulking of sand – Sieve analysis.

Miscellaneous materials: Bitumen and asphaltic materials, structural steel and other metals, geo textiles, carbon composites including properties and uses.

UNIT V:

Building Byelaws and Regulations: Introduction- terminology- objectives of building byelaws- floor area ratio- floor space index- principles under laying building bye laws- classification of buildings- open space requirements – built up area limitations- height of buildings– lightening and ventilation requirements.

Residential buildings: Minimum standards for various parts of buildings requirements of different rooms and their grouping- characteristics of various types of residential buildings, relationship between plan, elevation, Climate influence on Orientation of Buildings.

UNIT – VI:

Building Components: Lintels, Arches, walls, vaults – stair cases – types of floors, types of roofs – flat, curved, trussed. Foundations – types; Damp Proof Course; Joinery – doors – windows – materials – types.

Form work: Types: Requirements – Standards – Scaffolding – Design;
Shoring, Underpinning.

TEXT BOOKS:

1. Building Materials and Construction – Arora & Bindra, Dhanpat Roy Publications. 2010,5th edition.
2. Building Materials, M. L. Gambhir, Tata McGraw Hill Publishing Co. Ltd. New Delhi. 2014,
   5th edition,.
3. Building Construction by B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) ltd., New Delhi. 2016,11th edition.
4. Building Materials, S. S. Bhavikatti, Vikas publications House private ltd. 2012, 1st edition.
5. Building Construction, S. S. Bhavikatti, Vikas publications House private ltd. 2012, 1st edition.
6. Building planning and drawing,Dr.N.Kumara swamy,A.kameswara Rao, 2012, 6th edition.

REFERENCES:

1. Building Materials and Construction by G C Sahu, Joygopal Jena McGraw hill Pvt Ltd 2017,
   1st edition.
2. Building Materials by Duggal, New Age International. 2012 ,4th edition.
3. Building Materials by P. C. Varghese, PHI. 2015, 2nd edition.
4. Building Construction by PC Varghese PHI. 2007, 1st edition.
5. Construction Technology – Vol – I & II by R. Chubby, Longman UK.1987, 2nd edition.
6. Alternate Building Materials and Technology, Jagadish, Venkatarama Reddy and others; New Age Publications.2017 ,2nd edition.

Year/Sem	III Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	3	1	0	4	V18CET10
Name of the Course	INTRODUCTION TO FLUID MECHANICS					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

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

- Understand the physical properties of fluids and their influences on fluid motion
- Calculate the forces acting on plane and curved surfaces and solve fluid flow problems in kinematics.
- Solve a variety of problems in fluid dynamics
- Solve various pipe flow problems
- Solve various laminar flow problems
- Assess fluid flow through pipes using different devices

UNIT I:

INTRODUCTION : Dimensions and units – Physical properties of fluid specific gravity, viscosity, surface tension, vapor pressure and their influences on fluid motion, pressure at a point, Pascal's law, hydrostatic law, atmospheric, gauge and vacuum pressure, measurement of pressure. Pressure gauges, Manometers: Differential and Micro Manometers.

UNIT – II:

`HYDROSTATICS: Hydrostatic forces on submerged plane, Horizontal, Vertical, inclined and curved surfaces – Center of pressure, derivations and problems.

UNIT – III:

FLUID KINEMATICS: Description of fluid flow, Stream line, path line and streak lines and stream tube. Classification of flows: Steady, unsteady, uniform, non-uniform, laminar, turbulent, rotational and irrotational flows, Equation of continuity for one, two, three dimensional flows, stream and velocity potential functions.

UNIT – IV:

FLUID DYNAMICS: Surface and body forces – Euler's and Bernoulli's equations for flow along a stream line for 3-D flow, Momentum principle, Momentum equation and its application – forces on pipe bend.

UNIT – V:

CLOSED CONDUIT FLOW: Laws of Fluid friction – Darcy's equation, Minor losses – pipes in series – pipes in parallel, Total energy line and hydraulic gradient line, Pipe network problems, Variation of friction factor with Reynold's number, Moody's Chart.

UNIT – VI:

MEASUREMENT OF FLOW: Pitot tube, Venturi meter and Orifice meter, classification of orifices, small orifice and large orifice, flow over rectangular, triangular and trapezoidal and Stepped notches, Broad crested weirs.

TEXT BOOKS:

1. Hydraulics and Fluid Mechanics including Hydraulic Machines by Dr. P.N. Modi and Dr. S.N. Seth, Standard Book house, Rajsons Pvt. Ltd., 21st Edition, 2017

2. A textbookof Fluid Mechanics and Hydraulic Machines by Dr. R.K. Bansal, Laxmi Publications (P) Ltd., New Delhi, 10th Edition, 2018

REFERENCES:

1. Introduction to Fluid Mechanics and Fluid Machines by S.K. Som, G. Biswas, Suman Chakraborthy, Mc Graw Hill Education, 3rd Edition, 2017.
2. Fluid Mechanics by A.K. Mohanty, Prentice Hall of India Pvt. Ltd., New Delhi, 2nd Edition, 1994.
3. Fluid Mechanics and Hydraulic Machines by K. Subramanya, Mc Graw Hill Education, 1st Edition, 2010.

Year/Sem	III Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	2	0	0	2	V18CET35
Name of the Course	PRINCIPLES OF ENVIRONMENTAL SCIENCE & ENGINEERING					
Branch	CIVIL ENGINEERING					

Course Outcomes:

Upon successful completion of the course, the student will be able to

- Outline the global environmental challenges and environmental legislations.
- Interpret various natural resources and associated problems.
- Discuss various attributes of environmental pollution.
- Interpret quality of water.
- Operate sewage water treatment plants.
- Illustrate various solid waste management practices.

UNIT I: FUNDAMENTALS OF ENVIRONMENTAL STUDIES AND ACTS

Definition and components of environment, Global Environmental Challenges: Global warming and climate change, Acid rains, Ozone layer depletion - Population explosion and effects.

Environmental Protection Act, 1986 - Air (Prevention and Control of Pollution) Act, 1981 – Water (Prevention and Control of Pollution) Act, 1974 -Wildlife (Protection) Act, 1972 - Forest (Conservation) Act.

UNIT II: NATURAL RESOURCES AND ASSOCIATED PROBLEMS

Forest resources: Use and over exploitation - Deforestation: Timber extraction, Mining, dams and other effects on forest and tribal people. Water resources: Use and over utilization of surface and ground water – Floods, drought, conflicts over water - Dams: Benefits and problems. Effects of extracting and using mineral resources. Energy resources: Renewable and Non-renewable energy sources. Land resources: Land degradation, Wasteland reclamation.

UNIT III: ENVIRONMENTAL POLLUTION

Definition, Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Noise pollution and Nuclear Pollution.

UNIT IV: WATER QUALITY AND DESIGN OF WATER TREATMENT UNITS

Impurities in water -Water borne diseases – Protected water supply – Water quality and testing – Drinking water standards- Layout and general outline of water treatment units – Sedimentation – principles – Design factors – Coagulation, flocculation, clarifier design – Coagulants – Feeding arrangements.

Filtration – Theory – Working of slow and rapid gravity filters – Multimedia filters – Design of filters – Troubles in operation, comparison of filters – Disinfection – Theory of chlorination, chlorine demand, other disinfection practices- Desalination processes.

UNIT V: SEWAGE QUALITY AND DESIGN OF SEWAGE TREATMENT UNITS

Conservancy and water carriage systems– Characteristics of sewage– BOD – COD equations. Dilution –Self purification of rivers - Layout and general outline of various units in a waste water treatment plant.

Primary treatment - Design of screens – Grit chambers – Skimming tanks – Sedimentation tanks – Principles of design – Biological treatment – Trickling filters – Standard and high rate.

UNIT –VI: SOLID WASTE MANAGEMENT

Municipal Solid Wastes: Characteristics-Generation- collection- Methods of collection-Equipment types of vehicles-Man power requirement-Collection routes.

Need for Transfer operations-Transfer Stations-Selection of location of transfer station-Transport means and methods - Engineered systems for solid waste management - Recycle energy recovery treatment and disposal.

TEXT BOOKS:

1. Principles of environmental science and engineering by P. Venugopala Rao by Prentice Hall India Learning Private Limited, 1St Edition edition (2006), new Delhi.
2. Principles of environmental sciences by Jan J. Boersea and Lucas reijnders , Springer; 2010 edition (May 27, 2010).
3. Environment Studies by Anubha Kaushik, C P Kaushik, New Age International Private Limited; Five edition (1 August 2018).
4. A Textbook of Environmental Studies, Shaashi Chawla, Tata McGraw Hill Education Private Limited (26 April 2012), New Delhi.
5. Fundamentals of Environment Studies, DD Mishra S Chand & Company (1 December 2010).
6. Water supply engineering byS.K.Garg Khanna publishers(2017),33 rd edition.
7. Sewage disposal and air pollution by S.K.Garg, Khanna publishers(2017),39th edition
8. Water supply engineering by B.C .punmia,Ashok Kumar jain and Arun K jain, Laxmi Publications (December 1, 2005) ,2nd edition.
9. Management of municipal solid waste by T.N.Ramachandra, The Energy and Resources Institute, TERI (1 December 2009).
10. Solid waste management by K. Sasi kumar,S.G. Krishna, Prentice Hall India Learning Private Limited (2009)

Year/Sem	III & IV Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	3	1	-	4	V18MAT04
Name of the Course	PROBABILITY AND STATISTICS					
Branches	CIVIL, EEE, ME & CSE					

Pre requisites: Probability, Conditional Probability, Baye's theorem on probability

COURSE OUTCOMES:

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

CO1: Find measures of central tendency and dispersion for real data sets.

CO2: Find parameters of given function

CO3: Apply probability distribution to real time problems

CO4: Plot a best fit curve to an experimental data and find the correlation and regression

CO5: Create good estimators to various parameters

CO6: Apply the principles of Statistical Inference to practical problems

Unit-I: Basic Statistics

Measures of Central Tendency: Mean, Median, Mode

Measures of Dispersion: Variance, Standard deviation, Skewness and Kurtosis

Unit-II: Basic Probability

Random Variables: Discrete and continuous - Probability function – density and distribution function, Expectation of a Random Variable, Moments, Chebychev's Inequality (Without proof).

Unit-III: Probability Distributions

Probability distributions: Binomial, Poisson and Normal - Evaluation of statistical parameters: Mean, Variance and their properties, Introduction to Exponential, Gamma and Weibull distributions.

Unit-IV: Bivariate Distributions

Curve fitting by the method of Least squares- Fitting of straight line, parabola and exponential curves, Simple Correlation and Regression – Rank correlation.

Unit-V: Sampling Distributionand Estimation

Introduction –Sampling distribution of means with known and unknown standard deviation

Estimation: Criteria of a good estimator, point and interval estimators for means and proportions

Unit-VI: Tests of Hypothesis

Introduction-Type-I, Type-II Errors, Maximum Error, one–tail, two-tail tests,Test of significance: Large sample test for single proportion, difference of proportions, single mean, difference of means.

Test of significance: Small sample test for single mean, difference of means and test of ratio of variances (F-Test) - Chi-square test for goodness of fit and independence of attributes.

Text Books:

1. V. Ramana, A text Book of Engineering Mathematics, Tata Mc Graw Hill.
2. Miller & Freund's, Probability & Statistics for Engineers – Eighth Edition, Richard. A. Johnson

References Books:

1. S. Ross, "A First Course in Probability", Pearson Education India, 2002.
2. Dr.T.S.R.Murthy, Probability and Statistics for Engineers, BS Publications.
3. T. Veerarajan, "Engineering Mathematics", Tata McGraw-Hill, New Delhi, 2010.

Year/Sem	III Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	3	1	0	4	V18EET01
Name of the Course	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING					
Branches	CIVIL, CSE&ME					

Module 1 : DC Circuits

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

Module 2: AC Circuits

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

Module 3: DC Machines

Introduction-Working principle of DC generator–Magnetization characteristics of D.C. Shunt generator –Types of DC motors– applications – three point starter.

Transformers-Classification, working principle of ideal and practical transformer, losses in transformers, regulation and efficiency, OC& SC test on single phase transformer.

Module 4: AC Machines

Construction and working of a three-phase induction motor, torque-slip characteristics. Loss components and efficiency, starting and speed control of induction motor.Construction and Principle of operation of synchronous generators.

Module 5: Semiconductor Devices and Rectifiers

Introduction– Classification – PN junction diode characteristics a) Forward bias b) Reverse bias - Diode acts as a switch - Half-wave and Full-wave rectifiers – Concepts of ripple factor, voltage regulation and efficiency - Simple problems.

Module 6: Transistors

Types of Transistors - Transistor acts as an amplifier - CB, CE and CC configurations and characteristics- feedback amplifier.

Text Books

1. T. K. Nagsarkar, M. S. Sukhija, "Basic Electrical Engineering", Oxford University Press, 2005
2. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.
3. D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.
4. E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.

Reference Books

1. L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.
2. E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.

3. V. D. Toro, “Electrical Engineering Fundamentals”, Prentice Hall India, 1989.
4. S. K. Bhattacharya, “Basic Electrical and Electronics Engineering”, Pearson Education India, 2011
5. S. K. Sahdev, “Fundamentals of Electrical Engineering & Electronics”, DhanpatRai& Company, 2001

Year/Sem	III Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	0	0	3	1.5	V18CEL02
Name of the Course	MATERIAL TESTING LAB					
Branch	CIVIL					

COURSE OUTCOMES:

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

- Identify the engineering properties of materials in the laboratory
- Assess torsion test to determine elastic constants
- Assess spring test to determine elastic constants
- Assess flexural test to determine elastic constants
- Determine hardness of metals
- Determine Impact strength of metals

List of Experiments

1. Tension test on Steel bar
2. Bending test on (Steel / Wood) Cantilever beam.
3. Bending test on simple support beam.
4. Torsion test
5. Hardness test
6. Spring test
7. Compression test on wood or concrete
8. Impact test
9. Shear test
10. Verification of Maxwell's Reciprocal theorem on beams.
11. Continuous beam – deflection test.

List of Major Equipment:

1. UTM for conducting tension test on rods
2. Steel beam for flexure test
3. Wooden beam for flexure test
4. Torsion testing machine
5. Brinnell's / Rock well's hardness testing machine
6. Setup for spring tests
7. Compression testing machine
8. Izod Impact machine
9. Shear testing machine
10. Beam setup for Maxwell's theorem verification.
11. Continuous beam setup

Year/Sem	III Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	0	0	2	1	V18EEL01
Name of the Course	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB					
Branches	CIVIL, CSE & ME					

Any 10 of the following experiments are to be conducted

1. Verification of Superposition Theorem.
2. Experimental determination of Thevenin's and Norton's equivalent circuits and verification by direct test.
3. Verification of maximum power transfer theorem.
4. Series and Parallel Resonance – Timing, Resonant frequency, Bandwidth and Q-factor determination for RLC network.
5. Magnetization characteristics of D.C. Shunt generator. Determination of critical field resistance and speed.
6. Speed control of D.C. Shunt motor by Armature & flux control methods
7. Brake test on DC shunt motor. Determination of performance characteristics.
8. OC & SC tests on Single-phase transformer (Predetermination of efficiency and regulation at given power factors and determination of equivalent circuit).
9. Brake test on 3-phase Induction motor (performance characteristics).
10. PN junction diode characteristics a) Forward bias b) Reverse bias (Cut in voltage and resistance calculations)
11. Transistor CE characteristics (Input and output)
12. Half wave rectifier with and without filters.
13. Full wave rectifier with and without filters.
14. CE amplifiers.

IV SEMESTER- SYLLABUS

Year/Sem	IV Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	3	0	0	3	V18CET13
Name of the Course	STRENGTH OF MATERIALS – II					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

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

- Understand the basic concepts of Principal stresses developed in a member when it is subjected to stresses along different axes and design the sections.
- Asses stresses in different engineering applications like shafts, springs, columns and struts subjected to different loading conditions
- Assess forces in different types of trusses used in Construction.

UNIT I

Principal stresses and strains: Introduction – Stresses on an inclined section of a bar under axial loading – compound stresses – Normal and tangential stresses on an inclined plane for biaxial stresses – Two perpendicular normal stresses accompanied by a state of simple shear – mohr'scircle of stresses – Principal stresses and strains – Analytical and graphical solutions.

Theories of failures: Various Theories of failures such as Maximum Principal stress theory –Maximum Principal strain theory – Maximum shear stress theory – Maximum strain energy theory –Maximum shear strain energy theory.

UNIT II

Deflection of Beams: Bending into a circular arc – slope, deflection and radius of curvature – Differential equation for the elastic line of a beam – Double integration and Macaulay's methods – Determination of slope and deflection for cantilever and simply supported beams subjected to point loads, - U.D.L. Uniformly varying load. Mohr's theorems – Moment area method – application to simple cases including overhanging beams.

UNIT III

Columns and Struts: Introduction – Types of columns – Short, medium and long columns –Axially loaded compression members – Crushing load – Euler‟s theorem for long columns –assumptions – derivation of Euler‟s critical load formulae for various end conditions – Equivalent length of a column – Slenderness ratio –Euler‟s critical stress – Limitations of Euler‟s theory – Rankine– Gordon formula – Long columns subjected to effentric loading – Secant formula –Empirical formulae – Straight line formula – Prof. Perry‟s formula.

UNIT – IV

Direct and Bending stresses: Stresses under the combined action of directloading and B.M. Core of a section – determination of stresses in the case of chimneys,retaining walls and dams – conditions for stability – stresses due to direct loading and B.M.about both axis.

UNIT V

Unsymetrical bending: Introduction – Centroidal principal axes of section – Graphical method for locating principal axes – Moments of inertia referred to any set of rectangular axes – Stresses in beams subjected to unsymmetrical bending – Principal axes – Resolution of bending moment into two rectangular axes through the centroid - Location of neutral axis – Deflection of beams under unsymmetrical bending.

UNIT – VI

Analysis of pin-jointed plane frames: Determination of Forces in members ofplane pin-jointed perfect trusses by (i) tension co efficient method (ii) method of sections. Analysisof various types of cantilever and simply supported trusses by tension co efficient method, method of sections.

TEXT BOOKS:

1. Mechanics of Materials- R. C. Hibbler, Pearson; 10 edition (January 15, 2016)
2. Strength of materials -S. S. Bhavakatti, Vikas Publishing House; Fourth edition (2013)
3. Strength of Materials -R. K. Rajput, S. Chand Publishing (6th Edition) (2015)
4. Strength of Materials - R.K Bansal,Laxmi Publications; Sixth edition (2018)

REFERENCES:

1. Fundamentals of Solid Mechanics M.L. Gambhir, PHI Learning Pvt. Ltd., New Delhi. (1 December 2009)
2. Introduction to Strength of Material by U.C. Jindal, Pearson Education; Second edition (28 September 2017)
3. Strength of materials by R. Subramanian, Oxford university press, New Delhi, third edition (15 June 2016)

Year/Sem	IV Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	2	0	0	2	V18CET08
Name of the Course	ENGINEERING GEOLOGY					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

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

- Relate the features of geological agents.
- Review the types of minerals and rocks
- Interpret hazard zonation with reference to secondary structures
- Review the landslides and their resulting subsidence.
- Assess the ground conditions using geophysical explorations
- Examine the engineering geological conditions of the strata and its suitability to major projects like Dams, Tunnels and Reservoirs etc.

UNIT-I

Introduction: Branches of geology, Importance of geology in Civil engineering with case studies.

Physical Geology: Geological processes, Weathering, Erosion and Civil engineering importance of weathering and Erosion

UNIT- II

Mineralogy: Definition of mineral, Importance of study of minerals, Significance of different physical properties in mineral identification, Study of physical properties, Structure and chemical composition of common rock forming and economic minerals viz. Feldspar, Quartz, Olivine, Augite, Hornblende, Muscovite, Biotite, Asbestos, Apatite , Kyanite, Garnet, Beryl, Talc, Calcite, Dolomite, Pyrite, Hematite, Magnetite, Galena, Graphite, Magnesite, Bauxite and Clay minerals

Petrology: Introduction, Civil Engineering importance of petrology, Definition of Rock, Rock cycle, Geological Classification of rocks Igneous Rocks: Forms, Structures and textures of igneous rocks, Megascopic description and civil engineering uses of Granite, Basalt, Dolerite, Pegmatite and Charnockite

Sedimentary Rocks: Formation, Structures and textures of sedimentary rocks, Megascopic description and civil engineering uses of Laterite, Conglomerate, Sand stone, Lime stone and Shale

Metamorphic Rocks: Types of metamorphism, Structures and textures of metamorphic rocks, Megascopic Description and Civil engineering uses of Gneiss, Schist, Quartzite, Marble and Slate

UNIT-III

Structural Geology: Introduction, Out crop, Strike and dip, Causes for development of secondary structures, Classification of Structures associated with Folds, Faults, Joints, Unconformities and their Civil engineering importance

UNIT- IV

Earthquakes: Classification and causes, Intensity and magnitude and their measuring scales, Effects of earthquakes, Seismic belts, Civil Engineering considerations in seismic areas, Seismic zones of India

Land Slides: Classification, Causes and effects, Preventive measures of landslides

Ground water: Introduction, Classification of rocks based on porosity and permeability, Types of aquifers, Effects of groundwater over draft

UNIT- V

Geophysics: Importance of Geophysical methods, Classification, Principles of Geophysical study by Gravity method, Magnetic method, Electrical methods, Seismic methods, Radiometric method and Electrical resistivity, Seismic refraction methods

UNIT- VI

Dams: Types of Dams, Geological considerations for the selection of dam sites, Stages of investigation, Case histories of few dam failures, Geology of few Indian dam sites

Tunnels: Purpose of Tunneling, Geological considerations for tunneling, Effects of tunneling, Over break, Geology of some tunnel sites

TEXTBOOKS:

1. A text Book of Engineering Geology by N. Chenna Kesavulu, Macmillan India Ltd., Delhi, second edition, 2009.
2. Principles of Engineering Geology by K M Bangar, Standard Publishers and Distributers, 2009.
3. Principles of Engineering Geology- K Gokhale, B. S. Publication, Revised Edition, 2010.

REFERENCE BOOKS:

1. Fundamentals of Engineering Geology, F.G.Bell, published by Butterworth-Heinemann, 1983.
2. Principles of Engineering Geology and Geotechnics by D P Krynine and W R Judd, CBS Publishers & Distribution, first edition, 2005.
3. Engineering Geology for Civil Engineers by D. Venkata Reddy, Oxford & IBM Publishing Company Pvt. Ltd., New Delhi, second edition, 2017.
4. Engineering and General Geology by Parbin Singh, Published by S. K. Kataria & Sons, New Delhi, 2013.
5. Engineering Geology and Rock Mechanics by Dr B.P.Varma, Khanna Publishers, Delhi, 1998.

Year/Sem	IV Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	3	1	0	4	V18CET09
Name of the Course	CONCRETE TECHNOLOGY					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

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

- Understand the basic concepts of concrete.
- Realize the importance of quality of concrete.
- Familiarize the basic ingredients of concrete and their role in the production of concrete and its behavior in the field.
- Test the fresh concrete properties and the hardened concrete properties.
- Evaluate the ingredients of concrete through lab test results and design the concrete mix by BIS method.
- Familiarize the basic concepts of special concrete and their production and applications and understand the behavior of concrete in various environments.

UNIT I:

Introduction of Concrete, Cements and Admixtures: Portland cement – Chemical composition – Hydration, Setting of cement, Fineness of cement, Structure of hydrated cement–Test for physical properties – Different grades of cements (opc-33,opc-43,opc-53) – Admixtures – Mineral and chemical admixtures – accelerators, retarders, air entrainers, plasticizers, super plasticizers, fly ash and silica fume.

Aggregates: Classification of aggregate – Particle shape & texture – Bond, strength & other mechanical properties of aggregates – Specific gravity, Bulk density, porosity, adsorption & moisture content of aggregate – Bulking of sand –Soundness of aggregate – Alkali aggregate reaction – Thermal properties – Sieve analysis –Fineness modulus – Grading curves – Grading of fine & coarse Aggregates – Gap graded and well graded aggregate as per relevant IS code – Maximum aggregate size - Quality of mixing water.

UNIT – II:

Fresh Concrete: Steps in Manufacture of Concrete–proportion, mixing, placing, compaction, finishing, curing – including various types in each stage. Properties of fresh concrete-Workability – Factors affecting workability – Measurement of workability by different tests, Setting times of concrete, Effect of time and temperature on workability – Segregation & bleeding – Mixing and vibration of concrete.

UNIT – III:

Hardened Concrete: Water / Cement ratio – Abram's Law – Gel space ratio – Nature of strength of concrete –Maturity concept – Strength in tension & compression – Factors affecting strength – Relation between compression &

tensile strength – Curing, Testing of Hardened Concrete: Compression tests – Tension tests – Flexure tests –Split tension tests – Non-destructive testing methods – codal provisions for NDT.

UNIT – IV:

Elasticity, Creep & Shrinkage, Modulus of elasticity, Dynamic modulus of elasticity, Poisson's ratio, Creep of concrete, Factors influencing creep, Relation between creep & time, Nature of creep, Effects of creep – Shrinkage – types of shrinkage, Factors affecting shrinkage.

UNIT – V:

Mix Design: Factors in the choice of mix proportions – Durability of concrete – Quality Control of concrete – Statistical methods – Acceptance criteria – Concepts proportioning of concrete mixes by BIS method of mix design.

UNIT – VI:

Special Concretes: Ready mixed concrete, Shotcrete, Light weight aggregate concrete, Cellular concrete, No-fines concrete, High density concrete, Fibre reinforced concrete, Different types of fibres, Factors affecting properties of Fibre reinforced concrete, Polymer concrete, Types of Polymer concrete, Properties of polymer concrete, High performance concrete –Self consolidating concrete, SIFCON, self healing concrete.

Text Books:

1. Concrete Technology, M. S. Shetty. – S. Chand & Company
2. Concrete Technology, A. R. Santha Kumar, Oxford University Press, New Delhi

References:

1. Properties of Concrete, A. M. Neville – PEARSON – 4th edition
2. Concrete Technology, M.L. Gambhir. – Tata Mc. Graw Hill Publishers, New Delhi

Codal Provisions:

1. IS 269:1989 – Ordinary Portland Cement, grade 33
2. IS 4031:1988 – methods of physical tests for hydraulic cement.
3. IS 383:1970 – Specification for coarse and fine aggregate from natural sources for concrete.
4. IS 456:2000 Code of practice for plain and reinforced concrete.
5. IS 10262:2009 – Guideline for concrete mix proportioning.
6. SP 16:1980 Design aids for reinforced concrete to IS 456:1978

Year/Sem	IV Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	3	1	0	4	V18CET14
Name of the Course	HYDRAULIC ENGINEERING					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

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

- Solve uniform open channel flow problems
- Solve Non-uniform open channel flow problems
- Apply the principles of dimensional analysis and similitude in hydraulic model Testing
- Estimate the impact of jet on plane and curved surfaces using momentum Principle.
- Develop performance characteristics of turbines using velocity triangles
- Calculate work done and efficiency of centrifugal and reciprocating pumps

UNIT – I:

OPEN CHANNEL FLOW: Types of flows, Type of channels, Velocity distribution, energy and momentum correction factors, Chezy's, Manning's and Bazin formulae for uniform flow, Most Economical sections.

Critical flow: Specific energy-critical depth – computation of critical depth – critical, sub-critical and super critical flows.

UNIT II:

NON UNIFORM FLOW: Dynamic equation for G.V.F., Mild, Critical, Steep, horizontal and adverse slopes, surface profiles, direct step method, Rapidly varied flow, hydraulic jump, energy dissipation.

UNIT – III:

HYDRAULIC SIMILITUDE: Dimensional analysis - Rayleigh's method and Buckingham's pi theorem, study of Hydraulic models – Geometric, kinematic and dynamic similarities, dimensionless numbers, model laws, scale effect.

UNIT – IV:

MOMENTUM PRINCIPLES: Hydrodynamic force of jets on stationary and moving flat, inclined and curved vanes, jet striking centrally and at tip, velocity triangles at inlet and outlet, expressions for work done and efficiency, Angular momentum principle.

UNIT – V:

BASICS OF HYDRAULIC MACHINERY: Layout of hydropower installation, Heads and efficiencies, classification of turbines.

HYDRAULIC TURBINES: Pelton wheel, Francis turbine, Kaplan turbine - working, proportions, velocity diagram, work done and efficiency, hydraulic design, draft tube – theory and function efficiency, Governing of turbines, surge tanks, unit and specific turbines, unit speed, unit quantity, unit power, specific speed, performance characteristics, geometric similarity, cavitation.

UNIT – VI:

CENTRIFUGAL PUMPS: Pump installation details, classification, work done, manometric head, minimum starting speed, losses and efficiencies, specific

speed, multistage pumps, pumps in parallel, performance of pumps, characteristic curves, NPSH, Cavitation.

RECIPROCATING PUMPS: Introduction, classification of reciprocating pumps, main components of reciprocating pumps, working of a reciprocating pumps, discharge through pumps, indicator diagram, work done by reciprocating pumps, slip of reciprocating pumps.

TEXT BOOKS:

1. A textbook of Fluid Mechanics and Hydraulic Machines by Dr. R.K. Bansal, Laxmi Publications (P) Ltd., New Delhi, 10th Edition, 2018
2. Hydraulics and Fluid Mechanics including Hydraulic Machines by Dr. P.N. Modi and Dr. S.N. Seth, Standard Book house, Rajsons Pvt. Ltd., 21st Edition, 2017
3. A text book of Fluid mechanics and Hydraulic machines by Er. R. K. Rajput, S. Chand & company, 6th Edition, 2016

REFERENCES:

1. Flow in Open Channels by K. Subramanya, Mc Graw Hill Education, 4th Edition, 2015.
2. Fluid Mechanics and Hydraulic Machines by K. Subramanya, Mc Graw Hill Education, 1st Edition, 2010.

Year/Sem	IV Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	2	1	0	3	V18CET11
Name of the Course	SURVEYING AND GEOMATICS					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

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

- Demonstrate the basic surveying skills
- Use various surveying instruments.
- Perform different methods of surveying
- Compute various data required for various methods of surveying.
- Integrate the knowledge on surveying to the new frontiers of science like Global positioning System, Remote sensing

UNIT– I:

Introduction: Definition-Uses of surveying- overview of plane surveying (chain, Compass and plane table), Objectives, Principles and classifications – Errors in survey Measurements

UNIT – II:

Compass survey and traversing: Electronic distance measurements (EDM)-principles of electro optical EDM-Errors and corrections to linear measurements-Compass survey-Meridians, Azimuths and Bearings, declination, computation of angle. Traversing-Purpose-types of traverse-traverse computation-traverse adjustments-Introduction omitted measurements

UNIT–III:

Leveling, Contouring and Curves::Concept and Terminology, Leveling Instrument and their Temporary and permanent adjustments- method of leveling. Characteristics and Uses of contours- methods of conducting contour surveys.Types of curves, design and setting out – simple and compound curves

UNIT – IV:

Theodolite, Description, principles-uses and adjustments – temporary and permanent, measurement of horizontal and vertical angles. Principles of Electronic Theodolite – Introduction to Trigonometrically leveling,.

Tachometric Surveying: Stadia and tangential methods of Tacheometry. Distance and-Elevation formulae for Staff vertical position

UNIT–V:

Computation of Areas and Volumes: Area from field notes, computation ofareas along irregular boundaries and area consisting of regular boundaries. Embankments and cutting for a level section and two level sections with and without transverse slopes, determination of the capacity of reservoir, volume of barrow pits.

UNIT–VI: Introduction to Geo matic, Total Station and Global positioning system, Electromagnetic spectrum, Visual image interpretation, Digital image processing.

Text Books:

1. Surveying, Vol No.1, 2 &3, B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain –
2. Laxmi Publications Ltd, New Delhi,seventeenth edition (2016)
3. 2 Text book of Surveying, S.K. Duggal (Vol No. 1&2), Tata McGraw Hill Publishing
4. Co. Ltd. New Delhi.Fourth edition (1 July 2017)
5. Text book of Surveying, Arora (Vol No. 1&2), STANDARD BOOK HOUSE SINCE 1960; Edition: Year-2015 edition (2015)
6. Anji Reddy, M., Remote sensing and geographical information system,BS Publications/BSP Books (2012)

Reference Books:

1. Text book of Surveying, C. Venkataramaiah, universities Press (India) Pvt. Ltd. (12 January 2011)
2. Surveying and levelling, R. Subramanian, Oxford University Press; 2 edition (30 June 2012)

Year/Sem	IV Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	0	0	3	1.5	V18CEL03
Name of the Course	CONCRETE TECHNOLOGY LAB					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

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

- Find some properties of cement by consistency, fineness, setting times, specific gravity, soundness and compressive strength.
- Determine the workability of cement concrete by compaction factor, slump and Vee – Bee tests.
- Determine properties of self-compacting concrete by Slump cone, V funnel, L Box
- Determine the specific gravity of coarse aggregate and fine aggregate by Sieve analysis.
- Determine the flakiness and elongation index of coarse aggregates.
- Determine the bulking of sand.
- Understand the non-destructive testing procedures on concrete

I. Tests on Cement

1. Normal Consistency and fineness of cement.
2. Initial setting time and final setting time of cement.
3. Specific gravity of cement
4. Soundness of cement.
5. Compressive strength of cement.

II. Tests on Aggregate

1. Sieve Analysis and gradation chairs
2. Bulking of sand.
3. Bulk and compact densities of fine and coarse aggregates

III. Tests on Fresh Concrete

1. Slump test
2. Compact factor test
3. Vee-bee Test
4. Flow Table Test

Tests on Self Compacting Concrete

1. Slump cone
2. V funnel
3. L Box

IV. Tests on hardened concrete

1. Compression test on cubes & Cylinders
2. Flexure test
3. Splitting Tensile Test
4. Modulus of Elasticity

V. Non Destructive tests of concrete

1. Rebound hammer
2. Ultrasound pulse Velocity (UPV)

Text Books:

1. Concrete Technology, M. S. Shetty. – S. Chand & Company

References:

1. Concrete Technology, M.L. Gambhir. – Tata Mc. Graw Hill Publishers, **New Delhi.**

Codes for reference:

1. IS: 4031 – chemical analysis and tests on cement.
2. IS 650:1991 –Standards and testing
3. IS 383:1970- Specification for coarse & fine aggregate
4. IS 2386 (Part III) 1963- Methods of test for aggregate for specific gravity, density, voids, absorption & bulking
5. IS 516:1959- Specification for compressive strength, Flexural strength
6. IS 5816:1999-Method of test for splitting tensile strength of concrete.
7. IS 13311(Part 1):1992 Methods of non-destructive testing of concrete: Part 1 Ultrasonic pulse velocity.
8. IS 13311(Part 2):1992 Methods of non-destructive testing of concrete: Part 2 Rebound hammer.
9. IS 6461(Part 7):1973 Glossary of terms relating to cement concrete: Part 7 Mixing, laying, compaction, curing and other construction aspects.

Year/Sem	IV Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	0	0	3	1.5	V18CEL04
Name of the Course	SURVEYING LAB					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

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

- Use different Survey instruments to collect filed data
- Calculate distances, levels and angles from collected data
- Transfer points on ground to drawing sheet
- Interpret survey data to compute areas and volumes by using different methods
- Prepare profile of land from the collected survey data

List of experiments

1. Survey by chain survey of road profile with offsets in case of road widening.
2. Finding the area of the given boundary using compass (Closed Traverse)
3. Plane table survey; finding the area of a given boundary by the method of Radiation
4. Plane table survey; finding the area of a given boundary by the method of intersection.
5. Fly leveling : Height of the instrument method (differential leveling)
6. Fly leveling: Rise and Fall method.
7. Theodolite Survey: Determining the Horizontal and Vertical Angles by the method of repetition method.
8. Theodolite Survey: Finding the distance between two inaccessible points.
9. One Exercise on Curve setting.
10. One Exercise on contours.
11. Determination of area using total station
12. Determination distance between two inaccessible points.
13. Introduction to GPS.

Text/ References Books:

1. Surveying Vol No.1, 2 &3 by Dr.B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain –LaxmiPublications, seventeenth edition (2016), New Delhi.
2. Text book of Surveying by S.K. Duggal (Vol No. 1&2), McGraw Hill Education; Fourth edition (1 July 2017), New Delhi.
3. Text book of Surveying,Dr.K.R.Arora (Vol No. 1&2), STANDARD BOOK HOUSE SINCE 1960; Edition: Year-2015 edition (2015), Delhi.

Year/Sem	IV Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	0	0	3	1.5	V18CEL05
Name of the Course	FLUID MECHANICS AND HYDRAULIC MACHINERY LAB					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

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

- Show the verification of Bernoulli's equation
- Find the discharge through an orifice and mouth piece by using constant head and variable head methods.
- Calculate coefficient of discharge for Venturimeter and Orificemeter
- Find loss of head due to friction and minor losses in pipes
- Calculate the force exerted by the jet on the vanes.
- Calculate efficiency and sketch performance curves for turbines and pumps.

List of Experiments

1. Verification of Bernoulli's equation.
2. Calibration of Venturimeter and Orifice meter
3. Determination of Coefficient of discharge for a small orifice by a constant head method.
4. Determination of Coefficient of discharge for an external mouth piece by variable head method.
5. Characterization of laminar and turbulent flows by Reynold's apparatus.
6. Calibration of contracted Rectangular Notch and /or Triangular Notch
7. Determination of Coefficient of loss of head in a sudden contraction and friction factor.
8. Impact of jet on vanes
9. Study of Hydraulic jump.
10. Performance studies on Pelton wheel turbine
11. Performance studies on Francis turbine/Kaplan turbine.
12. Performance studies on single stage centrifugal pump.
13. Performance studies on reciprocating pump.

List of Equipment:

1. Venturimeter setup.
2. Orifice meter setup.
3. Small orifice setup.
4. External mouthpiece setup.
5. Reynold's apparatus
6. Rectangular and Triangular notch setups.
7. Friction factor test setup.
8. Bernoulli's theorem setup.
9. Impact of jets.
10. Hydraulic jump test setup.
11. Pelton wheel and Francis turbines.
12. Centrifugal and Reciprocating pumps.

TEXT BOOKS:

1. A textbook of Fluid Mechanics and Hydraulic Machines by Dr. R.K. Bansal, Laxmi Publications (P) Ltd., New Delhi, 10th Edition, 2018
2. Hydraulics and Fluid Mechanics including Hydraulic Machines by Dr. P.N. Modi and Dr. S.N. Seth, Standard Book house, Rajsons Pvt. Ltd., 21st Edition, 2017

Year/Sem	IV Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	0	0	2	1	V18CEL06
Name of the Course	ENGINEERING GEOLOGY LAB					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

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

- Understand the importance of geology in civil engineering
- Identify the geological process of any region to carry civil engineering works
- Evaluate the formation and properties of minerals, rocks and soil
- Develop the ability to prepare geological maps and sections to interpret site conditions

LIST OF EXPERIMENTS

1. Physical properties of minerals and their megascopic identification
2. Rock forming minerals: Quartz group, Feldspar group, Garnet group, Mica group, Talc, Chlorite, Olivine, Kyanite, Asbestos, Tourmelene, Calcite, Gypsum etc.
3. Ore forming minerals: Magnetite, Hematite, Pyrite, Pyralusite, Graphite, Chromite etc.
4. Megascopic description and identification of rocks
5. Igneous rocks: Granite, Pegmatite, Gabbro, Dolerite, Syenite, Granite Poryphery, Basalt, etc.
6. Sedimentary rocks: Sand stone, Ferrugineous sand stone, Lime stone, Shale, Laterite, Conglamorate, etc.
7. Metamorphic rocks: Biotite, Granite Gneiss, Slate, Muscovite & Biotiteschist, Marble, Khondalite, etc.
8. Interpretation and drawing of sections for geological maps showing tilted beds, faults, unconformities etc.
9. Simple Structural Geology problems
10. Bore hole data
11. Strength of the rock using laboratory tests
12. Field work to identify Minerals and Rocks, Geomorphology and Structural Geology

REFERENCES

1. Applied Engineering Geology Practicals by M T Maruthesha Reddy, New Age International Publishers, Second Edition, 2007.
2. Foundations of Engineering Geology by F G Bell, B S Publications, first edition, 2005.

Annexure-VII

Minutes of the meeting, BOS of Electrical and Electronics Engineering (Held on 20.04.2019)

Item No. 1: Chairperson welcomed all the BOS members.

Item No. 2: Review of course structure of III & IV semesters for UG (B.Tech-EEE) Programme of Academic Year 2019-20.

- Reviewed the course structure of III & IV semesters for UG (B.Tech-EEE) Programme for the Academic Year 2019-20 and following modifications havebeen done.

III Semester

1. Thermal and Hydro Prime Movers (THPM) Theory (Course Code:V18MET12) and Laboratory (Course Code:V18MEL06) courses are replaced with **Data Structures & Algorithms Lab (**Course Code:**V18CSL31)**.
2. Professional Ethics course (Course Code:V18ENT07) is renamed as **Professional Ethics and Human Values (**Course Code: **V18ENT12)**.
3. English BOS has renamed the titles of mandatory Courses Employability Skills-I (Course Code: V18ENT03) to Professional Communication Skills-I (Course Code:**V18ENT03**)

IV Semester

1. Power Systems – I Course (Course Code: V18EET08)**and** Power Systems – II (Course Code: V18EET10) are merged and titled as **Electrical Power Generation and Transmission (**Course Code: **V18EET10).**
2. Electrical Circuits Laboratory course (Course Code: V18EEL02) and Electrical Measurements Laboratory (Course Code: V18EEL04) are merged and titled as **Electrical Circuits & Measurements Laboratory (**Course Code: **V18EEL04).**
3. **Python Programming Laboratory (**Course Code: **V18CSL33)** is introduced.
4. Electrical Safety Awareness course(Course Code: V18EET56) title is modified as **Electrical Safety & IE Rules (**Course Code: **V18EET11).**
5. English BOS has renamed the titles of mandatory Courses Employability Skills-II (Course Code: V18ENT04) to Professional Communication Skills-II (Course Code: **V18ENT04**)

The details of the course structure for UG (B.Tech) Programme (EEE) are given in Appendix-EEE-01

Item No. 3: Propose syllabi for the courses offered in III and IV semesters of B.Tech programme of Academic Year 2019-20.

The approved syllabi for the courses offered in III and IV semesters of B.Tech programme of Academic Year 2019-20 is attached in Appendix-EEE-02

Item No. 4: Result Analysis of the courses offered in I semester.

Reviewed and apprised the results of the courses offered by EEE Department in I semester.

Results are given in Appendix-EEE-03

Appendix-EEE-01

PROPOSED COURSE STRUCTURE FOR UG-B.TECH PROGRAMME (EEE) III & IV SEMESTERS UNDER AUTONOMY

III Semester						
S.No	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**
1.	V18EET03	Electrical Circuit Analysis - I	3	1	-	4
2.	V18ECT05	Analog Electronics	3	-	-	3
3.	V18EET04	Electrical Machines – I	3	1	-	4
4.	V18EET05	Electro Magnetic Fields	3	1	-	4
5.	V18EET06	Electrical and Electronic Measurements	3	-	-	3
6.	V18CSL31	Data Structures & Algorithms Lab	-	-	6	3
7.	V18ECL03	Analog Electronics Laboratory	-	-	2	1
8.	V18ENT12	Professional Ethics & Human Values	2	-	-	MNC
9.	V18ENT03	Professional Communication Skills– I	3	-	-	MNC
		Total Contact Hours	**29**			**22**
IV Semester						
S.No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**
1.	V18EET07	Electrical Circuit Analysis -II	3	1	-	4
2.	V18EET08	Digital Electronics	3	-	-	3
3.	V18EET09	Electrical Machines – II	3	1	-	4
4.	V18MAT04	Probability &Statistics	3	1	-	4
5.	V18EET10	Electrical Power Generation and Transmission	3	-	-	3
6.	V18EEL04	Electrical Circuits & Measurements Laboratory	-	-	2	1
7.	V18EEL05	Electrical Machines Laboratory - I	-	-	2	1
8.	V18CSL33	Python Programming Lab	-	-	2	1
9.	V18EET11	Electrical Safety & IE Rules	2	-	-	MNC
10.	V18ENT04	Professional Communication Skills– II	3	-	-	MNC
		Total Contact Hours	**29**			**21**

Internship/Industrial Training – Enrolment of Internship/Industrial Training will be initiated at the end of IV Semester.

Appendix-EEE-02

SYLLABI FOR THE COURSES OFFERED FOR UG B.TECH (EEE) PROGRAMME IN III & IV SEMESTERS

Programme: B. Tech - Electrical & Electronics Engineering **Semester: III**

Course Code: V18EET03

Course Name: Electrical Circuit Analysis – I **[L : 3; T:1; P : 0 (4 credits)]**

COURSE OUTCOMES:

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

CO No.	Course Outcome	Knowledge Level
C201.1	Apply various network reduction techniques for solving electrical circuits.	K3
C201.2	Apply the principles of magnetism for solving different kind of magnetic circuits with and without dot conventions.	K3
C201.3	Calculate different parameters of single phase alternating quantities.	K3
C201.4	Determine various parameters in series and parallel resonant circuits.	K3
C201.5	Apply the network theorems for solving electrical circuits.	K3
C201.6	Calculate two-port network parameters for any type of electrical networks	K3

Unit-I: Introduction to Electrical Circuits

Classification of network elements, electric charge and current, electric energy and potential, Resistance parameter – Ohm's Law - series and parallel combination; Inductance parameter – series and parallel combination; Capacitance parameter – series and parallel combination; Energy Sources - Ideal, Non-Ideal, Independent and Dependent sources; Kirchhoff's laws; Source transformation; Y-Δ and Δ-Y transformation; Mesh analysis and Nodal analysis - problem solving for the network consisting of independent and dependent sources.

Unit-II: Magnetic Circuits

Basic definitions of MMF, Flux and Reluctance; Analogy between electrical and magnetic circuits; Analysis of series, parallel and composite magnetic circuits; Faraday's laws of electromagnetic induction; Concepts of self-inductance, mutual inductance and coefficient of coupling; Concept of Dot Convention and coupled coils.

Unit-III: Single Phase A.C Systems

Definitions of basic terms associated with periodic functions: Time period, Angular velocity and frequency, RMS value, Average value, Form factor and peak factor - numerical problems**;** Concept of phase angle and phase difference – Waveforms and phasor diagrams for lagging, leading networks; complex and polar forms of representations, steady state analysis of series and parallel combinations of R, L and C circuits; Power Factor and its significance; Concepts of Real,

Reactive, Apparent and Complex Powers; Waveforms of instantaneous voltage, current and power; Power triangle.

Unit-IV: Analysis of AC Networks & Resonance

Extension of node and mesh analysis to AC networks; Numerical problems on sinusoidal steady state analysis; Concept of Resonance - Series and parallel resonance, Bandwidth of series and parallel resonance, Quasi factor, Selectivity; Numerical problems; Introduction to locus diagrams.

Unit-V: Network Theorems (DC & AC Excitations)

Superposition, Thevenin's, Norton's, Milliman's, Reciprocity, Compensation, Maximum Power Transfer, Tellegen's theorems; problem solving for the network consisting of independent and dependent sources.Concept of Duality and Dual networks.

Unit-VI: Two-Port networks

Basic Definitions; Z-parameters; Y-parameters; Transmission line (ABCD) parameters; h-parameters; Relationship between parameter sets; Series, Parallel and Cascade connections of two port networks; problem solving for the network consisting of independent and dependent sources.

Text Books:

1. Engineering Circuit Analysis by William Hayt and Jack E.Kemmerley, McGraw Hill Company,6 th edition
2. Network Analysis by Van Valkenburg, Prentice-Hall of India Private Ltd
3. Circuit Theory (Analysis and Synthesis) by A.Chakrabarthi, DhanpatRai& Co.

Reference Books:

1. Fundamentals of Electrical Circuits by Charles K.Alexander and Mathew N.O.Sadiku, McGraw Hill Education (India)
2. Network Analysis by C.L.Wadhwa, New Age International Publishers.
3. Electric Circuits– (Schaum's outlines) by MahmoodNahvi& Joseph Edminister, Adapted byKumaRao,5th Edition – McGraw Hill.
4. Electrical Circuit Analysis by Sudhakar A. &ShyammohanS.Palli, McGraw Hill Publication
5. Introductory Circuit Analysis by Robert L Boylestad, Pearson Publications

Programme: B. Tech - Electrical & Electronics Engineering **Semester: III**

Course Code: V18EET04

Course Name: Electrical Machines – I **[L: 3; T:1; P : 0 (4 credits)]**

COURSE OUTCOMES:

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

CO No.	Course Outcome	Knowledge Level
C203.1	Understand the basic fundamentals of electromechanical energy conversion and various DC machines	K2
C203.2	Predict and mitigate the ill-effects of armature reaction and improve commutation in dc machines	K3
C203.3	Understand the torque production mechanism and control the speed of dc motors	K2
C203.4	Analyze the performance of single phase transformers	K4
C203.5	Calculate the regulation, losses and efficiency of single phase transformers	K3
C203.6	Understand the parallel transforms, control voltages with tap changing methods and achieve three phase to two phase transformation	K2

Unit-I: Introduction to DC machines

Principles of electromechanical energy conversion; Construction and principle of operation of DC machine; EMF equation of DC generator; Classification of DC machines based on excitation; Magnetization Characteristics of DC shunt generator.

Unit-II: Performance of D.C. Machines

Torque and back-emf equations of dc motor; Armature Reaction and Commutation; Characteristics of separately-excited, shunt, series and compound motors; losses and efficiency of a DC machine; Applications of DC motors

Unit-III: Starting, Speed Control and Testing of D.C. Machines

Necessity of Starter - Working of 3-Point and 4-Point Starters; Speed Control of DC shunt motor by armature voltage and field flux control; Testing of DC machines - Brake Test, Swinburne's method, Hopkinson's Test, Retardation Test; Simple Numerical Problems.

Unit-IV: Single-phase Transformers

Types, Constructional details, Principle of operation, EMF Equation of a 1-Φ Transformer; Transformer operation on No-Load and On-Load for lagging, leading and unity power factors loads and their phasor diagrams; Transformer equivalent circuit; Transformer Regulation, Losses and efficiency; effect of variation of supply frequency and voltage on losses; All day efficiency.

Unit-V: Testing of Single-phase Transformers

O.C. and S.C. tests; Sumpner's test; Separation of losses of a 1-Φ transformer; Parallel operation with equal voltage ratios; Auto Transformer - equivalent circuit, comparison with two winding transformers.

Unit-VI:-III-Phase Transformers

Poly-phase connections, Y/Y, Y/Δ, Δ/Y, Δ/Δ and open-Δ; Scott Connection; Three winding Transformer: Determination of Z_p, Z_s and Z_t; Off-load and On-load tap changers.

Text Books

1. Electrical Machines by P.S. Bhimbra, Khanna Publishers.
2. Theory & Performance of Electrical Machines by J.B.Guptha. S.K.Kataria& Sons.

Reference Books

1. Electrical Machines by D. P.Kothari, I .J .Nagarth, McGrawHill Publications, 4th edition
2. Electrical Machines by R.K.Rajput, Lakshmi publications, 5th edition.
3. Electrical Machinery by AbijithChakrabarthi and SudhiptaDebnath, McGraw Hill Education2015
4. Electrical Machinery Fundamentals by Stephen J Chapman, McGraw Hill education 2010
5. Electric Machines by MulukutlaS.Sarma & Mukeshk.Pathak, CENGAGE Learning.
6. Electric Machinery by A.E.Fitzgerald, Charles kingsley,StephenD.Umans, TMH

Programme: B. Tech - Electrical & Electronics Engineering **Semester: III**

Course Code : V18EET05

Course Name : Electro Magnetic Fields **[L : 3; T:1; P : 0 (4 credits)]**

COURSE OUTCOMES:

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

CO No.	Course Outcome	Knowledge Level
C204.1	Compute the electric field and potential due to different configurations of static charges and electric dipole.	K3
C204.2	Calculate the capacitance of various configurations and understand the concept of conduction and convection current densities.	K3
C204.3	Apply the Biot-Savart's law for finding MFI for different cables and develop the Maxwell's second equation.	K3
C204.4	Compute MFI for different cables by applying Ampere's circuital law and develop the Maxwell's third equation.	K3
C204.5	Determine the magnetic forces, torque produced by currents in magnetic fields, self-inductance of solenoid and toroid.	K3
C204.6	Calculate the induced E.M.F's and understand the concept of fileds varying with time.	K3

Unit-I: Electrostatics

Electrostatic Fields; Coulomb's Law; Electric Field Intensity (EFI) - EFI due to a line and a surface charges; Work done in moving a point charge in an electrostatic field; Electric Potential - Properties of potential function, Potential gradient; Guass's law; Maxwell's first law, div(D)=ρ_v; Laplace's and Poison's equations; Electric dipole - Potential and EFI due to an electric dipole, Torque on an Electric dipole placed in an electric field.

Unit-II: Conductors, Dielectrics and Capacitance

Conductors & Dielectrics: Conductors - Behavior of conductors in an electric field; Insulators - Polarization; Electric boundary conditions;

Capacitance: Capacitance of parallel plates, spherical and coaxial cables with composite dielectrics; Energy density in a static electric field; Current density - Conduction and Convection current densities; Ohm's law in point form, Equation of continuity.

Unit-III: Magneto Statics-I

Introduction to static magnetic fields; Biot-Savart's law; Magnetic Field Intensity (MFI) - MFI due to a straight current carrying filament, circular, square and solenoidal current carrying wires; Maxwell's second Equation, div(B)=0.

Unit-IV: Magneto Statics-II

Ampere's circuital law - MFI due to an infinite sheet of current, long filament current carrying conductor, circular, rectangular and square loops; Point form of Ampere's circuital law; Maxwell's third equation, Curl (H)=J.

Unit-V: Forces in Magnetic fields and Inductance

Magnetic force; Behavior of charges moving in magnetic field; Lorentz force equation; Force on a current carrying element placed in a magnetic field; Force on a straight and a long current carrying conductor placed in a magnetic field; Force between two straight long and parallel current carrying conductors; Magnetic dipole - a differential current loop as a magnetic dipole, Torque on a current loop placed in a magnetic field; Inductance: Basic expressions for self and mutual inductances, self-inductance of a solenoid and toroid.

Unit-VI: Time Varying Fields

Introduction; Integral and point forms of faraday's laws of electromagnetic induction; statically and dynamically induced EMFs; Maxwell's fourth equation, Curl (E) = $-\partial B/\partial t$; Modification of Maxwell's equations for time varying fields; Simple problems.

Text Books

1. Engineering Electromagnetics by William H. Hayt& John. A. Buck Mc. Graw-Hill Companies, 7th Editon.2006.
2. Electromagnetic Fields by R MeenaKumari, R Subhasri, New Age International, 2008.
3. Elements of Electromagnetics by Matthew N.O. Sadiku, Oxford University Press, 4th edition.

Reference Books

1. Introduction to Electro Dynamics by D J Griffiths, Prentice-Hall of India Pvt. Ltd, 2nd edition
2. Electromagnetic Field Theory by Yaduvir Singh, Pearson.
3. Fundamentals of Engineering Electromagnetics by Sunil Bhooshan, Oxford higher education.

Programme: B. Tech - Electrical & Electronics Engineering **Semester: III**

Course Code: V18EET06

Course Name: Electrical and Electronic Measurements

[L : 3; T:1; P : 0 (4 credits)]

COURSE OUTCOMES:

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

CO No.	Course Outcome	Knowledge Level
C205.1	Identify the proper instrument for measurement of AC or DC voltage and current	K2
C205.2	Choose thesuitable instrument for the measurement of power and energy.	K3
C205.3	Understand the operation of potentiometer.	K2
C205.4	Compute the electrical parameters by using appropriate bridge.	K3
C205.5	Calculate different magnetic parameters by using magnetic instruments and illustrate the instrument transformers.	K3
C205.6	Understand the operation of various digital instruments.	K2

Unit-I: Electromechanical Indicating Instruments

Classification of measuring instruments; Construction and principle of operation of PMMC Galvanometer, MI instruments; Extension of instrument ranges using shunts, multipliers; Numerical Problems.

Unit-II: Power and Energy Measurement

Single phase dynamometer wattmeter (LPF and UPF), expression for deflecting and control torques; Type of P.F. Meters; Single phase induction type energy meter, Driving and braking torques, errors and compensations, testing by phantom loading using R.S.S. meter; Numerical Problems.

Unit-III: Potentiometers

Principle and operation of D.C. Crompton's potentiometer and their applications; Types of AC Potentiometers and their Applications.

Unit-IV: Measurement of Parameters

I. Measurement of Resistance: wheat stone's bridge and its Sensitivity; Ohm meter; Kelvin's double bridge; Loss of charge method; Earth resistance measurement by fall of potential method and megger.
II. Measurement of inductance & Q-Factor: Maxwell's bridge; Hay's bridge; Anderson's bridge.
III. Measurement of capacitance and loss angle: Desauty's Bridge; Schering Bridge.

Unit-V: Magnetic Measurements & Instrument Transformers

Magnetic Measurements: Constructional details of Flux meter; Determination of B–H Loop: Methods of reversals and Step-by-Step method; Core loss measurements by Maxwell's and Campbell's Bridges.

Instrument Transformers: Ratio and Phase angle errors (Derivation & Phasor Diagram) and their applications in the extension of instrument ranges.

Unit-VI: Electronic Instruments

Introduction; Digital Voltmeters (DVM); Ramp type DVM; Integrating type DVM; Successive-approximation DVM; Digital frequency meter, Digital Tachometer; Measurement of phase difference & Frequency by using lissajous patterns in CRO; Electronic Multi meter.

Text Books:

1. A course in Electrical& Electronic Measurement and Instrumentation by A.K.Sawhney, DhapatRai& Co.
2. Electronic Instruments by H.S. Kalsi, Tata Mc-Graw hill.

Reference Books:

1. Electrical and Electronic Measurements and instrumentation by R.K.Rajput, S.Chand.
2. Digital Instrumentation by A.J. Bouwens, Tata Mc-Graw hill.
3. Modern Electronic instrumentation & Measuring instruments by A.D. Heltric& W.C. Copper, Wheeler Publication.
4. Instrument transducers by H.K.P. Neubert, Oxford University press.
5. Electrical Measurements by Forest K. Harris, John Wiley and Sons.

Programme: B. Tech - Electrical & Electronics Engineering **Semester: IV**

Course Code: V18EET07

Course Name: Electrical Circuit Analysis –II **[L : 3; T:1; P : 0 (4 credits)]**

COURSE OUTCOMES:

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

CO No.	Course Outcome	Knowledge Level
C210.1	Compute electrical parameters for 3-phase balanced systems	K3
C210.2	Determine electrical parameters for 3-phase unbalanced systems	K3
C210.3	Analyse circuit parameters under transient conditions	K3
C210.4	Apply Foster and Cauer methods for Network Synthesis	K3
C210.5	Apply Fourier Series and Transforms for analysing electrical circuits	K3
C210.6	Understand the concept of filters	K3

Unit-I: Balanced Three phase circuits

Advantages of three phase over single phase system; Generation of three phase voltages; Inter connection of three phase windings: Star and delta connection, Phase sequence, Relation between line and phase voltages and currents in balanced systems; Balanced Star connected load supplied from: Balanced 3-phase 4-wire system, balanced 3-phase 3-wire system; Balanced delta connected load supplied from: Balanced 3-phase 3-wire system, measurement of active and reactive power in balanced 3-phase systems.

Unit-II: Unbalanced Three phase circuits

Unbalanced Star connected load supplied from: Balanced 3-phase 4-wire system, balanced 3-phase 3-wire system; Unbalanced delta connected load supplied from: Balanced 3-phase 3-wire system; Analysis of 3-phase unbalanced circuits: Loop method, Star-Delta transformation technique; Measurement of three phase power using two wattmeter method.

Unit-III: Transient analysis in DC and AC Circuits

Initial Conditions; Analysis of R-L, R-C and R-L-C circuits with DC and AC excitations using differential equations and Laplace transforms; Numerical Problems.

Unit-IV: Network Synthesis

Concept of Stability; Hurwitz Polynomials: Properties, Procedure of Testing; Positive real function; Basic synthesis procedure; LC immittance functions; RC impedance and RL admittance functions; RL impedance and RC admittance functions by using Foster and Cauer methods.

Unit-V: Fourier Analysis and Transforms

Fourier Theorem; Trigonometric form and exponential form of Fourier series; Conditions of symmetry; Line spectra and phase angle spectra; Analysis of electrical circuits to non- sinusoidal periodic waveforms.

Fourier integrals and Fourier transforms: Properties of Fourier transforms and application to electrical circuits.

Unit-VI: Passive Filters and Attenuators

Classification and general relations in filters, Constant K low pass, high pass and band pass filters, m-derived low pass, high pass and band pass filters, Attenuators symmetrical and asymmetrical.

Text Books:

1. Engineering Circuit Analysis by William Hayt and Jack E.Kemmerley, McGraw Hill Company,6th edition
2. Network Analysis byVan Valkenburg, Prentice-Hall of India Private Ltd
3. Circuit Theory (Analysis and Synthesis) by A.Chakrabarthi, DhanpatRai& Co.

Reference Books:

1. Network Theory by N.C. Jagan, C. Lakshminarayana, Anshan Publications
2. Network Theory-Analysis and Synthesis by SmarajitGhosh, PHI Publishers
3. Fundamentals of Electrical Circuits by Charles K.Alexander and Mathew N.O.Sadiku, McGraw Hill Education (India)
4. Network Analysis by C.L.Wadhwa, New Age International Publishers.
5. Electric Circuits– (Schaum's outlines) by MahmoodNahvi& Joseph Edminister, Adapted byKumaRao, 5th Edition – McGraw Hill.
6. Electrical Circuit Analysis by Sudhakar A. &ShyammohanS.Palli, McGraw Hill Publication
7. Introductory Circuit Analysis by Robert L Boylestad, Pearson Publications

Programme: B. Tech - Electrical & Electronics Engineering **Semester: IV**

Course Code: V18EET08

Course Name: Digital Electronics **[L : 3; T:1; P : 0 (4 credits)]**

COURSE OUTCOMES:

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

CO No.	Course Outcome	Knowledge Level
C211.1	Understand various number systems, conversation from one radix to another radix.	K2
C211.2	Solve the boolean functions using K-map and tabular minimization	K3
C211.3	Construct the combinational logic circuits	K3
C211.4	Apply PLD's for realization of Boolean	K3
C211.5	Develop the sequential logic circuits such as flip flops, counters and registers.	K3
C211.6	Analyse clocked sequential circuits, finite state machines, Meelay to Moore conversion and vice-versa.	K4

Unit-I: Review of Number Systems & Codes:

i) Representation of numbers of different radix, conversation from one radix to another radix, r-1's compliments and r's compliments of signed members, problem solving.

ii) 4 bit codes, BCD, Excess-3, 2421, 84-2-1 9's compliment code etc.,

iii) Logic operations and error detection & correction codes; Basic logic operations - NOT, OR, AND, Universal building blocks, EX-OR, EX-NOR - Gates, Standard SOP and POS, Forms, Gray code, error detection, error correction codes (parity checking, even parity, odd parity, Hamming code) NAND-NAND and NOR-NOR realizations.

Unit-II: Minimization Techniques:

Boolean theorems, principle of complementation & duality, De-morgan theorems, minimization of logic functions using Boolean theorems, minimization of switching functions using K-Map up to 6 variables, tabular minimization, problem solving (code converters using K-Map etc..).

Unit-III: Combinational Logic Circuits Design:

Design of Half adder, full adder, half subtractor, full subtractor, applications of full adders, 4-bit binary subtractor, adder-subtractor circuit, BCD adder circuit, Excess 3 adder circuit, look-a-head adder circuit, Design of decoder, demultiplexer, 7 segment decoder, higher order demultiplexing, encoder, multiplexer, higher order multiplexing, realization of Boolean functions using decoders and multiplexers, priority encoder, 4-bit digital comparator.

Unit-IV: Introduction of PLD'S:

PROM, PAL, PLA-Basics structures, realization of Boolean function with PLDs, merits & demerits of PROM, PAL, PLA comparison, realization of Boolean functions using PROM, PAL, PLA, programming tables of PROM, PAL, PLA.

Unit-V: Sequential Circuits I:

Classification of sequential circuits (synchronous and asynchronous); basic flip-flops, truth tables and excitation tables (nand RS latch, nor RS latch, RS flip-flop, JK flip-flop, T flip-flop, D flip-flop with reset and clear terminals). Conversion from one flip-flop to flip-flop. Design of ripple counters, design of synchronous counters, Johnson counter, ring counter. Design of registers - Buffer register, control buffer register, shift register, bi-directional shift register, universal shift register.

Unit-VI: Sequential Circuits II:

Finite state machine; Analysis of clocked sequential circuits, state diagrams, state tables, reduction of state tables and state assignment, design procedures.Realization of circuits using various flip-flops.Meelay to Moore conversion and vice-versa.

Text Books:

1. Digital Design – Morris Mano, PHI, 4th Edition, 2008.
2. Switching & Finite Automata theory – ZviKohavi, TMH, 3rd Edition, 2011.

Reference Books:

1. Introduction to Switching Theory and Logic Design by Frederick J. Hill , Gerald R., PetersonMc-Graw Hill TMH edition.
2. Switching Theory and Logic Design by A. Anand Kumar, PHI, 3rd Edition.
3. Fundamentals of Logic Design by Charles H. Roth Jr, Jaico Publishers.
4. Microelectronics by Milliman, MH edition.

Programme: B. Tech - Electrical & Electronics Engineering Semester: IV
Course Code: V18EET09
Course Name: Electrical Machines – II **[L : 3; T:1; P : 0 (4 credits)]**

COURSE OUTCOMES:

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

CO No.	Course Outcome	Knowledge Level
C212.1	Explain the operation and performance of three phase induction motor	K3
C212.2	Analyze the torque-speed relation, performance of induction motor andinduction generator	K4
C212.3	Explain the torque production mechanism and starting of single phase induction motors	K3
C212.4	Analyze the performance of synchronous generators by determining its voltage regulation.	K4
C212.5	Examinethe parallel operation and control of real and reactive powers for synchronousgenerators.	K3
C212.6	Understand the operation, performance, starting and power factor corrections of synchronousmotors and Mathematical Analysis of power developed, hunting and its suppression	K4

Unit-I: 3-phase Induction Motors

Construction details of cage and wound rotor machines; Production of rotating magnetic field; Principle of operation; Rotor EMF, Rotor frequency, Rotor Current and p.f. at standstill and during running conditions; Rotor power input; rotor copper losses; Mechanical power developed and their interrelationship; Equivalent circuit; Phasor diagram.

Unit-II: Characteristics, starting and testing methods of Induction Motors

Torque equation; expressions for maximum torque and starting torque; torque-slip characteristics; double cage and deep bar rotors construction; crawling and cogging; speed control of induction motor with V/f method; no-load and blocked rotor tests (construction of circle diagram for predetermination of performance parameters); methods of starting, soft starters; induction generator operation (Qualitative treatment only).

Unit-III: Single Phase Motors

Constructional features and its equivalent circuit; Problem of starting – Double revolving field theory; Starting methods; shaded pole motors; AC Series motor.

Unit-IV: Alternators

Constructional features of non–salient and salient pole type alternator; Armature windings – Distributed and concentrated windings; Distribution, Pitch and Winding factors; E.M.F equation; Improvements of waveform and armature reaction; Voltage regulation by synchronous impedance method, MMF method and Potier triangle method; Phasor diagrams; Two reaction analysis of salient pole machine and phasor diagram.

Unit-V: Parallel Operation of Alternators

Parallel operation with infinite bus and other alternators; Synchronizing power; Load sharing; Control of real and reactive powers; Numerical problems.

Unit-VI: Synchronous Motors

Principle and theory of operation of Synchronous Motor;Phasor diagram; Starting torque; Variation of current and power factor with excitation; Synchronous condenser; Mathematical Analysis for power developed; Hunting and its suppression; Methods of starting.

Text Books

1. Electrical Machines by P.S. Bhimbra, Khanna Publishers
2. Theory & Performance of Electrical Machines by J.B.Guptha. S.K.Kataria& Sons

Reference Books

1. Electrical Machines by D. P.Kothari, I .J .Nagarth,McGrawHill Publications, 4th edition
2. Electrical Machines by R.K.Rajput, Lakshmi publications, 5th edition.
3. Electrical Machinery by AbijithChakrabarthi and SudhiptaDebnath,McGraw Hill education 2015
4. Electrical Machinery Fundamentals by Stephen J Chapman McGraw Hill education 2010
5. Electric Machines by MulukutlaS.Sarma&Mukeshk.Pathak, CENGAGE Learning.
6. Electric Machinery by A.E.Fitzgerald, Charleskingsley,StephenD.Umans, TMH

Programme: B. Tech - Electrical & Electronics Engineering **Semester: IV**
Course Code: V18EET10
Course Name: Electrical Power Generation & Transmission
[L:3; T:1; P:0 (4 credits)]

COURSE OUTCOMES:
After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
C214.1	Understand the working of conventional power generating stations	K2
C214.2	Choose the proper turbine for a particular power generating station	K3
C214.3	Calculate the performances parameters of various load and insulation resistance and power factor of the cables.	K3
C214.4	Compute the resistance, inductance and capacitance of transmission lines	K3
C214.5	Determine the various transmission line parameters	K3
C214.6	Understand different effects occurred and calculate the corona loss, sag and tension in transmission lines	K3

Unit-I: Conventional Power generating Stations
General layout of a thermal power plant and its Components-General layout of Nuclear power plant -Nuclear fission and Chain Reaction –General Lay out of Hydel power plant and Description of its main components

Unit-II: Turbines
Steam Turbines: Schematic layout of steam power plant, Classification of Steam Turbines-Impulse Turbine and Reaction Turbine- Compounding in Turbines-Velocity Diagrams for simple Impulse and Reaction Turbines- Work done & efficiency

Unit-III: Economic Aspects of Power Generation, Tariffs and Cables
Load curve, load duration and integrated load duration curves, discussion on economic aspects: connected load, maximum demand, and demand factor. Different Tariff methods.
Construction of cables, Types of Cables, Calculation of insulation resistance and power factor of the cable.

Unit-IV: Transmission Line Parameters
Conductor materials: Types of conductors – Calculation of resistance for solid conductors – Calculation of inductance for single phase– Single and double circuit lines–Concept of GMR and GMD–Symmetrical and asymmetrical conductor configuration with and without transposition–Bundled conductors-Numerical Problems–Calculation of capacitance for 2 wire– Effect of ground on capacitance – Capacitance calculations for symmetrical and asymmetrical for single phase–Numerical Problems

Unit-V: Modeling of Transmission Lines

Classification of Transmission Lines: Short, medium and their model representations –Nominal-T–Nominal-Pie and A, B, C, D Constants for symmetrical and Asymmetrical Networks— Evaluation of A,B,C,D Constants–, regulation and efficiency-Numerical problems-Surge Impedance –Surge Impedance loading-Wavelengths and Velocity of Propagation.

Unit-VI: Sag and Tension Calculations and Overhead Line Insulators

Skin and Proximity effects – Ferranti effect – Charging Current –Shunt Compensation –Corona – Description of the phenomenon–Factors affecting corona- Sag and Tension calculations with equal and unequal heights of towers– Effect of Wind and Ice on weight of Conductor–Numerical Problems

Text Books

1. Generation, Distribution and Utilization of Electric Energy by C.L.Wadhawa, New age International (P) Limited, Publishers
2. Thermal Engineering by Rajput, Lakshmi publications
3. Electrical Power Systems by C.L.Wadhwa, 6th Edition, New Age International Publishers.

Reference Books

1. Text Book on Power System Engineering by M.L.Soni, P.V.Gupta, U.S.Bhatnagar and Chakrabarti, DhanpatRai& Co. Pvt. Ltd
2. A Course in Power Systems by J. B. Gupta, S K Kataria& Sons Publishers.
3. Principles of Power Systems by V.K Mehta and Rohit Mehta, S. Chand Publishers.
4. Electrical Power Systems by P.S.R. Murthy, B.S.Publications.

Programme:B. Tech - Electrical & Electronics Engineering **Semester: IV**
Course Code:V18EEL04
Course Name: Electrical Circuits & Measurements Laboratory
[L:0;T:0;P:2(1credits)]

COURSE OUTCOMES:
After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
C215.1	Compute response in the electrical circuits using various Network theorems and determine two port network parameters	K3
C215.2	Sketch Locus Diagrams of RL and RC Series Circuits	K3
C215.3	Find parameters of the circuit under resonance conditions	K3
C215.4	Analyse the measuring parameters of Anderson & Schering bridge.	K3
C215.5	Calibrate voltmeters, ammeters, single phase energy meters	K3
C215.6	Apply various methods to calculate 3phase power and choke coil parameters	K3

Any 5 experiments from each cycle are to be conducted

Cycle I:

1. Verification of Thevenin's and Norton's Theorems
2. Verification of Superposition and Reciprocity Theorem
3. Verification of Compensation and Millmann's Theorems.
4. Verification of Maximum Power Transfer Theorem.
5. Locus Diagrams of RL and RC Series Circuits.
6. Time Response of first order RC and second order RLC Networks.
7. Series and Parallel Resonance
8. Determination of Z, Y, Transmission and hybrid parameters.

Cycle II:

1. Calibration and Testing of single phase energy Meter
2. Calibration of PMMC ammeter and voltmeter using Crompton D.C. Potentiometer
3. Calibration of AC voltmeter and measurement of choke parameters using AC Potentiometer in polar form.
4. Calibration of dynamometer and LPF wattmeter by using phantom and direct loading.
5. Capacitance and Inductance Measurement using Schering Bridge and Anderson bridge.
6. Measurement of 3 phase power with single watt meter and using two C.Ts
7. Measurement of choke coil Parameters by using 3 Voltmeter and 3 Ammeter method.

Programme: B. Tech - Electrical & Electronics Engineering Semester: IV
Course Code: V18EEL05
Course Name: Electrical Machines Laboratory – I

[L :0; T:0; P : 2 (1 credits)]

COURSE OUTCOMES:
After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
C216.1	Apply and Deduce the principles of Electrical Machines through laboratory experimental work	K3
C216.2	Connect the circuit to perform experiments and measure the required parameters	K3
C216.3	Analyse the observed data & come to a conclusion	
C216.4	Organize reports based on performed experiments with effective demonstration of diagrams and characteristics /graph	K4
C216.5	Demonstrate the performance of Electrical Machines.	K4
C216.6	Troubleshoot the operation of Electrical machines.	K3

Any 10 of the following experiments are to be conducted

1. Magnetization characteristics of DC shunt generator: Determination of critical field resistance and critical speed.
2. Brake test on DC shunt motor. Determination of performance curves.
3. Hopkinson's test on DC shunt machines. Predetermination of efficiency.
4. Swinburne's test and Predetermination of efficiencies as Generator and Motor.
5. Speed control of DC shunt motor by Field and armature Control.
6. Retardation test on DC shunt motor. Determination of losses at rated speed.
7. Separation of losses in DC shunts motor.
8. OC & SC test on single phase transformer.
9. Sumner's test on single phase transformers.
10. Scott connection of transformers.
11. Parallel operation of Single phase Transformers.
12. Separation of core losses of a single phase transformer.
13. Heat run test on a bank of 3 Nos. of single phase Delta connected transformers.

Programme B. Tech - Electrical & Electronics Engineering Semester: IV
Course Code: V18EET56
Course Name: Electrical Safety & IE Rules **[L : 2; T:0; P : 0 (MNC)]**

COURSE OUTCOMES:

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

CO No.	Course Outcome	Knowledge Level
C218.1	Understand the types of electrical hazards and its impact on human body	K2
C218.2	Identify various electrical safety equipment required in power industries.	K2
C218.3	Explain different types of safety methods needed for safe operation of power system	K2
C218.4	Demonstrate the electrical accident rescue techniques and required first aid	K3
C218.5	Understand the departmental procedure for obtaining service connection	K2
C218.6	Describe various IE rules in Indian Electricity Act	K2

Unit-I: Hazards of Electricity

Introduction, Hazard Analysis, Shock, Arc, Blast, Affected Body Parts, Summary Of Causes—Injury And Death, Protective Strategies.

Unit-II: Electrical Safety Equipment

Introduction, General Inspection and Testing Requirements for Electrical Safety Equipment, Flash And Thermal Protection, Head and Eye Protection, Rubber Insulating Equipment, Hot Sticks, Insulated Tools, Barriers And SignsSafety Tags, Locks, and Locking Devices , The Electrician's Safety Kit

Unit-III: Safety Procedures and Methods

Introduction, The Six-Step Safety Method, Job Briefings, Energized Or De-Energized?, Safe Switching Of Power Systems, Energy Control Programs, Lockout-Tagout, Placement Of Safety Grounds, Barriers And Warning Signs, Tools And Test Equipment, The One-Minute Safety Audit.

Unit-IV: Accident Prevention, Rescue, and First Aid

Accident Prevention, Individual Responsibility, Installation Safety, First Aid ,Resuscitation (Artificial Respiration), Heart-Lung Resuscitation, Rescue Techniques, General Rescue Procedures, Accident Investigation

Unit-V: Departmental Procedures and Tests

Departmental procedure for obtaining service connection, Insulation resistance and Earth resistance, testing of electrical installation, Insulation resistance between conductor and earth, load survey.

Unit-VI: REC and Indian Electricity Act

Introduction, Rural Electrification, Indian Electricity Rules, National Electrical Code.

Textbooks:

1. Electrical Saftey hand book byJohn Cadick, Mary Capelli-Schellpfeffer, Dennis K. Neitzel, 3rd edition, McGraw-Hill Publications.

References:

1. Indian Electricity Act 2003
2. The Indian Electricity Rules, 1956

3. A Study Guide on Electrical SafetyHazards Awareness by EFCOG Electrical Safety Improvement Project.

Appendix-EEE-03

Course Name: Basic Electrical and Electronics Engineering
Course Code: V18EET01

Branch	Name of the Faculty	No. of Students			Pass %	No. of Students Secured						failed only in this Course	Pass %(If single Course failures Could be avoided	Grade Point		
		Appeared	Passed	Failed		Grade	'A' Grade >=80 to <90	Grade >=70 to <80	'C' Grade >=60 to <70	'D' Grade >=50 to <60	'E' Grade >=40 to <50			MIN	MAX	AVG
ME-A	K.Suresh	42	24	18	57.14	0	1	5	5	3	10	3	64.29	5	9	6.33
ME-B		38	32	6	84.21	0	4	7	6	10	5	4	94.74	5	9	6.84
CSE-A	G.MadhuSagarBabu	58	29	29	50	0	2	2	3	11	11	10	67.24	5	9	6.07
CSE-B		60	60	0	100	0	8	17	19	10	6	0	100	5	9	7.18
CSE-C	A. U. S. Naga Prasad	59	55	4	93.22	2	13	7	24	8	1	2	96.61	5	10	7.53
CSE-D		60	60	0	100	5	11	19	13	8	4	0	100	5	10	7.67

Annexure-VIII

Minutes of the meeting, BOS of Computer Science Engineering (Held on 20.04.2019)

Item No. 1: Introducing members of BOS by Chairperson.

The Chairperson BOS extended a formal welcome and introduced the members.

Item No. 2: Review of the syllabus approved for the Academic Year 2018-19(B.Tech)

(i) As per the discussions by the BOS members, no changes were suggested in the Syllabus.

Item No: 3: Suggest modification for the existing Course Structure (B.Tech).

i) The courses namely **Employability Skills-I (V18ENT03) and Employability Skills-II (V18ENT04)** were renamed by BOS of English as **Professional Communication Skills – I (V18ENT03) and Professional Communication Skills –II (V18ENT04)**.

ii) A new **MNC course** by name **Technical Skills-I (**V18CST60**) & Technical Skills-II (**V18CST61**)** were suggested by the committee to be offered in the III Sem & IV Sem respectively.

iii) The Course Structure & Syllabus for these four courses are placed in **Appendix-CSE-01.**

Item No: 4: Change of course (II SEM) in the Approved course structure (M.Tech)

To provide advanced courses the committee recommended **Deep Learning (V18CTT19)** Course in place of **Artificial Intelligence (V18CTT12)** in Elective-I. The revised Course Structure is proposed in **Appendix-CSE-02**.

Item No.5: Syllabi for the proposed courses offered in III and IV semesters of B.Tech Programme for the Academic Year 2019-20 & M.Tech(CSE) II Sem.

(i) The proposed Syllabi is given in **Appendix-CSE-03**.

(ii) Syllabus is approved for the courses offered to EEE & ECE Programmes, is given in **Appendix-CSE-04.**

S.No.	Programme	SEM	Course Code	Course Name
1	EEE	III	V18CSL31	Data Structures & Algorithms Lab
2	EEE	IV	V18CSL33	Python Programming Lab
3	ECE	IV	V18CSL32	Object-OrientedProgrammingThrough Java Lab

iii) **M.Tech , Deep Learning (V18CTT19)** Course Syllabus is proposed in **Appendix-CSE-05.**

Item No.6: Any other item with the permission of chair

We are awaiting for the approval of new Programme Computer Science & Technology (CST) for the A.Y 2019-20. As suggested by the BOS, it has been decided to adopt the

same Syllabi & Course Structure of I & II SEM CSE for CST also. Details are given in **Appendix CSE-06**

Appendix-CSE-01

B.Tech Course Structure

S.No	III – Semester						
	Course Code		**Course**	**L**	**T**	**P**	**C**
1	V18MAT04	BSC	Probability & Statistics	3	1	0	4
2	V18ECT06	ESC	Digital Electronics	3	0	0	3
3	V18CST02	PCC	Data Structures and Algorithms	3	0	0	3
4	V18CST03	ESC	Discrete Mathematics	3	0	0	3
5	V18CST04	ESC	Object Oriented Programming for problem Solving	3	0	0	3
6	V18ECL04	ESC	Digital Electronics Lab	0	0	2	1
7	V18CSL02	PCC	Data Structures and Algorithms Lab	0	0	3	1.5
8	V18CSL03	ESC	Object Oriented Programming for problem Solving Lab	0	0	3	1.5
9	V18ENT03		Professional Communication Skills – I	3	0	0	MNC
10	V18CST60		**Technical Skills-I**	0	0	4	MNC
Total				**18**	**1**	**12**	**20**

Total Contact Hours: 31

IV – Semester							
S.No	**Course Code**		**Course**	**L**	**T**	**P**	**C**
1	V18CST05	PCC	Computer Organization	3	0	0	3
2	V18CST06	PCC	Software Engineering	3	0	0	3
3	V18CST07	PCC	Formal Languages and Automata Theory	3	0	0	3
4	V18CST08	PCC	Java Programming	3	0	0	3
	V18CST09	PCC	Python Programming	3	0	0	3
5	V18MBET51	HSS	Managerial Economics and Financial Analysis	3	0	0	3
6	V18CSL04	PCC	Java Programming Lab	0	0	3	1.5
7	V18CSL05	PCC	Python Programming Lab	0	0	3	1.5
8	V18ENT11		Constitution of India	2	0	0	MNC
9	V18ENT04		Professional Communication Skills – II	3	0	0	MNC
10	V18CST61		**Technical Skills -II**	0	0	4	MNC
Total				**23**	**0**	**10**	**21**

Total Contact Hours: 33

Appendix-CSE-02

M.Tech (CSE) Course Structure

I-SEMESTER

S.No.	Course Code	Course	L	T	P	C
1	V18CTT01	Object Oriented Software Engineering	3	-	-	3
2	V18CTT02	NOSQL Database	3	-	-	3
3	V18CTT03	Advanced Computer Architecture	3	-	-	3
4	V18CTT04	Advanced Operating Systems	3	-	-	3
5	V18CTT05	Advanced Data Structures and Algorithm Analysis	3	-	-	3
6	V18CTT06	Machine Leaning	3	-	-	3
7	V18CTL01	NOSQL Database Lab	-	-	2	1
8	V18CTL02	Advanced Data Structures and Algorithm Analysis Lab	-	-	2	1
9	V18CTT41	Seminar-I	-	2	-	2
Total Credits			**18**	**2**	**4**	**22**

L = Lecture, T = Tutorial, P = Practical & C = Credits

Total Contact Hours: 24

II-SEMESTER

S.No.	Course Code	Course	L	T	P	C
1	V18CTT07	Data Science	3	-	-	3
2	V18CTT08	Advanced Web Technologies	3	-	-	3
3	V18CTT09	Cloud Computing	3	-	-	3
4	V18CTT10	Internet of Things	3	-	-	3
5	**Elective-I**		3	-	-	3
	V18CTT11	1) Cyber Security				
	V18CTT19	2) Deep Learning				
	V18CTT13	3) Bioinformatics				
	V18CTT14	4) Wireless Sensor Networks				
6	**Elective-II**		3	-	-	3
	V18CTT15	1) Image Processing				
	V18CTT16	2) Parallel Algorithms				
	V18CTT17	3) Mobile Computing				
	V18CTT18	4) Grid Computing				
7	V18CTL03	Data Science Lab	-	-	2	1
8	V18CTL04	Advanced Web Technologies Lab	-	-	2	1
9	V18CTT42	Seminar-II	-	2	-	2
Total Credits			**18**	**2**	**4**	**22**

L = Lecture, T = Tutorial, P = Practical & C = Credits

Total Contact Hours: **24**

Appendix-CSE-03

III Sem	**PROBABILITY AND STATISTICS**	Course Code: VI8MAT04	L	T	P
			3	1	0

COURSE OUTCOMES:

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

CO1: Find measures of central tendency and dispersion for real data sets.

CO2: Find parameters of given function

CO3: Apply probability distribution to real time problems

CO4: Plot a best fit curve to an experimental data and find the correlation and regression

CO5: Create good estimators to various parameters

CO6: Apply the principles of Statistical Inference to practical problems

Unit-I: Basic Statistics

Measures of Central Tendency: Mean, Median, Mode

Measures of Dispersion: Variance, Standard deviation, Skewness and Kurtosis

Unit-II: Basic Probability

Random Variables: Discrete and continuous - Probability function – density and distribution function, Expectation of a Random Variable, Moments, Chebychev's Inequality (Without proof).

Unit-III: Probability Distributions

Probability distributions: Binomial, Poisson and Normal - Evaluation of statistical parameters: Mean, Variance and their properties, Introduction to Exponential, Gamma and Weibull distributions.

Unit-IV: Bivariate Distributions

Curve fitting by the method of Least squares- Fitting of straight line, parabola and exponential curves, Simple Correlation and Regression – Rank correlation.

Unit-V: Sampling Distribution and Estimation

Introduction **–**Sampling distribution of means with known and unknown standard deviation

Estimation: Criteria of a good estimator, point and interval estimators for means and proportions

Unit-VI: Tests of Hypothesis

Introduction-Type-I, Type-II Errors, Maximum Error, one–tail, two-tail tests,Test of significance: Large sample test for single proportion, difference of proportions, single mean, difference of means.

Test of significance: Small sample test for single mean, difference of means and test of ratio of variances (F-Test) - Chi-square test for goodness of fit and independence of attributes.

Text Books:

1. **B. V. Ramana**, A text Book of Engineering Mathematics, Tata McGraw Hill.

2. **Miller & Freund's**, Probability & Statistics for Engineers – Eighth Edition,Richard. A. Johnson

References Books:

1. **S. Ross,** "A First Course in Probability", Pearson Education India, 2002.
2. **Dr.T.S.R.Murthy**, Probability and Statistics for Engineers, BS Publications.
3. **T. Veerarajan**, "Engineering Mathematics", Tata McGraw-Hill, New Delhi, 2010.

III Sem	DIGITAL ELECTRONICS	Course Code: VI8ECT06	L	T	P
			3	0	0

COURSE OUTCOMES:

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

CO1: Illustrate the conversion of a number from one number system to another .

CO2: Classify Boolean theorems & simplify the Boolean functions using the Boolean properties.

CO3: Use K-map as a tool to simplify and design logic circuits

CO4: Construct different combinational Logic circuits like MUX, Decoders, Encoders etc.

CO5: Demonstrate the basic flip-flops in terms of truth table & excitation table

CO6: Apply the concepts of flip-flops in the designing of different sequential circuits like registers, counters, etc.

UNIT I: Number systems & Binary codes:

Number systems: Number Systems, Radix conversions, complement of numbers. Binary codes: Binary codes, Weighted and non-Weighted codes, BCD code, gray code, excess 3 codes.

UNIT -II: Concept of Boolean algebra:

Basic Theorems and Properties of Boolean algebra, Boolean Functions, Canonical and Standard Forms, Minterms and Maxterms, Logic gates: NOT, OR, AND, NOR, NAND, XOR, XNOR - Universal gates.

UNIT- III: Gate level Minimization:

Map Method, Two-Variable K-Map, Three-Variable K-Map, Four Variable K-Maps. Products of Sum Simplification, Sum of Products Simplification, Don't – Care Conditions, NAND and NOR Implementation.

UNIT- IV: Combinational Logic:

Introduction, Analysis Procedure, Design Procedure, Binary Adder–Subtractor, Decimal Adder, Decoders, Encoders, Multiplexers.

UNIT V: **Sequential Logic Circuits**:

Introduction –Latches and Flip flops: Basic Flip flop circuit, RS, D, JK and T Flip-flops – Triggering of Flip flops: Master Slave Flip flop, edge triggered flip flop – Conversion of one type of Flip flop to another.

UNIT -VI: Registers and Counters:

Registers and Counters: Shift Register, Universal Shift Register, Applications of Registers, Asynchronous counter, Synchronous counter, Mod-N Counter, binary up/down counter, Ring counter, Johnson counter.

Memories: Introduction to ROM, PROM, EPROM.

TEXT BOOKS:

1. Digital Design, 5/e, M.Morris Mano, Michael D Ciletti, PEA.
2. Fundamentals of Logic Design, 5/e, Roth, Cengage.

REFERENCE BOOKS:

1. Digital Logic and Computer Design, M.Morris Mano, PEA.
2. Digital Logic Design, Leach, Malvino, Saha, TMH.
3. Modern Digital Electronics, R.P. Jain, TMH.

III Sem	**DATA STRUCTURES AND ALGORITHMS**	Course Code: **V18CST02**	L	T	P
			3	0	0

COURSE OUTCOMES:

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

CO1: Explain Sorting and Searching techniques. [K2]
CO2: Demonstrate Singly Linked List and Double Linked List. [K3]
CO3: Interpret the basic operations on Stacks and Queues. [K3]
CO4: Demonstrate Binary Tree and Binary Search Tree [K3]
CO5: Compare Binary trees and Self-Balanced trees with appropriate examples. [K4]
CO6: Illustrate various graph algorithms.. [K3]

UNIT I: Algorithm Notations - performance analysis: Space complexity, time complexity – Asymptotic notation: Big O, Omega and Theta.
Sorting: Bubble Sort, Insertion Sort, Selection Sort, Quick Sort, Merge Sort, Radix Sort. **Searching**: Linear Search, Binary Search. Introduction to Hashing.
UNIT II: Types of Data Structures – Linear data structures and non-linear data structures. Representation of arrays - polynomial representation, addition of two polynomials, sparse representation, transpose of sparse matrix.
Single linked list: Representation of node, operations on single linked list, reverses the linked list,
Double linked list: operations like insert delete and display. Circular linked List.
UNIT III: Stacks Definition, array representation, linked list representation, Towers of hanoi, infix to postfix conversion, expression evolution, Multistack.
Queues definition, Array representation, linked list representation, operations on queues, Applications of Queues, Circular Queue.
UNIT IV: Trees: Introduction, Terminology, Representation of Trees.
Binary Trees: Properties of Binary Tress, Binary Tree Representation, operations, Tree Traversals – recursive, non-recursive.Binary Search Tree and its operations.
UNIT – V: Self-Balanced Trees - **AVL trees:** Definition, Representation of an AVL Tree, Height of AVL tree, AVL element searching, insert and delete element from AVL tree.
Priority Queues: Heaps Definition, types of heaps, properties and its operations.
UNIT – VI: Graphs: Graph Definition, properties, Graph Representation, Elementary Graph Operations. Graph Traversal techniques: Depth First Search, Breadth First Search.Spanning Trees: Kruskal's Algorithm, Prims Algorithm. Single source shortest Paths and all pair shortest path algorithm.

Text Books:

1. Data Structures, algorithms and applications in C++, SartajSahni, Universities press, Second Edition.

2. Fundamentals of Data Structures in C++, Ellis Horowitz, SartajSahni and Dinesh Mehta, 2nd Edition, Universities Press (India) Pvt. Ltd.

Reference Books:

1. An Introduction to Data Structures with Application, Jean-Paul Tremblay , Paul Sorenson, Second Edition.
2. Fundamentals of Data Structures and algorithms by C V Sastry, Rakesh Nayak, Ch. Raja Ramesh, IK Publications, new Delhi.
3. Data structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
4. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.

III Sem	**DISCRETE MATHEMATICS**	Course Code: **V18CST03**	L	T	P
			3	0	0

COURSE OUTCOMES:

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

CO1: Demonstrate the concepts associated with propositions and mathematical logic. **[K3]**

CO2: Demonstrate the basic concepts associated with relations, functions and their applications. **[K3]**

CO3: Illustrate algebraic structures and their applications in computer science. **[K3]**

CO4: Apply techniques of graphs for real-time problems **[K3]**

CO5: Demonstrate the concepts of trees in various real time problems. **[K3]**

CO6: Solve recurrence relations using various methods and problems based on combinatory. **[K3]**

UNIT-I Mathematical Logic: Statements and Notation , Connectives, Truth tables, Tautologies, Equivalence of formulas, Tautological Implications, Normal forms, Theory of inference for Statement Calculus, Indirect Method of Proof. Predicate calculus- Predicates, quantifiers, universe of discourse.

UNIT-II Set Theory and Relations: Basic concepts, Operations on Sets, Principle of Inclusion and Exclusion, Relations, Properties of Binary Relations in a set, Relation Matrix and Digraph, Equivalence, Partial Ordering Relations, Hasse Diagrams, Lattice and its Properties , Functions, Bijective Functions, Composition of Functions.

UNIT-III Algebraic Structures: Algebraic Systems and examples, Properties of Binary operations, Semi Groups, Monoids, Homomorphism of Semi groups and Monoids, Groups, Abelian Group, Subgroups.

UNIT-IV Graph Theory-I: Basic Concepts of graph, Representing graphs, Sub graphs, Isomorphic graphs, Paths and Circuits,Eulerian and Hamiltonian Graphs,Planar graphs, Graph Colouring , Chromatic Number.

UNIT-V Number Theory: Properties of integers, Division Theorem, The Greatest Common Divisor, Euclidean Algorithm, Least Common Multiple, Testing for Prime Numbers, The Fundamental Theorem of Arithmetic, Modular Arithmetic (Fermat's Theorem and Euler 's Theorem)

UNIT-VI Combinatorics and Recurrence Relations:

Combinatories: Basics of counting, permutations, combinations, inclusion-exclusion, pigeonhole principle.

Recurrence relations: Solving homogeneous and non-homogeneous recurrence relation by method of substituation, characteristic roots and generating function.

Text Books:

1. 1. Discrete Mathematical Structures with Applications to Computer Science, J. P. Tremblay and P. Manohar, 1st Edition, Tata McGraw Hill.
2. Discrete Mathematics and its Applications with Combinatorics and Graph Theory, K. H.Rosen, 7th Edition, Tata McGraw Hill..
3. Discrete Mathematics for Computer Scientists and Mathematicians, J. L. Mott, A. Kandel, T.P. Baker, 2nd Edition, Prentice Hall of India.

Reference Books:

1. Elements of Discrete Mathematics -A Computer Oriented Approach, C. L. Liu and D. P. Mohapatra,
2. 3rdEdition, Tata McGraw Hill.
3. 2.Discrete Mathematics with Combinatorics and Graph Theory, Santha, 1st Edition Cengage Learning.

III Sem	**OBJECT ORIENTED PROGRAMMING FOR PROBLEM SOLVING**	Course Code: **V18CST04**	L	T	P
			3	0	0

COURSE OUTCOMES:

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

CO1: Differentiate Procedural Oriented Programming and Object Oriented Programming. **[K2]**

CO2: Develop object oriented programs onclasses and objects. **[K3]**

CO3: Demonstrate various object-oriented concepts like Constructors, Destructors & Operator-Overloading. **[K3]**

CO4: Apply various Object Oriented features like Inheritance and Polymorphism to solve various computing Problems. **[K3]**

CO5: Develop programs to handle Exceptions & Files. **[K3]**

CO6: Describe Generic Programming. **[K3]**

UNIT I: Introduction to Object-Oriented Programming: Introduction to Object-Oriented Programming – Programming Paradigms, Features of Object Oriented Programming,Data Types, Variables, Constants, Operators ,Decision Statements &Control Structures, Arrays, Namespace, Default Arguments, Constant Arguments, Inputting Default Arguments, Reference Arguments.

UNIT II: Classes and Objects: Introduction to Classes and Objects: Defining Classes & Objects, Access specifiers, Scope Resolution Operator, Static Member variables, Static Member Functions, Array of Objects**.** Inline Functions, Overloading Member Functions, Objects as Function Arguments, Friend Functions, Friend Class, Local Class, Empty Class, Nested Classes, Return by Reference.

UNIT III: Object Initialization, Cleanup and Operator Overloading: Introduction to Constructors, Characteristics, Constructor with Default Arguments, Parameterized Constructors, Overloading Constructors, Copy Constructor, Dynamic Constructors and Destructors, Anonymous Objects .Introduction to operator Overloading, Rules for Overloading Operators, Overloading Unary & Binary Operators, this keyword, Constraint on Increment and Decrement Operators, Overloading with Friend Functions, Type Conversions.

UNIT IV: Inheritance and Polymorphism: Base class and Derived class, Single Inheritance, Multiple Inheritance, Multilevel Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual Base Classes, and Constructor in Derived Classes. qualifier classes and inheritance, Significance of Virtual Functions, Early Vs Late Binding, Pure Virtual Functions, Virtual Destructor.

UNIT V: Exception Handling and File Handling: Principles of Exception Handling, Keywords, Exception Handling Mechanism, Multiple Catch Statements, Catching Multiple Exceptions, Re-throwing Exception.File Opening Modes, File Stream Classes, I/O manipulators, Classes for File Handling, Sequential Access Files, Random Access Files, Error Handling Functions.

UNIT-VI: Generic Programming with Templates: Need for Templates,Class Templates, Function Templates,overloading Template Functions. Introduction to Standard Template Library, Sequential Containers & Associative Containers.

Text Books

1. Programming in C++, Ashok N Kamthane, 2nd Edition, Pearson.
2. C++ How to Program, Paul J. Deitel, Harvey Deitel, 6th edition, PHI publication.

References Books

1. Object Oriented Programming C++, Joyce Farrell, Cengage.
2. Mastering C++, Venugopal, Raj Kumar, Ravi Kumar, TMH.
3. The Complete Reference C++, HerbertSchildt, 4th Edition, Mcgraw Hill.
4. 4.Object Oriented Programming With C++, R. Subburaj, Vikas Publishing House.

III Sem	DIGITAL ELECTRONICS LAB	Course Code:V18ECL04	L	T	P
			0	0	2

COURSE OUTCOMES:

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

CO1: Apply the Boolean algebra to design digital logic circuits.

CO2: Analyse the behaviour of different combinational logic circuits.

CO3: Analyse the behaviour of different sequential logic circuits

CO4: Construct and troubleshoot simple combinational and sequential circuits

List of Experiments: ***Conduct any TEN experiments***

Study of Integrated Circuits, Bread board& Power supplies

1) Verification of Basic Logic Gates
2) Verification of Universal Gates, Special Gates.
3) Verify the De-Morgan laws using CMOS IC's
4) Design a Gray code encoder & Decoder using IC 7486
5) Construct a Half Adder using IC's and verify the truth table.
6) Construct a Half Subtract or using IC's and verify the truth table.
7) Verify the truth tableof IC 74138(3x8 Decoder)
8) Verify the truth table of IC 74153(4x1 MUX).
9) Verify the D Flip- Flop Using IC7474 with PRESET, CLEAR asynchronous Inputs.
10) Verify JK Flip- Flop & T Flip-Flop Using IC7476 with PRESET, CLEAR asynchronous Inputs.
11) Verify Decade counter using IC7490.
12) Design 4-bit right Shift Register using D-Flip-Flop and verify the truth table.

Add-on Experiments

1) Verify the read and write operations for the IC74189.
2) Design the Mod-6 counter usingIC74XX

Equipment Required:

1. IC TrainerKits
2. Electronic chips of allgates
3. PowerSupplies
4. Bread boards

III Sem	**DATA STRUCTURES AND ALGORITHMS LAB**	Course Code: **V18CSL02**	L	T	P
			0	0	3

COURSE OUTCOMES:

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

CO1: Construct programs on Sorting and searching Techniques. **[K3]**

CO2: Illustrate various operations on Singly Linked List. **[K3]**

CO3: Construct programs on Double Linked List. **[K3]**

CO4: Develop programs on Stacks, Queues and their Applications. **[K3]**

CO5: Implement various operations on Binary Search Tree. **[K3]**

CO6: Implement various shortest path algorithms. **[K3]**

List of Experiments

1. Programs to implement the following sorting techniques
   (a) Selection sort (b) Quick sort (c) Merge sort
2. Programs to implement the following searching methods
   (a) Linear search (b) Binary search.
3. A Program to Implement hash table and its operations.(Note: Use at least one collision resolution technique)
4. A Program to implement addition of two polynomials. (using arrays).
5. A Program to implement single linked list and its operations. (create, insert, delete, display)
6. A Program to implement double linked list and its operations.
7. A Program to implement stack operations using arrays.
8. A Program to convert infix expression to postfix expression.
9. A Program to implement queue operations using single linked list.
10. A Program to implement circular queue using arrays.
11. A Program to implement Binary search Tree and its operations.
12. A Program to implement AVL trees and its operations.
13. A Program to implement Heap sort.
14. A Program to implement graph traversal algorithms (BFS & DFS).
15. A Program to implement minimum spanning tree algorithms (Prims &Krushkal)
16. A Program to implement single source shortest path algorithm.

Text books:

1. Data Structures, algorithms and applications in C++, SartajSahni, Universities press, Second Edition.
2. Fundamentals of Data Structures in C++, Ellis Horowitz, SartajSahni and Dinesh Mehta, 2nd Edition, Universities Press (India) Pvt. Ltd.

Reference Books:

1. An Introduction to Data Structures with Application, Jean-Paul Tremblay , Paul Sorenson, Second Edition.
2. Fundamentals of Data Structures and algorithms by C V Sastry, Rakesh Nayak, Ch. Raja Ramesh, IK Publications, new Delhi.
3. Data structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
4. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.

III Sem	OBJECT ORIENTED PROGRAMMING FOR PROBLEM SOLVING LAB	Course Code: V18CSL03	L	T	P
			0	0	3

COURSE OUTCOMES:

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

CO1: Develop Programs on Classes and Objects. **[K3]**
CO2: Demonstrate Constructors and destructors. **[K3]**
CO3: Demonstrate Operator-Overloading. **[K3]**
CO4: Implement Inheritance and Polymorphism. **[K3]**
CO5: Develop programs to handle Exceptions & Files. **[K3]**
CO6: Illustrate Generic Programming. **[K3]**

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List of experiments:

1. Programs illustrating Various Control Structures.
2. Programs illustrating the use of following concepts.
   (a) Default Arguments b) Constant Arguments c) Reference Arguments
3. Programs illustrating the use of following concepts:
   a) Classes & Objects b) Inline functions
   c) Static Member functions d) Overloading of Member Functions
4. Programs illustrating the use of following concepts.
   a) Objects as Function Arguments b)Friend Functions , Friend class
   c) Local class d) Empty Class& Nested Classes
5. Programs illustrating the use of following concepts.
   a) Default constructor b) Constructor with arguments c) Copy constructor
6. Programs to illustrate the Overloading of various operators.
   a) Binary b) Unary c) new d) delete
7. Programs illustrating the various forms of Inheritance.
   a) Single b) Multilevel c) Hierarchical d) Hybrid
8. Program illustrating the use of Virtual Functions &Virtual Base class.
9. Programs illustrating how Exceptions are handled.
   a) Division-by-zero b) Overflow in an array
10. Programs illustrating file handling operations:
    a) Copying text files b) Displaying the contents of the file
11. Programs illustrating Class template and Overloading Function Template.
12. Programs illustrating Sequential Containers & Associative Containers.

Text Books

1. Programming in C++, Ashok N Kamthane, 2nd Edition, Pearson.
2. C++ How to Program, Paul J. Deitel, Harvey Deitel, 6th edition, PHI publication.

III Sem	**Professional Communication Skills - I**	Course Code: **V18ENT03**	L	T	P
			3	0	0

Syllabus Details

1. *Course Outcomes: After successful completion of the Course, the student will be able to:*

CO1: Summarize one's introduction in an appropriate manner, exhibit grammatical competence through correction of sentences, analyze noun and pronoun dispositions and develop pre-reading strategies to improve comprehension skills.[K5]

CO2: Distinguish singular and plural in different contexts and display knowledge through accurate usage of sentences, build conversations which befit the situations, comprehendthe passages well and, use different kinds of idioms. [K4]

CO3: Classify various kinds of adjectives and adverbs, learn natural occurrence of paired words of native speakers, infer the referential and inferential aspects of the passages and make use of idioms while narrating personal experiences. [K4]

CO4: Judge and assess the behaviour of people in day to day life using kinesics and proxemics that disclose their disposition and be aware of their personal traits that promote good relations. (K2)

CO5: Articulate their goals and have a constructive plan of executing them properly and become adept in oral presentations as well as poster presentations that enhance their professional skills. (K3)

CO6: Evaluate various happenings by thinking out of the box and display their latent talent. They can also reduce the stress levels by applying various stress management techniques. (K4)

2. Syllabus

UNIT – I

SELF-INTRODUCTION: Basic information - Academic and personal - interests– strengths and weaknesses – goal.

ERROR ANALYSIS: Nouns & Pronouns – Singular & Plural – Kinds of Nouns & Pronouns- Collective Nouns - Personal and Reflexive Pronouns.

READING COMPREHENSION: Reading as a skill – quick reading - analyzing – answering **IDIOMS& PHRASES**: Colloquial expressions– formal and informal expressions.

UNIT – II

ERROR ANALYSIS: Concord – Subject – Verb agreement.

ROLE PLAY: Day to day situations - practical approach – real life experiences. **READING COMPREHENSION:** Skimming – scanning - summarizing – problem solving.

IDIOMS & PHRASES: Enriching written and spoken English – use and usage.

UNIT – III

ERROR ANALYSIS: Adjectives – Adverbs – role of modifiers – place of Adjectives– Adverbs of frequency.

COLLOCATIONS: Natural combination of words – closely affiliated with each other.

READING COMPREHENSION: At a glance – close reading – understanding – answering

IDIOMS & PHRASES: Communicative - expressive – competent.

UNIT -IV

INTER AND INTRA PERSONAL SKILLS: Leading, Coaching,

Interviewing, Managing, Persuading - Self awareness, Self confidence, Good Attitude.

BODY LANGUAGE: Basics of proxemics and kinesics.

UNIT -V

PRESENTATION SKILLS: Importance of Presentation skills, Structuring our presentations, Ways to improve our presentation skills, Tips for effective presentations.– oral – Power point – poster.

GOAL SETTING: Short-term – long-term – aim – target – vision – How to set SMART goals.

UNIT - VI

LATERAL THINKING: What is creativity, Fundamental approaches to smart thinking, Characteristics of a creative person, Convergent and Divergent thinking.

STRESS MANAGEMENT: Meaning of Stress, Types of Stress, Symptoms of stress, Short term and long term stress, how can people manage stress.

3. Reference:

1. Essential English Grammar - Raymond Murphy

2. Advanced English Grammar – D.S. Paul

3. Word Power Made Easy – Norman Lewis

4. English collocations in use - Michael McCarthy

5. Word Power Made Handy - ShaliniVarma

6. Barron's GRE - Barron's

7. Current English Grammar & Usage – R.P Sinha

8. Think & Grow Rich - NapoleaonHill

9. Soft Skills for Everyone - Butterfield, Jeff,

10. Soft Skills - Chauhan, G.S. and Sangeeta Sharma

11. Theories of Personality - Hall, Calvin S

12. Corporate Conversations - Holtz, Shel

13. Communication Skills - Kumar, Sanajy and PushpLata

14. Winning at Interviews - Thorpe, Edgar and Showick Thorpe

15. Swami Vivekananda and "Personality Development" published by RK Math.

III Sem	**Technical Skills - I**	Course Code: V18CST60	L	T	P
			0	0	4

Syllabus Details

Module-1: Problem Solving using C-I

Course Outcomes: After successful completion of the Course, the student will be able to:

CO1 : Build programs using Variables and Operators.(K3)

CO2 : Identify and resolve compilation errors for conditional statements.(K3)

CO3 : Develop problems using looping constructs.(K3)

CO4 : Model the problems using functions.(K3).

CO5 : Develop problems using Arrays (K3).

CO6 : Make use of Strings to solve the given problem(K3)

Syllabus

1. **I/O Statements, Operators and Expressions**
2. **Problem Solving Using Conditional Statements**
3. **Looping Constructs**
4. **Functions**
5. **2-D Arrays**
6. **Strings**

Text Books:

1. Let us C: Yesvanth Kanetkar, BPB Publications, 16th Edition
2. Working With C, Yashavant P. Kanetkar, BPB Publications
3. Test Your C Skills, Yashavant P. Kanetkar, BPB Publications

IV Sem	**COMPUTER ORGANIZATION**	Course Code: **V18CST05**	L	T	P
			3	0	0

COURSE OUTCOMES:

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

CO1: Illustrate Basic structure of Computers, Instruction types and their addressing modes. **[K2]**

CO2: Describe the different modes of Input / Output transfer. **[K2]**

CO3: Illustrate different types of Memory. **[K2]**

CO4: Describe the different types of Control Unit techniques. **[K2]**

CO5: Illustrate the Fixed point and Floating point arithmetic operations of ALU. **[K2]**

CO6: Explain the concept of Pipelining. **[K2]**

UNIT-I: Introduction:

Functional Units, Basic Operational Concepts, Bus Structures.

Instruction Sequencing and Addressing Modes: Instructions and Instruction Sequencing, Addressing modes, Basic Input/Output Operations.

UNIT-II: Input/Output Organization:

Accessing Input/Output devices, Interrupts- Interrupt Hardware, Enabling and Disabling Interrupts, Handling Multiple Devices, Direct Memory Access, Buses-Synchronous and Asynchronous.

UNIT-III: Memory Organization:

Memory Hierarchy, Main Memory, Auxiliary Memory, Associative memory, Cache Memory. **(Morris Mano)**

UNIT-IV: Processing Unit:

Fundamental Concepts, Execution of a Complete Instruction, Multiple-Bus Organization, Hardwired Control, Micro programmed Control-Microinstructions, Micro program Sequencing.

UNIT-V: Arithmetic Logic Unit:

Introduction, Addition and Subtraction, Multiplication Algorithms, Division Algorithms, Floating-Point Arithmetic Operations. **(Morris Mano)**

UNIT-VI: Pipelining:

Basic Concepts, Data Hazards, Instruction Hazards, Datapath and Control Considerations.

Text Books:

1. Computer Organization, Carl Hamacher, ZvonkoVranesic, SafwatZaky, 5th Edition, McGraw Hill Education.
2. Computer System Architecture, M. Morris Mano, 3rd Edition, Pearson Education.

Reference Books:

1. Computer Organization and Architecture, William Stallings, 10th Edition, Pearson Education.

2. Computer Architecture and Organization, John P. Hayes, 3rd Edition, McGraw Hill Education.

IV Sem	SOFTWARE ENGINEERING	Course Code: V18CST06	L	T	P
			3	0	0

COURSE OUTCOMES:

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

CO1: Demonstrate Software Process Models. **[K3]**
CO2: Illustrate Requirement Engineering Process. **[K3]**
CO3: Discuss Software architecture and Design. **[K2]**
CO4: Apply Coding principles and Testing techniques **[K3]**
CO5: Discuss Software Estimation and Maintenance. **[K2]**
CO6: Describe Quality Management and Metrics. **[K2]**

UNIT-I: The nature of Software: Defining Software, Software application Domains, Legacy software. Software engineering, the software process, software Myths.

Software development process models: Waterfall model, Prototyping, Iterative development, Unified process, Extreme programming and agile process. Merits and Demerits of Software Process Models.

UNIT-II: Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the Software requirements document

Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

UNIT-III: Software Architecture: Role of software architecture, Architecture views, components and connector view, architecture styles for C & C view, documenting architecture design, evaluating architectures.

Design: Design concepts, Function-oriented design, Object oriented design, Detailed design.

UNIT-IV: Coding and Testing: Programming principles and guidelines, incrementally developing code, managing evolving code. Testing concepts, testing process, Black-box testing, White-box testing.

Risk management: Reactive vs. Proactive Risk strategies, Software risks, Risk identification, Risk projection, Risk refinement, RMMM Plan.

UNIT-V: Software Project estimation: Decomposition techniques, Empirical Estimation Models.

Software Maintenance: Maintenance Process, Reverse Engineering, Reengineering, Configuration Management

UNIT-VI: Metrics for Process and Products: Software Measurement, Metrics for software quality.

Quality Management: Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, SEI-CMM Model, Six Sigma and ISO 9000 quality standards.

Text Books:

1. Software Engineering, A practitioner's Approach- Roger S.Pressman, 7th Edition, McGrawHill International Edition.
2. Software Engineering- Ian Sommerville, 9th Edition, Pearson education.
3. Software Engineering, A Precise approach, PankajJalote, Wiley

Reference Books:

1. CMMI and Six Sigma: Partners in Process Improvement , Jeannine M. Siviy, M. Lynn Penn, Robert W. Stoddard, 1st edition, Addison Wesley;
2. Software Engineering principles and practice, W S Jawadekar, 3rdEdition,TMH

IV Sem	**FORMAL LANGUAGES AND AUTOMATA THEORY**	Course Code: **V18CST07**	L	T	P
			3	0	0

COURSE OUTCOMES:

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

CO1: Construct DFA, NFA and Є-NFA. [**K3**]

CO2: Produce Regular expressions, Regular Grammars. [**K3**]

CO3: Construct Context Free Grammars, Context Free Languages.[**K3**]

CO4: Construct Pushdown Automata and its equivalence with CFG.[**K3**]

CO5: Construct Turing machine. [**K3**]

CO6: Discuss Decidability Theory. [**K2**]

UNIT-I: Alphabet, Strings, Language, Finite Automaton Definition, Transition Systems, Acceptance of Strings by Finite Automata, DFA, Design of DFA, NFA, Design of NFA, Equivalence between NFA and DFA, Finite Automata with ϵ-Transition, Equivalence between NFA and ϵ-NFA, Minimization of Finite Automata, Equivalence between two Finite Automata, Moore and Mealy machines and their equivalences, Applications of Finite Automata.

UNIT-II: REGULAR EXPRESSIONS: Regular expressions, Identity rules, Equivalence between two Regular Expressions, Equivalence between Regular Expressions and Finite Automata, Pumping lemma, Closure properties of regular sets(proofs not required),Regular Sets and Regular grammars, Equivalence between Regular grammar and FA, Regular Expressions and Regular Grammar.

UNIT-III: CONTEXT FREE GRAMMARS: Formal Languages, Grammars, Classification of Grammars, Chomsky Hierarchy, Context free Grammars, Derivation of string, Left Most Derivations, Right Most Derivations, parse trees, Ambiguity in Context-Free Grammars, Simplification of Context Free Grammars, Normal Forms-Chomsky Normal Form (CNF), Greibach Normal Form (GNF),Pumping Lemma, Closure Properties, Applications of Context Free Languages.

UNIT-IV: PUSHDOWN AUTOMATA: Definitions, Instantaneous descriptions, Languages of a PDA, Equivalence of Pushdown automata and CFG's, Deterministic pushdown automata: Definition DPDA, Regular Languages and DPDA , DPDA and context free languages.

UNIT-V: TURING MACHINE: Definition, Model, Representation of Turing Machines: Instantaneous Description, Transition Tables and Transition Diagrams, Language Acceptance of a Turing Machine, Design of Turing Machine (TM) , Types of TM's (Proofs not required).

UNIT-VI: Recursive languages, Recursive Enumerable Language, Closure Properties of Recursive languages & Recursive Enumerable, Universal Turing Machine. Decidable and Un-decidable Languages, Halting Problem of Turing Machines, Post Correspondence Problem, Modified Post's Correspondence Problem.

Text Books:

1. Introduction to Automata Theory, Languages and Computation, J.E.Hopcroft, R.MotwaniandJ.D.Ullman, 3rdEdition, Pearson, 2008.
2. Theory of Computer Science-Automata ,Languages and Computation, K.L.P.Mishra and N.Chandrasekharan, 3rdEdition,PHI, 2007.
3. Peter Linz, "An Introduction to Formal Language and Automata", ThirdEdition, Narosa Publishers, New Delhi, 2002

Reference Books:

1. 1.Introduction to Automata Theory, Formal Languages and Computation, ShyamalenduKandar, Pearson, 2013.
2. Theory of Computation, V.Kulkarni, Oxford UniversityPress, 2013.
3. Theory of Automata, Languages and Computation, RajendraKumar, McGraw Hill, 2014.
4. Formal Language and Automata Theory, K.V.N.Sunitha and N.Kalyani, Pearson, 2015.
5. John C Martin, "Introduction to Languages and the Theory of Computation", Third Edition, Tata McGraw Hill Publishing Company, New
6. Delhi, 2007
7. Kamala Krithivasan and Rama. R, "Introduction to Formal Languages, Automata Theory and Computation", Pearson Education 2009.

IV Sem	**JAVA PROGRAMMING**	Course Code: **V18CST08**	L	T	P
			3	0	0

COURSE OUTCOMES:

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

CO1: Describe Java Virtual Machine and Type casting. [**K2**]

CO2: Demonstrate Concepts like Constructors, Arrays, Nested Classes and Command Line Arguments. [**K3**]

CO3: Implement Concepts of Inheritance and Exception Handling [**K3**]

CO4: Develop programs on Multi-Threading and Files [**K3**]

CO5: Demonstrate Applet Programming and AWT Components. [**K3**]

CO6: Describe Event Handling and Swings. [**K3**]

UNIT-I: Introduction to Java: Introduction to Object Oriented Paradigm, Concepts of OOP, Applications of OOP, History of Java, Java Features, JVM, Program Structure. Variables, Primitive Data Types, Constants, Operators, Expressions, Precedence rules and Associativity, Primitive type conversion and Casting, Control Structures.

UNIT-II: Classes and Objects: Classes and objects, Class declaration, Creating objects, Methods, Constructors and Constructor Overloading, Importance of Static Keyword and Examples, this Keyword, Arrays, Command Line Arguments, Nested Classes.

UNIT-III: Inheritance and Exception Handling: Inheritance, super Keyword, final Keyword, Method Overriding and Abstract Class. Interfaces, Creating Packages, Using Packages, Importance of Class path. Exception Handling, Importance of try, catch, throw, throws and finally Block.

UNIT-IV: Multithreading and Files: Introduction, Thread Lifecycle, Creation of Threads, Thread Priorities, Thread Synchronization, Communication between Threads. Reading Data from Files and Writing Data to Files, Random Access Files.

UNIT-V: Applet Programming and AWT: Applet Class, Applet Lifecycle, Applet Programs. Introduction to AWT, Components and Containers, Button, Label, Checkbox, Radio Buttons, List Boxes, Layouts, Menu and Scrollbar.

UNIT-VI: Event Handling and Swings: Event Handling : Event Delegation Model, Sources of Events, Event Listeners, Adapter Classes, InnerClasses. Introduction to Swings.

Text Books:

1. Java Proramming, E.Balagurusamy, 4thEdition , TMH.
2. The complete Reference Java, 8thEdition, Herbert Schildt, TMH.
3. Introduction to java programming ,Y Daniel Liang, 7th Edition, Pearson.

Reference books:

1. Core Java: An Integrated Approach , R Nageswara Rao, 7th Edition, Dream Tech
2. Head First Java , Kathy Sierra and Bert Bates, 2nd Edition O'reilly

IV Sem	PYTHON PROGRAMMING	Course Code: V18CST09	L	T	P
			3	0	0

COURSE OUTCOMES:

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

CO1: Illustrate basic concepts of Python Programming. **[K2]**
CO2: Describe control structures in python. **[K2]**
CO3: Demonstrate functions and packages. **[K3]**
CO4: Construct python programs using structured data types. **[K3]**
CO5: Compare TextFiles and Binary Files. **[K4]**
CO6: Apply OOPs concepts to Develop Test cases. **[K3]**

UNIT-I: Introduction to Python, Data Types & Operators: Basics of python programming: Features of python – History of Python - The Future of Python installation and execution - Data types – Identifiers - variables – type conversions- Literal Constants – Numbers – Strings. I/O statements. Operators and expressions, operator precedence – expression evaluation.

UNIT-II: Control Structures: Decision Control statements: conditional (if), alternative (if-else), chained conditional (if-elif-else);

Iteration: while loop, for loop, nested for loop, range function, break, continue and pass statements.

UNIT-III: Functions :Functions & modules : Introduction - Function Declaration &Definition - Function Call – Variable Scope and Lifetime - The return statement- More on Defining Functions - Lambda Functions or Anonymous Functions - Documentation Strings- Modules – Packages.

UNIT-IV: Structured Data Types: Lists: list operations, list slices, list methods, cloning lists, list parameters. **Tuples**: tuple assignment, tuple as return value. **Set:** Set Creation, Set Operations. **Dictionaries**: Creation, operations; comprehension, operations on strings.

UNIT-V: Files & Exception Handling: Introduction - Types of files - Text files - reading and writing files; Errors and exceptions handling.

UNIT-VI: OOPS concepts and Testing Basics: Classes, Methods, Constructor, Inheritance, Overriding Methods, Data hiding, GUI programming with TKINTER.

Text Books:

1. "Python Programming using problem solving Approach" ReemaThareja, Oxford University Press – 2017.
2. Python with Machine Learning by A.Krishna Mohan, Karunakar & T.Murali Mohan by S. Chand Publisher-2018.

Reference Books:

1. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2nd edition, Updated for Python 3, Shroff /O'Reilly Publishers, 2016 .

2. Guido van Rossum and Fred L. Drake Jr, —An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.
3. John V Guttag, —Introduction to Computation and Programming Using Python“, Revised and expanded Edition, MIT Press , 2013
4. Robert Sedgewick, Kevin Wayne, Robert Dondero, —Introduction to Programming in Python:

IV Sem	**Managerial Economics and Financial Analysis**	Course Code: **V18MBET51**	L	T	P
			3	0	0

Syllabus Details

Course Outcomes: After successful completion of the Course, the student will be able to:

CO1: Understand the basic concepts of managerial economics, demand, and elasticity of demand and methods of demand forecasting. **[K2]**

CO2: Estimate the production function with one, two and infinite variables. Understanding various cost concepts and calculating breakeven point **[K2]**

CO3: Understand and showing a price output determination in different types of market structures and knowing various pricing methods **[K2]**

CO4: Understanding various forms of business organizations **[K2].**

CO5: Prepare the financial statements and its analysis **[K3].**

CO6: Appraise the projects by using various capital budgeting methods **[K4].**

UNIT-I: Introduction to Managerial Economics and demand Analysis: Definition of Managerial Economics –Scope of Managerial Economics and its relationship with other subjects – Concept of Demand, Types of Demand, Determinants of Demand- Demand schedule, Demand curve, Law of Demand and its limitations- Elasticity of Demand, Types of Elasticity of Demand and Measurement- Demand forecasting and Methods of forecasting..

UNIT–II: Production and Cost Analyses: Concept of Production function- Cobb-Douglas Production function- Law of Variable proportions-Isoquants and Isocosts and choice of least cost factor combination-Concepts of Returns to scale and Economies of scale-Different cost concepts: opportunity costs, explicit and implicit costs-Fixed costs, Variable Costs and Total cost –Cost–Volume-Profit analysis- Determination of Breakeven point(simple problems)Managerial significance and limitations of Breakeven point.

UNIT–III: Introduction to Markets, & Pricing Policies: Market Structures: Perfect Competition, Monopoly, Monopolistic competition and Oligopoly – Features – Price and Output Determination – Methods of Pricing: Average cost pricing, Limit Pricing, Market Skimming Pricing, Internet Pricing, Flat Rate Pricing, Usage sensitive pricing and Priority Pricing.

UNIT–IV: Types of Business Organization and Business Cycles:

Features and Evaluation of Sole Trader, Partnership, Joint Stock Company

– State/Public Enterprises and their forms – Business Cycles : Meaning and Features – Phases of Business Cycle.

UNIT–V: Introduction to Accounting & Financing Analysis: Introduction to Double Entry Systems – Preparation of Financial Statements-Analysis and Interpretation of Financial Statements-Ratio Analysis

UNIT–VI: Capital and Capital Budgeting: Capital Budgeting: Meaning of Capital-Capitalization-Meaning of Capital Budgeting-Time value of money- Methods of appraising Project profitability: Traditional Methods and modern methods (simple problems)

TEXT BOOKS

Dr. N. AppaRao, Dr. P. Vijay Kumar: 'Managerial Economics and Financial Analysis', Cengage Publications, New Delhi – 2011

Dr. A. R. Aryasri – Managerial Economics and Financial Analysis, TMH 2011

Prof. J.V.Prabhakararao, Prof. P. Venkatarao. 'Managerial Economics and Financial Analysis', Ravindra Publication.

REFERENCES:

1. *ShailajaGajjala and UshaMunipalle, Univerties press, 2012.*
2. Dr. B. Kuberudu and Dr. T. V. Ramana: Managerial Economics & Financial Analysis, Himalaya Publishing House, 2014.
3. V. Maheswari: Managerial Economics, Sultan Chand.2014
4. Suma Damodaran: Managerial Economics, Oxford 2011.
5. VanithaAgarwal: Managerial Economics, Pearson Publications 2011.
6. Sanjay Dhameja: Financial Accounting for Managers, Pearson
7. Maheswari: Financial Accounting, Vikas Publications.
8. S. A. Siddiqui& A. S. Siddiqui: Managerial Economics and Financial Analysis, New Age International Publishers, 2012
9. Ramesh Singh, Indian Economy, 7th Edn., TMH2015
10. PankajTandonA Text Book of Microeconomic Theory, Sage Publishers, 2015

IV Sem	JAVA PROGRAMMING LAB	Course Code: V18CSL04	L	T	P
			0	0	3

COURSE OUTCOMES:

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

CO1: Develop Programs to handle on Classes and Objects **[K3]**
CO2: Demonstrate Constructors and Arrays. **[K3]**
CO3: Demonstrate Inheritance and Exception Handling. **[K3]**
CO4: Implement programs on Multi-Threading. **[K3]**
CO5: Illustrate File Handling Mechanisms. **[K3]**
CO6: Demonstrate GUI Programming using Applets and Swings. **[K3]**

List of Experiment

1. Programs illustrating Control Structures and Type Conversions in java.
2. Programs illustrating the use of following concepts:
   a) Classes & Objects b) Usage of static c) Constructors
3. Programs illustrating the use of following concepts.
   a) Arrays b) Nested Classes c) Command Line Arguments
4. Programs illustrating the use of following concepts.
   a) Inheritance b) Usage of super c)Method Overriding
5. Programs to illustrate the Overloading of various operators.
   a) Usage of final b) Abstract class c) Interfaces
6. Programs illustrating the various concepts like.
   a) Packages b) Exception Handling
7. Programs illustrating how Multi-Threading implemented.
   a) Multiple Threads on Single Object b) Thread Deadlock
8. Programs illustrating Thread Communication.
9. Programs illustrating reading from and writing to files.
   a) Sequential Files b) Random Access Files
10. Programs illustrating GUI using Applets & AWT Components.
11. Programs to illustrate Event Handling using Listener Interfaces.
12. Programs illustrating GUI using Swings.

Text books:

1. The complete Reference Java, 8th Edition, Herbert Schildt, TMH.
2. Introduction to java programming, Y Daniel Liang, 7th Edition, Pearson.

IV Sem	PYTHON PROGRAMMING LAB	Course Code: V18CSL05	L	T	P
			0	0	3

COURSE OUTCOMES:

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

CO1: Demonstrate Basic Python Programs **[K3]**
CO2: Construct control structures in python **[K3]**
CO3: Demonstrate functions and packages. **[K3]**
CO4: Construct python programs using structured data types. **[K3]**
CO5: Demonstrate Text Files and exception handling. **[K3]**
CO6: Test Rock – paper – Scissors game. **[K4]**

Exercise 1 - Basics

a) A sample Python Script using command prompt, Python Command Line andIDLE
b) A program to purposefully raise an Indentation Error and correct it

Exercise 2 - Operations

a) A program to compute distance between two points taking input from the user (Pythagorean Theorem)
b) A program on add.py that takes 2 numbers as command line arguments and prints its sum.

Exercise - 3 Control Flow

a) A Program to implement for checking whether the given number is a even number or not.
b) A program to construct reverse the digits of a given number and add it to the original, If the sum is not a palindrome repeat this procedure.
c) A program using a while loop that asks the user for a number, and prints a countdown from that number to zero.

Exercise 4 - Control Flow – Continued

a) A program to construct the following pattern, using a nested for loop.

```
*
* *
* * *
* * * *
* * * * *
* * * *
* * *
* *
*
```

b) By considering the terms in the Fibonacci sequence whose values do not exceed four million,find the sum of the even-valued terms.

Exercise - 5 – Problem Solving using Functions

a) Find mean, median, mode for the given set of numbers passed as arguments to a function

b) Develop a function nearly_equal to test whether two strings are nearly equal. Two strings a and b are nearly equal when a can be generated by a single mutation on b.

c) Develop a Recursive Function to find the Factorial of a given number.

d) Develop function to compute gcd, lcm of two numbers. Each function shouldn't exceed one line.

Exercise - 6 Structured Data types

a) a program to count the number of strings where the string length is 2 or more and the first and last character are same from a given list of strings.

b) a program to develop unzip a list of tuples into individual lists and convert them into dictionary.

Exercise – 7 Structured Data types Continued

a) A program to count the numbers of characters in the string and store them in a dictionary data structure

b) A program to use split and join methods in the string and trace a birthday with a dictionary data structure.

Exercise - 8– Modules

a) Install packages requests, flask and explore themusing (pip)

b) A program to implement a script that imports requests and fetch content from the page. Eg. (Wiki)

c) Develop a simple script that serves a simple HTTPResponse and a simple HTML Page

Exercise - 9 Files

a) A program to count frequency of characters in a given file. Can you use character frequency to tell whether the given file is a Python program file, C program file or a text file?

b) A program to compute the number of characters, words and lines in a file.

Exercise - 10 OOP

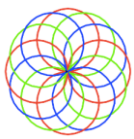
a) Class variables and instance variable and illustration of self variable

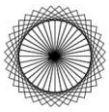
i) Robot

ii) ATM Machine

Exercise - 11 GUI, Graphics

1. Develop a GUI for an Expression
2. A program to implement the following figures using turtle





Case Study: Implement Rock – paper – Scissors game using TKINTER.

Text Books:

1. "Python Programming using problem solving Approach" ReemaThareja, Oxford University Press – 2017.

2. Python with Machine Learning by A.Krishna Mohan, Karunakar & T.Murali Mohan by S. Chand Publisher-2018.

IV Sem	**Constitution of India**	Course Code: **V18ENT11**	L	T	P
			2	0	0

Syllabus Details

1. **Course Outcomes: At the end of the Course student will be able to:**

CO1: Summarize the evolution and historical importance of Indian constitution from 1858 to 1947. [K2]

CO2: Explain various stages in the composition of Indian Constitution. [K2]

CO3: Develop awareness about their primary rights and duties & build up their civic sense. [K3]

CO4: Comprehend the distribution of powers between the center and states. (K4)

CO5: Summarize and sketch the specific roles of heads of Nation and the functioning of legislative bodies. (K2)

CO6: Explain the role of local self-government in strengthening democracy. (K1)

Constitution of India – Basic features and fundamental principles

The Constitution of India is the supreme law of India. Parliament of India cannot make any law which violates the Fundamental Rights enumerated under the Part III of the Constitution. The Parliament of India has been empowered to amend the Constitution under Article 368, however, it cannot use this power to change the "basic structure" of the constitution, which has been ruled and explained by the Supreme Court of India in its historical judgments. The Constitution of India reflects the idea of "Constitutionalism" – a modern and progressive concept historically developed by the thinkers of "liberalism" – an ideology which has been recognized as one of the most popular political

ideology and result of historical struggles against arbitrary use of sovereign power by state. The historic revolutions in France, England, America and particularly European Renaissance and Reformation movement have resulted into progressive legal reforms in the form of "constitutionalism" in many countries. The Constitution of India was made by borrowing models and principles from many countries including United Kingdom and America.

The Constitution of India is not only a legal document but it also reflects social, political and economic perspectives of the Indian Society. It reflects India's legacy of "diversity". It has been said that Indian constitution reflects ideals of its freedom movement, however, few critics have argued that it does not truly incorporate ourown ancient legal heritage and cultural values. No law can be "static" and therefore the Constitution of India has also been amended more than one hundred times. These amendments reflect political, social and economic developments since the year 1950. The Indian judiciary and particularly the Supreme Court of India has played an historic role as the guardian of people. It has been protecting not only basic ideals of the Constitution but also strengthened the same through progressive interpretations of the text of the Constitution. The judicial activism of the Supreme Court of India and its historic contributions has been recognized throughout the world and it gradually made it "as one of the strongest court in the world".

Course content

1. Meaning of the constitution law and constitutionalism
2. Historical perspective of the Constitution of India
3. Salient features and characteristics of the Constitution ofIndia
4. Scheme of the fundamental rights
5. The scheme of the Fundamental Duties and its legalstatus
6. The Directive Principles of State Policy – Its importance andimplementation
7. Federal structure and distribution of legislative and financial powers between the Union and the States
8. Parliamentary Form of Government in India – The constitution powers and

status of the President of India

9. Amendment of the Constitutional Powers and Procedure

10. The historical perspectives of the constitutional amendments inIndia

11.Emergency Provisions : National Emergency, President Rule, Financial Emergency

12. Local Self Government – Constitutional Scheme in India

13. Scheme of the Fundamental Right to Equality

14. Scheme of the Fundamental Right to certain Freedom under Article19

15. Scope of the Right to Life and Personal Liberty under Article21

Unit-I: Historical Perspective of the Indian Constitution – A brief discussion of various Acts i.e from 1858 to 1947 passed by the British Government.

Unit–II: Constitution of India

a) Preparation of Indian constitution by Constituent Assembly of India.

b) Preamble or Philosophy of the Indian Constitution.

c) Salient features of the Indian constitution.

Unit-III:

a) Fundamental Rights - their importance& Limitations

b) Fundamental Duties and their importance

c) Directive principles of the state policy and their implementation

Unit-IV: Indian Federalism

a) Distribution of powers between Union and State Governments

b) Legislative, Executive and Financial relations between Union and State Governments

Unit-V: Parliamentary form of Government in India

1.Union Executive

a) President of India- Powers and functions

b) Vice-President - Powers and functions

c) Prime Minister and Council of Minister - Powers and functions

2. Union Legislature

a) RajyaSabha – Powers and Functions

b) LokSabha- Powers and Functions

c) Amending Procedure- Important Constitutional Amendments – 42nd, 44 Constitutional Amendment Acts.

3. Judiciary – Supreme court of India - Powers and Functions

Unit-VI: Local Self–government in India 73rd & 74th Constitutional Amendments Acts

Reference Books:

1. D DBasu-Introduction to the constitution of India – 18th Edition. Prentice – Hall of India Private Ltd-New Delhi-1998

2. Granville Austin (1972) the Indian Constitution, Cornerstone of a Nation Oxford university Press, New Delhi

3. Madhavkhosla (2012) the Indian Constitution, oxford university press, New Delhi

4.Granville Austin (1999) Working a Democratic Constitution; A History of the Indian Experience, Oxford University Press, New Delhi

5.ZoyaHasan, Sridharan E and Sudharshan R (Eds) 2002 India's living Constitution, Permanent black, New Delhi

6.BaxiUpendra (1980) the Indian Supreme Court and Politics Eastern book co, Lucknow

IV Sem	**Professional Communication Skills - II**	Course Code: **V18ENT04**	L	T	P
			3	0	0

Syllabus Details

1. Course Outcomes: At the end of the Course student will be able to:

CO1: Correlate individual words into one whole sentence using new vocabulary and focus on the error analysis of prepositions and conjunctions. ***[K4]***

CO2: Distinguish and acquire knowledge of using words of same category in a sentence and learn new words that promote communicative finesse. **[K5]**

CO3: Find errors in sentences where the modifiers are misplaced and put them at the appropriate place, use hit pair words and send an email that is concise and lucid **[K5]**

CO4: Interpret the importance of Attire and Etiquette in societal context and manage their time. [**K2]**

CO5: Discover the team working abilities among themselves and display their leadership qualities. **[K3]**

CO6: Identify various elements of emotional balance that have positive impact on work-life-balance. **[K2]**

2. Syllabus

UNIT – I

ERROR ANALYSIS: Prepositions - kinds of prepositions –appropriate use - conjunctions –sub- ordinating– co-ordinating.

VOCABULARY: Etymology **–** roots – suffixes – prefixesand one word substitutes.

SENTENCE IMPROVEMENT: Better choice – error-free sentences – effective – syntax.

UNIT – II

ERROR ANALYSIS: Parallel grammatical forms – same grammatical structures.

VOCABULARY: Words that describe personalities – faiths – professions – medical specialists and Word Clusters.

EXPANSION OF PROVERBS: Meaning – interpretation – explanation.

UNIT – III

ERROR ANALYSIS: Dangling modifiers – misplacement of modifiers – arrangement.

VOCABULARY: Antonyms and Synonymsand Foreign expressions.

EMAIL WRITING: Format – method of exchanging – technicalities.

UNIT- IV

ATTIRE & ETIQUETTE: Formal – informal- professional – social Attires, Meaning of Etiquette, Need for etiquette, Types of Etiquette.

TIME - MANAGEMENT: Value of time – Setting priorities – effective use of time – ABCD analysis, Pareto Principle, Eisenhower Method.

UNIT -V

TEAM WORK – Benefits of working with a team – Team Dynamics . LEADERSHIP QUALITIES: Leadership Styles, Characteristics of a Good Leader, Big 5 Personality traits, Myths about leadership qualities.

UNIT -VI

EMOTIONAL INTELLIGENCE: What is EI – Daniel Goleman model of EI, Qualities of an Emotionally Intelligent Person - Emotional balance – feelings – thoughts – motivation.

WORK – LIFE - BALANCE: Personal life – professional life – cause of work-life imbalances, consequences of work-life imbalance, Role of gender and family – improving work life balance.

3.Reference:

1. Essential English Grammar - Raymond Murphy
2. Advanced English Grammar – D.S. Paul
3. Word Power Made Easy – Norman Lewis
4. English collocations in use - Michael McCarthy
5. Word Power Made Handy - ShaliniVarma
6. Barron's GRE - Barron's
7. Current English Grammar & Usage – R.P Sinha
8. Think & Grow Rich - Napoleaon Hill
9. Soft Skills for Everyone - Butterfield, Jeff,
10. Soft Skills - Chauhan, G.S. and

Sangeeta Sharma

11. Theories of Personality - Hall, Calvin S

12. Corporate Conversations - Holtz, Shel

13. . Communication Skills - Kumar, Sanajy and PushpLata

14. Winning at Interviews - Thorpe, Edgar and Showick Thorpe

15. Swami Vivekananda and "Personality Development" published by RK Math.

IV Sem	**Technical Skills-II**	Course Code: **V18CST61**	L	T	P
			0	0	4

Syllabus Details

Module-II: Problem Solving using C-II

1. Course Outcomes: After successful completion of the course, the student will be able to:

CO1 : Develop programs using Pointers. **[K3]**

CO2 : Develop problems using functions. **[K3]**

CO3 : Solve problems using recursions. **[K3]**

CO4 : Construct programs using File Handling. **[K3].**

CO5 : Develop programs using Structures and Unions **[K3].**

CO6 : Make use of command line arguments and preprocessors to solve the given problems(K3)

Syllabus

1. Pointers
2. **Functions and Pointers**
3. **Recursion**
4. **File Handling**
5. **Structures and Union**
6. **Enum, Preprocessors, Command Line Arguments**

Text Books:

1. Let us C: Yesvanth Kanetkar, BPB Publications, 16th Edition
2. Working With C, Yashavant P. Kanetkar, BPB Publications
3. Test Your C Skills, Yashavant P. Kanetkar, BPB Publications
4. Understanding Pointers in C, Yashavant P. Kanetkar, BPB Publications.

Appendix-CSE-05

II Sem	**Deep Learning**	Course Code: V18CTT19	L	T	P
			3	0	0

COURSE OUTCOMES:

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

CO1: Explain the concept of Neural Networks [**K2]**
CO2: Explain about Feed forward Networks [**K2]**
CO3: Explain the fundamentals of Deep Neural Networks [**K2]**
CO4: Explain about Recurrent Neural Networks [**K2]**
CO5: Explain Convolution Neural Networks [**K2]**

Unit I-Basics: Biological Neuron, Idea of computational units, McCulloch–Pitts unit and Thresholding logic, Linear Perceptron, Perceptron Learning Algorithm, Linear separability. Convergence theorem for Perceptron Learning Algorithm.

Unit-II Feed for ward Networks: Multilayer Perceptron, Gradient Descent, Back propagation, Empirical Risk Minimization, regularization, auto encoders.

Unit-III Deep Neural Networks: Difficulty of training deep neural networks, Greedy layer wise training. **Better Training of Neural Networks:** Newer optimization methods for neural networks : Ad grad, ad a delta, rms prop, adam, NAG.

Unit-IV Recurrent Neural Networks: Back propagation through time, Long Short Term Memory, Gated Recurrent Units, Bidirectional LSTMs, Bidirectional RNNs

Unit-V Convolution Neural Networks: LeNet, AlexNet. **Generative models:** Restrictive Boltzmann Machines (RBMs),

Textbooks

1. Deep Learning, Ian Goodfellow and YoshuaBengio and Aaron Courville, MIT Press, 2016. Available online at https://www.deeplearningbook.org/

References:

1. Neural Networks: A Systematic Introduction, Raúl Rojas, 1996
2. Pattern Recognition and Machine Learning, Christopher Bishop, 2007

COURSE STRUCTURE OF FIRST YEAR B.TECH (CST)

(For 2019 – 2020 Admitted Batch)

I SEMESTER

S.No	Course Code		Course Name	L	T	P	C
1	V18ENT01		English – I	2	-	-	MNC
2	V18MAT01	BSC	Engineering Mathematics – I	3	1	-	4
3	V18PHT02	BSC	Semiconductor Physics And Opto-Electronic Devices	3	1	-	4
4	V18EET01	ESC	Basic Electrical and Electronics Engineering	3	1	-	4
5	V18CHT02		Environmental Studies	3	-	-	MNC
6	V18ENL01		English Communication Skills Lab – I	-	-	2	MNC
7	V18MEL01	ESC	Engineering& IT Workshop	-	-	3	1.5
8	V18EEL01	ESC	Basic Electrical and Electronics Engineering Lab	-	-	3	1.5
9	V18PHL02	BSC	Semiconductor Physics And Opto-Electronic Devices Lab	-	-	3	1.5
Total				14	3	11	16.5

Total Contact Hours: 28

II SEMESTER

S. No	Course Code		Course Name	L	T	P	C
1	V18ENT02	HSS	English – II	2	-	-	2
2	V18MAT02	BSC	Engineering Mathematics – II	3	1	-	4
3	V18CHT01	BSC	Engineering Chemistry	3	1	-	4
4	V18CST01	ESC	Programming in 'C' for problem Solving	3	-	-	3
5	V18MET01	ESC	Engineering Graphics	1	-	3	2.5
6	V18ENL02	HSS	English Communication Skills Lab – II	-	-	2	1
7	V18CSL01	ESC	Programming Lab in 'C' for problem Solving	-	-	3	1.5
8	V18CHL01	BSC	Engineering Chemistry Lab	-	-	3	1.5
Total				12	2	11	19.5

Total Contact Hours: 25

Annexure-IX

Minutes of the meeting, BOS of Mechanical Engineering (Held on 21.04.2019)

Item No.1: Chairman welcomed all the BOS members and introduced to all the BOS-internal members.

Item No.2: Suggest modifications for the existing course structure.

- Course named Computer aided Engineering Drawing Practice (CAEDP) (course code. V18MEL04) is removed.
- Condition monitoring & Machine Learning (course code.V18MET44) and Entrepreneurship (Course code.V18MET45) are included under the group of Open Elective –III in VII semester.
- Few courses suggested during previous meeting are rearranged as mentioned follows:

S.No.	Code	Name of the Course	Planned	Revised plan
1	V18MET06	Theory of Machines-1	III Sem	IV Sem
2	V18MET09	Materials Engineering	IV Sem	III Sem
3	V18MET10	Metrology	IV Sem	VI Sem
4	V18MEL06	Metrology &Instrumentation & Control Systems lab	IV Sem	VI Sem
5	V18MET14	Manufacturing Processes	V Sem	IV Sem
6	V18MEL09	Heat Transfer lab	V Sem	VI Sem
7	V18MET17	Metal Cutting & Machine Tools	VI Sem	V Sem
8	V18MEL10	Thermal Engineering lab	VI Sem	V Sem
9	V18MEL11	Manufacturing Processes lab	VI Sem	IV Sem

- The revised course structure offered is attached in **Appendix-ME-01**.
- The courses Employability skills-I (course code.V18ENT03) & Employability skills - II (course code.V18ENT04) offered by BOS of English have been renamed as Professional Communication Skills-I (course code.V18ENT03) & Professional Communication Skills – II (course code.V18ENT04) in III and IV semesters respectively.
- The course code of Constitution of India V18ENT07 offered by BOS of English has been changed to V18ENT11 in IV semester.
- The approved courses syllabi for Professional Communication Skills – I (course code.V18ENT03) & Professional Communication Skills – II (course code.V18ENT04) is attached in **Appendix-ME-02**.

Item No. 2: Propose syllabi for the courses offered in III and IV semesters of B.Tech programme of Academic Year 2019-20.

- The approved syllabi for the courses is attached in **Appendix-ME-03**

Item No. 3: Review of the syllabi approved for the Academic Year 2018-19, I & II semester for B.Tech & M.Tech programme.

- No changes were suggested.

Appendix-ME-01

COURSE STRUCTURE OF FIRST YEAR B.TECH (ME)

III Semester						
S.No.	**Course Code**	**Course**	**L**	**T**	**P**	**Credits**
1	**V18MAT04**	Probability & Statistics	3	1	0	4
2	**V18MET03**	Engineering Mechanics	3	1	0	4
3	**V18MET04**	Thermodynamics	3	1	0	4
4	**V18MET05**	Fluid Mechanics & Fluid Machines	3	0	0	3
5	**V18MET09**	Materials Engineering	3	0	0	3
6	**V18MEL02**	Machine Drawing	0	0	3	1.5
7	**V18MEL03**	Fluid Mechanics & Fluid Machines Lab	0	0	3	1.5
8	**V18ENT03**	Professional Communication Skills-I	3	0	0	MNC
			18	**3**	**6**	**21**

Contact hours: 27

IV Semester						
S.No.	**Course Code**	**Course**	**L**	**T**	**P**	**Credits**
1	**V18MET07**	Applied Thermodynamics	3	0	0	3
2	**V18MET08**	Mechanics of Solids	3	1	0	4
3	**V18MET06**	Theory of Machines - I	3	0	0	3
4	**V18MET14**	Manufacturing Processes	3	0	0	3
5	**V18MET11**	Instrumentation & Control Systems	3	0	0	3
6	**V18MEL05**	Mechanics of Solids & Materials Engineering Lab	0	0	3	1.5
7	**V18MEL11**	Manufacturing Process Lab	0	0	3	1.5
8	**V18ENT11**	Constitution of India	2	0	0	MNC
9	**V18ENT04**	Professional Communication Skills-II	3	0	0	MNC
			20	**1**	**6**	**19**

Contact hours: 27

Appendix-ME-02

Professional Communication Skills - I

B.Tech III Semester

(Common to all Branches)

S.No	Course Code	Course Name	L	T	P	C
1	**V18ENT03**	**Professional Communication Skills - I**	3	-	-	MNC

Professional Communication Skills – II

B.Tech IV Semester

(Common to all Branches)

S.No	Course Code	Course Name	L	T	P	C
1	**V18ENT04**	**Professional Communication Skills - II**	3	-	-	MNC

Constitution of India

Year/Sem	ECE (III Sem) , CSE & ME (IV Sem)	**L**	**T**	**P**	**C**	**Course Code**
Regulation Year	2019-2020	2	-	-	MNC*	**V18ENT11**
Name of the Course	**Constitution of India**					
Branches	ECE, CSE & ME					

Syllabus for the Regulation Year 2019-2020 (Common to all Branches)

Professional Communication Skills - I

B.Tech III Semester

S.No	Course Code	Course Name	L	T	P	C
1	V18ENT03	**Professional Communication Skills - I**	3	-	-	MNC

COURSE OUTCOMES:

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

CO1: Summarize one's introduction in an appropriate manner, exhibit grammatical competence through correction of sentences, analyze noun and pronoun dispositions and develop pre-reading strategies to improve comprehension skills.[K5]

CO2: Distinguish singular and plural in different contexts and display knowledge through accurate usage of sentences, build conversations which befit the situations, comprehendthe passages well and, use different kinds of idioms. [K4]

CO3: Classify various kinds of adjectives and adverbs, learn natural occurrence of paired words of native speakers, infer the referential and inferential aspects of the passages and make use of idioms while narrating personal experiences. [K4]

CO4: Judge and assess the behaviour of people in day to day life using kinesics and proxemics that disclose their disposition and be aware of their personal traits that promote good relations. (K2)

CO5: Articulate their goals and have a constructive plan of executing them properly and become adept in oral presentations as well as poster presentations that enhance their professional skills. (K3)

CO6: Evaluate various happenings by thinking out of the box and display their latent talent. They can also reduce the stress levels by applying various stress management techniques. (K4)

UNIT – I

SELF-INTRODUCTION: Basic information- Academic and personal - interests– strengths and weaknesses – goal.

ERROR ANALYSIS: Nouns & Pronouns – Singular & Plural – Kinds of Nouns & Pronouns- Collective Nouns - Personal and Reflexive Pronouns.

READING COMPREHENSION: Reading as a skill – quick reading - analyzing – answering **IDIOMS& PHRASES**: Colloquial expressions– formal and informal expressions.

UNIT – II

ERROR ANALYSIS: Concord – Subject – Verb agreement.

ROLE PLAY: Day to day situations - practical approach – real life experiences.

READING COMPREHENSION: Skimming – scanning - summarizing – problem solving.

IDIOMS & PHRASES: Enriching written and spoken English – use and usage.

UNIT – III

ERROR ANALYSIS: Adjectives – Adverbs – role of modifiers – place of Adjectives– Adverbs of frequency.

COLLOCATIONS: Natural combination of words – closely affiliated with each other.

READING COMPREHENSION: At a glance – close reading – understanding – answering

IDIOMS & PHRASES: Communicative - expressive – competent.

UNIT -IV

INTER AND INTRA PERSONAL SKILLS: Leading, Coaching, Interviewing, Managing, Persuading - Self awareness, Self confidence, Good Attitude.

BODY LANGUAGE: Basics of proxemics and kinesics.

UNIT -V

PRESENTATION SKILLS: Importance of Presentation skills, Structuring our presentations, Ways to improve our presentation skills, Tips for effective presentations.– oral – Power point – poster.

GOAL SETTING: Short-term – long-term – aim – target – vision – How to set SMART goals.

UNIT - VI

LATERAL THINKING: What is creativity, Fundamental approaches to smart thinking, Characteristics of a creative person, Convergent and Divergent thinking.

STRESS MANAGEMENT: Meaning of Stress, Types of Stress, Symptoms of stress, Short term and long term stress, how can people manage stress.

References:

1. Essential English Grammar : Raymond Murphy
2. Advanced English Grammar : D.S. Paul
3. Word Power Made Easy : Norman Lewis
4. English collocations in use : Michael McCarthy
5. Word Power Made Handy : ShaliniVarma
6. Barron's GRE : Barron's
7. Current English Grammar & Usage : R.P Sinha
8. Think & Grow Rich : NapoleaonHill
9. Soft Skills for Everyone : Butterfield, Jeff,
10. Soft Skills : Chauhan,G.S.&Sangeeta Sharma
11. Theories of Personality : Hall, Calvin S
12. Corporate Conversations : Holtz, Shel
13. Communication Skills : Kumar, Sanajy and PushpLata
14. Winning at Interviews : Thorpe, Edgar and Showick Thorpe
15. Swami Vivekananda and "Personality Development" published by RK Math.

S.No	Course Code	Course Name	L	T	P	C
1	V18ENT04	**Professional Communication Skills - II**	3	-	-	MNC

COURSE OUTCOMES:

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

CO1: Correlate individual words into one whole sentence using new vocabulary and focus on the error analysis of prepositions and conjunctions. **[K4]**

CO2: Distinguish and acquire knowledge of using words of same category in a sentence and learn new words that promote communicative finesse.**[K5]**

CO3: Find errors in sentences where the modifiers are misplaced and put them at the appropriate place, use hit pair words and send an email that is concise and lucid **[K5]**

CO 4: Interpret the importance of Attire and Etiquette in societal context and manage their time. [**K2]**

CO5: Discover the team working abilities among themselves and display their leadership qualities. **[K3]**

CO6: Identify various elements of emotional balance that have positive impact on work-life-balance. **[K2]**

UNIT – I

ERROR ANALYSIS: Prepositions - kinds of prepositions –appropriate use - conjunctions –sub- ordinating– co-ordinating.

VOCABULARY: Etymology **–** roots – suffixes – prefixesand one word substitutes.

SENTENCE IMPROVEMENT: Better choice – error-free sentences – effective – syntax**.**

UNIT – II

ERROR ANALYSIS: Parallel grammatical forms – same grammatical structures.

VOCABULARY: Words that describe personalities – faiths – professions – medical specialistsand Word Clusters.

EXPANSION OF PROVERBS: Meaning – interpretation – explanation**.**

UNIT – III

ERROR ANALYSIS: Dangling modifiers – misplacement of modifiers – arrangement.

VOCABULARY: Antonyms and Synonymsand Foreign expressions.

EMAIL WRITING: Format – method of exchanging – technicalities.

UNIT- IV

ATTIRE & ETIQUETTE: Formal – informal- professional – social Attires, Meaning of Etiquette, Need for etiquette, Types of Etiquette.

TIME - MANAGEMENT: Value of time – Setting priorities – effective use of time – ABCD analysis, Pareto Principle, Eisenhower Method.

UNIT -V

TEAM WORK – Benefits of working with a team – Team Dynamics **.**

LEADERSHIP QUALITIES: Leadership Styles, Characteristics of a Good Leader, Big 5 Personality traits, Myths about leadership qualities.

UNIT -VI

EMOTIONAL INTELLIGENCE: What is EI – Daniel Goleman model of EI, Qualities of an Emotionally Intelligent Person - Emotional balance – feelings – thoughts – motivation.

WORK – LIFE - BALANCE: Personal life – professional life – cause of work-life imbalances, consequences of work-life imbalance, Role of gender and family – improving work life balance

References:

1. Essential English Grammar : Raymond Murphy
2. Advanced English Grammar : D.S. Paul
3. Word Power Made Easy : Norman Lewis
4. English collocations in use : Michael McCarthy
5. Word Power Made Handy : ShaliniVarma
6. Barron's GRE : Barron's
7. Current English Grammar & Usage : R.P Sinha
8. Think & Grow Rich : NapoleaonHill
9. Soft Skills for Everyone : Butterfield, Jeff,
10. Soft Skills : Chauhan,G.S.&Sangeeta Sharma
11. Theories of Personality : Hall, Calvin S
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13. Communication Skills : Kumar, Sanajy and PushpLata
14. Winning at Interviews : Thorpe, Edgar and Showick Thorpe
15. Swami Vivekananda and "Personality Development" published by RK Math.

Syllabus for the Regulation Year 2019-2020
Constitution of India
B.Tech ECE (III Sem), CSE & ME (IV Sem)

S.No	Course Code	Course Name	L	T	P	C
1	V18ENT11	**Constitution of India**	2	-	-	MNC

COURSE OUTCOMES:

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

CO1: Summarize the evolution and historical importance of Indian constitution from 1858 to 1947. **[K2]**

CO2: Explain various stages in the composition of Indian Constitution. **[K2]**

CO3: Develop awareness about their primary rights and duties & build up their civic sense. **[K3]**

CO4: Comprehend the distribution of powers between the center and states. **[K4]**

CO5: Summarize and sketch the specific roles of heads of Nation and the functioning of legislative bodies. **[K2]**

CO6: Explain the role of local self-government in strengthening democracy. **[K1]**

Unit-I

Historical Perspective of the Indian Constitution – A brief discussion of various Acts i.e from 1858 to 1947 passed by the British Government.

Unit–II

Constitution of India

d) Preparation of Indian constitution by Constituent Assembly of India.
e) Preamble or Philosophy of the Indian Constitution.
f) Salient features of the Indian constitution.

Unit-III

d) Fundamental Rights - their importance& Limitations
e) Fundamental Duties and their importance
f) Directive principles of the state policy and their implementation

Unit-IV

Indian Federalism

c) Distribution of powers between Union and State Governments
d) Legislative, Executive and Financial relations between Union and State Governments

Unit-V

Parliamentary form of Government in India

1. Union Executive

d) President of India- Powers and functions
e) Vice-President - Powers and functions
f) Prime Minister and Council of Minister - Powers and functions

2. Union Legislature

e) Rajya Sabha – Powers and Functions
f) Lok Sabha- Powers and Functions

g) Amending Procedure- Important Constitutional Amendments – 42nd, 44 Constitutional Amendment Acts.

3. Judiciary – Supreme court of India - Powers and Functions

Unit-VI

Local Self–government in India 73rd & 74th Constitutional Amendments Acts

Reference Books:

1. D D Basu-Introduction to the constitution of India – 18th Edition. Prentice – Hall of India Private Ltd-New Delhi-1998
2. Granville Austin (1972) the Indian Constitution, Cornerstone of a Nation Oxford university Press, New Delhi
3. Madhavkhosla (2012) the Indian Constitution, oxford university press, New Delhi
4. 4.Granville Austin (1999) Working a Democratic Constitution; A History of the Indian Experience, Oxford University Press, New Delhi
5. Zoya Hasan, Sridharan E and Sudharshan R (Eds) 2002 India's living Constitution, Permanent black, New Delhi
6. BaxiUpendra (1980) the Indian Supreme Court and Politics Eastern book co, Lucknow

Appendix-ME-03

V18MET04	THERMODYNAMICS	L	T	P	C
		3	1	0	4

COURSE OUTCOMES:

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

		Knowledge Level
CO1	Describe the basic terms related to work and heat	K2
CO2	Explain first law of thermodynamics and internal energy.	K2
CO3	Apply the second law of thermodynamics to basic thermal systems.	K3
CO4	Explain the concept of entropy.	K2
CO5	Illustrate various thermodynamic cycles.	K2
CO6	Discuss about pure substance.	K2

UNIT – I

Thermodynamic System, boundary, Surrounding, control volume, Universe, Concept of Continuum, Thermodynamic Equilibrium, State, Property, Process, Cycle – Reversibility – Quasi – static Process, Irreversible Process, Causes of Irreversibility – Energy in State Work and Heat, Point and Path function. Zeroth law of thermodynamics.

UNIT – II

First law of thermodynamics: Joule's experiments-First law of thermodynamics-systems and steady flow systems- Specific heats at constant volume and pressure - Enthalpy- First law applied to flow systems- Systems undergoing a cycle and change of state- First law applied to steady flow processes-various non-flow processes-Properties of end states- Heat transfer and work transfer- Change in internal energy-throttling and free expansion.

UNIT – III

Second law of thermodynamics-Limitations of the First Law – Thermal Reservoir, Heat Engine, Heat pump, Parameters of performance, Second Law of Thermodynamics, Kelvin-Planck and Clausius Statements and their Equivalence / Corollaries, PMM of Second kind, Carnot's principle, Carnot cycle and its specialties, Clasius theorem Clausius Inequality.

UNIT – IV

Entropy, Principle of Entropy Increase, availability and irreversibility–Third Law of Thermodynamics

T-ds relations, Helmholtz and Gibbs functions, Gibbs relations, Maxwell relations

UNIT – V

Thermodynamic Cycles: Carnot vapor cycle, ideal Rankine cycle, Rankine reheat cycle, air-standard Otto cycle, air-standard Diesel cycle, air-standard Brayton cycle, vapor-compression refrigeration cycle.

UNIT – VI

Pure Substances: P-V-T- surfaces, T-S and h-s diagrams, Mollier Charts, Phase Transformations, Triple point at critical state properties during change of phase, Dryness Fraction.

Text Books:

1. Engineering Thermodynamics, PK Nag 5th Edn, TMH,2014
2. Thermodynamics. An engineering Approach with student resources DVD Y.A. Cengel & M.A. Boles, 7th Edn-McGrawHill,2014
3. Internal Combustion Engine –V Ganeshan.4th edition, TMH, 2016

References:

1. Engineering Thermodynamics by Y.V.C. Rao, 1st edition, Universities, 2005.
2. A text book of Engineering thermodynamics, R.K Rajput, 4th edition, Lakshmi Publishers,2010

V18MET05	FLUID MECHANICS AND FLUID MACHINES	L	T	P	C
		3	0	0	3

COURSE OUTCOMES:

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

		Knowledge Level
CO1	Understand the basic concepts of fluid properties and to determine hydrodynamic forces on submerged bodies.	K3
CO2	Apply the flow field phenomena and the basic governing equations in solving fluid flow problems.	K3
CO3	Calculate the various losses occurring when the fluid flowing in closed conduit and measure the discharge by different apparatus.	K3
CO4	Understand the concept of boundary layer theory and to find out major and minor losses.	K3
CO5	Determine the forces in the operation of jets and turbines and to determine efficiencies of turbines.	K3
CO6	Interpret the operation of pumps and hydraulic systems and to find efficiencies of pumps.	K3

UNIT 1

Fluid Statics :Dimensions and units-Physical properties of fluids-Density, Specific gravity, Viscosity, Surface tension, Vapour pressure, Capillarity, Bulk modulus. Pressure types-Atmospheric, absolute, gauge and vacuum pressure. Measurement of pressure - Piezometer, different types of manometers.

UNIT 2

Fluid Kinematics: stream line, path line and steak line. Classification of flows-steady &un steady, uniform & non uniform, laminar & turbulent, rotational & irrotational flows-equation of continuity for one dimensional flow and three dimensional flow. Equation of continuity in differential form.

UNIT 3

Fluid Dynamics: Bernoulli's equation along a stream line, Momentum equation, application of momentum equation on pipe bend. Measurement of flow- Pitot tube, Venturimeter, Orifice meter, Turbine flow meter.

UNIT 4

Closed Conduit Flow: Reynolds experiments, Darcy-Weisbatch equation, Major and minor losses, Hydraulic gradient line, Total energy line, Pipes in series and parallel.

Boundary layer concepts: Definition, Development along a thin flat plate, Thicknesses (Momentum, Energy, Displacement-No derivations), separation, methods of controlling separation, stream lined and bluff bodies.

UNIT 5

Basics of turbomachinery: Determination of hydrodynamic force of jet on stationary and moving flat, inclined, curved vanes (jet striking at tip and centre), velocity diagrams, work done and efficiency, flow over radial vanes, series of vanes.

Turbines:

Classification of turbines, Pelton wheel, Francis turbine, Kaplan turbine- Working principles, working proportions, work done, efficiencies. Draft tube-types, functions and efficiency.

Unit and specific quantities, governing, Cavitation, Water hammer, Surge tank.

UNIT 6:

Pumps :

Centrifugal pumps: Classification, working, work done, heads, efficiencies, losses. Specific speed, pumps in series and parallel.

Reciprocating pumps: Classification, working, work done, slip, indicator diagrams, Effect of acceleration and friction on work done.

TEXT BOOKS:

1. Hydraulics And Fluid Mechanics Including Hydraulics Machines (In Si Units)– Modi & Seth,20th edition, Standard publishers, 2015.
2. Fluid mechanics and Hydraulic machines – R.K. Bansal,1st edition, Lakshmi Publications,2011

REFERENCES:

1. Fluid Mechanics And Fluid Power Engineering, D.S Kumar, 9th edition, , S.K Kataria publishers, 2016
2. Fluid Mechanics and Hydraulics by Jack.B. Evett –,3rd edition, TMH, 2004
3. Fluid Mechanics – Yunus A.Cengel & John.M.Cimbala,2nd edition, TMH publications, 2013

V18MET09	MATERIALS ENGINEERING	L	T	P	C
		3	0	0	3

COURSE OUTCOMES:

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

		Knowledge Level
CO1	Explain the types of bonds in solids and crystallization of metals.	K2
CO2	Construct phase diagrams for the study of alloys and phase transformation reactions.	K2
CO3	Distinguish Cast Irons and Steels.	K2
CO4	Identify suitable heat treatment process to achieve desired properties of metals and alloys.	K2
CO5	Discriminate different non ferrous metals and their alloys	K2
CO6	Illustrate the properties and applications of composites and ceramic materials and understand the concepts of powder metallurgy.	K2

Unit 1

Structure of Metals: Properties of metals, Types of Bonds in Solids, Crystal geometry - Space Lattices, Unit cells, Crystal Structure, Miller indices. Imperfections in crystals- Line defects, Point defects, Surface defects. Crystallization of metals, grain, grain boundaries and their properties.

Constitution of alloys: Necessity of alloying, types of solid solutions, Hume Rotherys rules.

Unit 2

Equilibrium Diagrams: Experimental methods of construction of equilibrium diagrams, phase rule, Isomorphous alloy systems, Lever rule, eutectic systems, peritectic reaction. Transformations in the solid state – allotropy, eutectoid, peritectoid reactions, relationship between equilibrium diagrams and properties of alloys. Study of important binary phase diagrams of Cu-Ni, Al-si, and Fe-Fe3C.

Unit 3

Production of Iron & Steels: Working principle of Blast Furnace, Cupola furnace, Open hearth furnace , Electric arc furnace and Induction furnace.

Cast irons and alloy steels: Types of Cast irons- White, Grey, Malleable and Nodular Cast Irons, Properties and application of cast irons, Effect of alloying elements on structure and properties of steels , Properties and uses of Silicon and Hadfield Manganese steels, High speed steels and Stainless steel.

Unit 4

Heat treatment of Ferrous and Non Ferrous alloys: Types of heat treatment processes, Annealing, normalizing, hardening, TTT diagrams, tempering, hardenability, surface - hardening methods, Age hardening treatment.

Unit 5

Non-ferrous metals and alloys: Properties and uses of important non-ferrous metals like Cu, Al, Pb, Sn, Zn. Study of important non-ferrous alloys: Brass & Bronzes, Bearing alloys, Al alloys & Ti alloys.

Unit 6

Composite materials and Ceramics: Classification of composites, methods of manufacturing of composites – stir casting method, hand layup process, filament winding process.

Properties and applications of crystalline ceramics, glasses, cermets, abrasive materials and nano-materials

Powder metallurgy: Introduction, steps in powder metallurgy.

TEXT BOOKS:

1. Introduction to Physical Metallurgy/ Sidney H. Avner/ 2nd edition ,McGraw Hill Education (India) Private Limited/2016
2. Materials Science and Engineering/ William D Callister (Adapted by R. Balasubramaniam) /Wiley Inida (P) Ltd/ 2007
3. Material Science and Metallurgy/ Dr. V.D.Kodgire/40th edition, Everest Publishing House/2017

REFERENCE BOOKS

1. Materials Science and Engineering/ V. Raghavan /(5th Edition) Prentice-Hall of India Pvt. Ltd/2004.
2. Essential of Materials science and engineering /Donald R.Askeland/ 2nd edition Thomson/2014
3. Engineering mechanics of Composite Materials/Isaac M.Daniel, Ori Ishai/ 5th edition/Oxford Publications/2015.

V18MEL02	MACHINE DRAWING	L	T	P	C
		0	0	3	1.5

COURSE OUTCOMES:

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

		Knowledge Level
CO1	Describe the drawing and develop ability to represent any matter/symbol with the help of picture in CAD.	K2
CO2	Develop primary knowledge on machine drawings and the representation of tolerance on dimensions.	K3
CO3	Show the hidden objects by sectional views of different machine parts and their geometry representation.	K3
CO4	Identify the different joining methods to assemble the machine parts .	K3
CO5	Develop skill to produce assembly drawings from detailed drawings of machines parts.	K3
CO6	Construct press tools and their assemblies in 3-D.	K3

PART-A

Sectional views : Orthographic projection of different types of composite bodies. Sectional views, Full sectional, half sectional views of simple machine parts, Screwed fastenings – nomenclature of threads, conventional representation of threads, Hexagonal and square headed bolts and nuts, Various types of machine screws and set screws, Foundation bolts.

Keys, Shaft couplings, Riveted joints, Bearings Sunk key, saddle key, feather key, sleeve coupling, flanged coupling, lap and but riveted joints and plummer block,Lock nuts, Cotter joints

PART-B

AutoCAD Mechanical Desktop, draw, modify, dimension tool bars, annotations, Layers,ISI conventions in drawing, representation of Materials, machine parts, welded joints, riveted joints, methods of indicating notes on drawings. Sketcher, part modeling, assembly, drafting commands in CATIA.

Assembly drawings in 2D using AUTOCAD: Stuffing box, steam engine connecting rod, Eccentric, single tool post, Lathe tail stock, machine vice, knuckle joint and Screw jack.

Assembly drawings in 3D Using CATIA: Foot step bearing, square tool post, piercing and blanking tool, V-bending tool and box jig.

TEXT BOOKS:

1.Machine drawing _ K.L. Narayana, P. Kannaiah& K.Venkata reddy, 1st edition, Radiant, 2016

2.Tool Engineering & Design _ G.R. Nagpal/Khanna publishers, 1st edition, Khanna Publishers,2009

3.Machine Drawing with Auto CAD- Pohit and Ghosh, 1st edition, Pearso, 2017

REFERENCES:

1. Machine Drawing by Nagpal,1st edition, khanna publishers, 2009
2. Machine drawing, Ajeet Singh, 2nd edition, TMH, 2016
3. Machine drawing with autocad, Pohit; Goutam, 1st edition, Pearson, 2017.

V18MEL03	FLUID MECHANICS AND FLUID MACHINES LAB	L	T	P	C
		0	0	3	1.5

COURSE OUTCOMES:

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

		Knowledge Level
CO1	Employ the basic principles of Fluid mechanics to assess discharge with different devices and different losses in a pipe line.	K3
CO2	Calculate the performance parameters of Reciprocating and Centrifugal pumps.	K3
CO3	Calculate the performance parameters of different types of turbines.	K3

1. Determination of friction factor for the given pipe line.
2. Determination of loss of head due to sudden contraction.
3. Determination of force exerted by a jet on a vane.
4. Calibration of Venturimeter.
5. Calibration of Orificemeter.
6. Calibration of Turbine flow meter.
7. Determination of performance parameters of Reciprocating pump.
8. Determination of performance parameters of Single stage Centrifugal pump.
9. Determination of performance parameters of Multi stage Centrifugal pump.
10. Determination of performance parameters of Pelton wheel.
11. Determination of performance parameters of Francis Turbine.
12. Determination of performance parameters of Kaplan Turbine.

ADD ON EXPERIMENTS:

1. Determination of loss of head due to sudden expansion.
2. Verification of Bernoulli's theorem.

REFERENCES:

1. Fluid Mechanics and Fluid Machines lab – College lab manual.
2. Hydraulics And Fluid Mechanics Including Hydraulics Machines (In Si Units) – Modi & Seth,20th edition, Standard publishers, 2015.

V18MET07	APPLIED THERMODYNAMICS	L	T	P	C
		3	0	0	3

COURSE OUTCOMES:

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

		Knowledge Level
CO1	Illustrate the working of various IC engines.	K2
CO2	Classify the working of various steam boilers, mountings, accessories and draught systems.	K2
CO3	Demonstrate about steam nozzles	K2
CO4	Calculate the performance of steam turbines	K3
CO5	compute the performance of steam condensers	K3
CO6	Illustrate the performance parameters of gas turbines	K3

UNIT – I

I. C. ENGINES : Classification, Working principles, Valve and Port Timing Diagrams, Engine systems, Fuel, Carburettor, Fuel Injection System, Ignition, Cooling and Lubrication, principle of wankle engine.

UNIT – II

Steam boilers

Classification, working principles of L.P & H.P boilers with sketches & applications, mountings and accessories, working principles, boiler horse power, Process Steam, equivalent evaporation, efficiency and heat balance, draught, classification- natural and artificial draught.

UNIT – III

Steam Nozzles:

Type of nozzles- Applications - Flow through nozzles- Condition for maximum discharge- Nozzle Efficiency- Super saturated flow in nozzles, Wilson's line.

UNIT – IV

Steam Turbines: Classification, Applications, impulse turbine, mechanical details, velocity diagram, effect of friction, power developed, axial thrust, blade or diagram efficiency, condition for maximum efficiency, velocity compounding, pressure compounding and velocity & pressure Compounding, combined velocity diagram for a velocity compounded impulse turbine.

Reaction Turbine: Applications , Mechanical details, principle of operation, thermodynamic analysis of a stage, degree of reaction, velocity diagram, Parson's reaction turbine, condition for maximum efficiency.

UNIT – V

Steam Condensers:

Classification of condensers- Jet, Evaporative and surface condensers-Applications - Vacuum and its Measurement- Vacuum efficiency- Sources of air leakage in condensers- Condenser Efficiency- Daltons law of partial pressures- Determination of mass of cooling water.

UNIT – VI

Gas Turbines: Applications, Simple gas turbine plant, ideal cycle, essential components, parameters of performance, actual cycle, regeneration, inter cooling and reheating, closed and open cycles, merits and demerits.

Text Books:

1. Engineering Thermodynamics, PK Nag 4th Edn, TMH.
2. Thermodynamics. An engineering Approach with student resources/ DVD. Y.A. Cengel & M.A. Boles/ 8th Edn-McGrawHill/2016
3. Gas Turbines / V Ganesan/3rd edition, TMH/2016

References:

1. Thermal Engineering/ R.K.Rajput/4th edition/ Laxmi Publications/2010
2. Applied Thermodynamics-II / R. Yadav./6th edition, Central Publishing House/2016
3. Gas turbines and Propulsive Systems/1st edition, Dhanpat Rai/2014
4. Tables of the properties of steam and other vapours and temperature-Entropy table by Cecil H Peabody by Forgotten books
5. Steam tables by C.P Kodandaraman – New age International

V18MET08	MECHANICS OF SOLIDS	L	T	P	C
		3	1	0	4

COURSE OUTCOMES:

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

		Knowledge Level
CO1	Explain concept of stress and strain of composite bars.	K2
CO2	Find the shear force and bending moment in a beams.	K3
CO3	Calculate flexural and shear stresses in a beam and understand applications of various springs.	K3
CO4	Estimate the principal stresses in structural members.	K3
CO5	Determine the torsional rigidity of shaft and buckling load capacity of columns.	K3
CO6	Estimate the hoop and longitudinal stress and strains in thin and thick cylinders.	K3

UNIT-I Simple stresses & Strains:

Definitions of stress and strain – types of stresses and strains – Elasticity – Hooke's law – Stress – Strain diagram for Mild steel – working stress- factor of safety- Lateral strain – Poisson's ratio and volumetric strain – Elastic Modulii and the relationship between elastic constants – Bars of varying section – composite bars – temperature stresses.

Strain Energy

Definition – Resilience – Strain Energy due to gradually applied; suddenly applied and impact loads – simple applications.

UNIT-II Shear Force & Bending Moment Diagrams:

Definition of beam – Types of beams – concept of SF and BM – SF &BM diagrams for cantilever, Simple support and overhanging beams subjected point loads, Uniform distributed load(UDL), Uniformly varying loads– point of contra flexure – Relationship between S.F, BM and rate of loading.

UNIT-III Flexural Stresses:

Theory of simple Bending – Assumptions–Derivation of Bending equation - Neutral axis – Determination of bending stresses – section modulus of rectangular, Circular sections (Solid and Hollow), I and T channel sections.

Mechanical Springs: Introduction , classification , Applications **,** Stresses and deflections of helical springs – extension -compression springs .

UNIT-IV Principal Stresses and Strains:

Introduction-stresses on an inclined section of a bar under axial loading- compound stresses-Normal and tangential stresses on an inclined plane for biaxial stresses-Two perpendicular normal stresses –representation of stress on Mohrs circle diagram, Introduction to theories of Failure.

UNIT-V

TORSION: Introduction- Derivation of torsion equation and its assumptions. Applications of the equation of the hollow and solid circular shafts, torsional rigidity. Combined torsion and bending of circular shafts.

COLUMNS: Buckling and Stability, Columns with Pinned ends, Columns with other support Conditions, Limitations of Euler's Formula, Rankine'sFormula.

UNIT-VI

THIN CYLINDERS: Thin seamless cylindrical shells – Derivation of formula for longitudinal and circumferential stresses – hoop, longitudinal and Volumetric strains – changes in dia, and volume of thin cylinders – Riveted boiler shells – Thin spherical shells.

THICK CYLINDERS: –lame's equation – cylinders subjected to inside & outside pressures –compound cylinders.

Text Books:

1. Solid Mechanics, by Popov/PHI publications 2nd edition /2017
2. Mechanics of Materials/Gere and Timoshenko,/ TMH 4th edition /2010
3. Strength of materials/ S.Ramamrutham/Dhanpat rai publishers 1st edition /2016

Reference Books:

1. Strength of materials/ R.K.Bansal/ Laxmi Publications 5th edition /2017
2. Introduction to Solid Mechanics / Irving H Shames/ 4th edition PEARSON /2014
3. Strength of materials /Young,D.H. Timoshenko, Stephen/CBS publishers /2002

V18MET06	THEORY OF MACHINES-I	L	T	P	C
		3	0	0	3

COURSE OUTCOMES:

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

		Knowledge Level
CO1	Explain the inversion of the four bar, slider crank and double slider chains.	K2
CO2	Determine the velocities and accelerations in mechanisms by graphical method.	K3
CO3	Explain the working of copying mechanism, straight line motion mechanisms, steering gears and Hooke's joint.	K2
CO4	Draw the cam profiles for given follower motions.	K3
CO5	Compare tooth profiles for gears and compute performance characteristics.	K2
CO6	Describe gear trains and compute the velocity ratio and torque in gear trains and calculate various parameters related to belts.	K3

UNIT-I

Mechanisms :

Introduction, terminology, definitions and assumptions, planar, spherical and spatial mechanisms, mobility, classification of mechanisms, kinematic inversion, inversions of four bar chain, slider crank chain and double slider chain, Grashoff's law, mechanical advantage.

UNIT-II

Velocity Analysis :

Introduction, Absolute and relative motions, Vectors, Addition and subtraction of vectors, Motion of a link, Four-link mechanism, Velocity diagrams, Angular velocity of links, Velocity of rubbing, Slider-crank mechanism, crank and slotted lever mechanism. Instantaneous center, Kennedy's theorem, Locating I-centers, Angular velocity ratio theorem.

Acceleration Analysis:

Introduction -Acceleration, four-link mechanism, Acceleration of intermediate and offset points, Slider-crank mechanism, Coriolis component, Crank and slotted lever mechanism using graphical method, Klein's Construction.

UNIT-III

Lower Pairs: Pantograph, Exact straight line mechanism condition, Peaucellier, Hart Scott-

Russel mechanisms. Approximate straight line mechanisms, Grasshopper, Watt, Chebyshev, Robert mechanisms. Steering gears-condition for correct steering, Davis, Ackerman steering gears, Hooke's joint-velocity ratio, angular acceleration of driven shaft, double Hooke's joint.

UNIT-IV

Cams: Types of cams and followers, types of follower motion, velocity and acceleration diagrams, profile of cams.

UNIT-V

Gears: Classification of gears, spur gears- terminology, fundamental law of toothed gearing, involute and cycloidal profile, Path of contact ,arc of contact, contact ratio, minimum number of teeth, interference and methods of avoiding interference, rubbing velocity.

UNIT-VI

Gear Trains: Introduction – Types – Simple – compound and reverted gear trains – Epicyclic gear train.

Belt drives: Belt and rope drives, open and crossed belt drives, velocity ratio, slip, material for belts and ropes, crowning of pulleys, ratio of friction tensions, power transmitted, centrifugal effect on belts, maximum power transmitted by a belt, initial tension.

Text Books:

1. Theory of Machines' Rattan SS, Tata McGraw Hill Education Publishers, 4th Edition 2015.
2. Theory of Machines / Beven Thomos / CBS publication, 3rd edition /2005

References:

1. Theory of Machines / R.K.Bansal/ Laxmi Publications 5th edition /2016
2. Mechanisms of Machines, V Ramamurthy, Narosa publishing House, Reprint ,2019
3. Theory of Machines by R S KHURMI, S CHAND Publications, 1st Edition, 2011.
4. Theory of Machines and Mechanisms, Ballaney P, Khanna publications,1st Edition,2011.

V18MET14	MANUFACTURING PROCESSES	L	T	P	C
		3	0	0	3

COURSE OUTCOMES:

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

		Knowledge Level
CO1	Understand fundamentals of casting-patterns and its materials, Gating System	K3
CO2	Choose the elements of casting and introduce other casting processes	K3
CO3	Distinguish various arc and solid state welding processes and select a suitable process based on the application and requirements	K3
CO4	Understand the principles of advanced welding processes and their applications, welding defects and its testing methods	K3
CO5	Establish the knowledge on Hot working and Cold Working Process	K3
CO6	Understanding of various bulk forming processes, sheet metal forming and processing of plastics.	K3

Unit I:

Casting - Steps involved in making a casting – Advantage of casting and its applications.

Patterns and Pattern making – Types of patterns – Materials used for patterns, pattern allowances and their construction

Principles of Gating_ Gating ratio and design of Gating systems

Unit II:

Melting and solidification:

Methods of melting -- Crucible melting and cupola operation, steel making processes.

Solidification of casting – Concept – Solidification of pure metal and alloys, short & long freezing range alloys.

Risers – Types function and design, casting design considerations,

Special casting processes -- 1) Centrifugal 2) Die 3) Investment.

Unit III:

Welding: Classification of welding process types of welds and welded joints and their characteristics, design of welded joints --Gas welding, ARC welding, Forge welding, resistance welding, Thermit welding and Plasma (Air and water) welding.

Unit IV:

Special welding processes

Inert Gas welding - TIG & MIG, welding, Friction welding, Induction welding, Explosive welding, Laser welding, Soldering & Brazing. Heat affected zones in welding; welding defects – causes and remedies – destructive non-destructive testing of welds.

Cutting of metals: Oxy – Acetylene Gas cutting, water plasma. Cutting of ferrous, non-ferrous metals.

Unit V:

Hot & cold working: strain hardening, recovery, recrystallization and grain growth, Comparison of properties of Cold and Hot worked parts

Rolling fundamentals – Theory of rolling, types of Rolling mills and products.

Extrusion of metals: Basic extrusion process and its characteristics. Hot extrusion and cold extrusion - Forward extrusion and backward extrusion – Impact extrusion Hydrostatic extrusion.

Drawing – Wire drawing and Tube drawing

Unit VI:

Bulk forming processes: Principles of forging – Tools and dies – Types Forging – Smith forging, Drop Forging – Roll forging – Forging hammers: Rotary forging – forging defects.

Sheet metal forming: Stretch Forming, Deep Drawing, Coining, Spinning, Blanking And Piercing – Bending And Forming, Stamping Spring Back And Remedies - Types Of Presses And Press Tools

Processing of plastics: Types of Plastics, Properties, applications and their Processing methods & Equipment (blow &injection moulding)

Text Books:

1. Manufacturing Engineering and Technology/ Kalpakjian, Serope;Steven, Schmid R./Pearson, 1st Edition 2013.
2. Manufacturing Technology / P.N. Rao/ Tata McGraw Hill, 4th Edition 2016.

References:

1. Production Technology / R.K. Jain /Khanna publishers,17th edition 2004.
2. Principles of Metal Castings / Richard W Heine and Roenthal. McGraw Hill Education, 2nd Edition 2017.
3. Welding Process and technology /Dr. Paramar / Khanna Publishers,3rd Edition.
4. Production Technology /Sarma P C / S.Chand Publications,4th Edition 2014.

V18MET11	INSTRUMENTATION AND CONTROL SYSTEMS	L	T	P	C
		3	0	0	3

COURSE OUTCOMES:

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

		Knowledge Level
CO1	Discuss about the basic concepts of Linear measuring Instruments	K2
CO2	Explain various types of Temperature and Pressure measuring Instruments	K2
CO3	Understand the working of flow, Speed, Acceleration and Vibration measuring devices	K2
CO4	Illustrate various types of Strain measuring Instruments	K2
CO5	Explain the Humidity, Force, Torque, and Power measuring Instruments	K2
CO6	Describe various types of control system and its Elements	K2

UNIT – I

Basic principles of measurement – Generalized configuration, Dynamic performance characteristics – sources of error and elimination methods.

Displacement Measurement: Principle and construction of various transducers – piezo electric, inductive, capacitance, resistance, ionization and photo electric transducers, calibration procedures.

UNIT – II

Temperature Measurement : Thermometry , scales of temperature, electrical resistance – thermister – thermocouple – pyrometers.

Pressure Measurement : Working of Various instruments - dead weight pressure gauge , bourdon pressure gauges, bellows – diaphragm gauges.

Low pressure measurement – Thermal conductivity gauges – Ionization pressure gauges, Mcleod pressure gauge.

UNIT – III

Level Measurement : Working of Various instruments – Capacitative, Ultrasonic, Magnetic, Cryogenic fuel level indicators – bubler level indicators.

Flow Measurement- Rotameter, Magnetic, Ultrasonic, hot – wire anemometer, Laser Doppler Anemometer (LDA).

Speed Measurement : Types of Mechanical tachometers, electrical tachometers, stroboscope and noncontact type of tachometer

UNIT – IV

Acceleration And Vibration Measurement: Principles of seismic instruments – Vibrometer and Accelerometer

Strain Measurements: Various types of strain measuring instruments – electrical strain gauge – gauge factor – use of resistance strain gauge for measuring bending compressive and tensile strains , strain gauge rosettes.

UNIT – V

Introduction to Elements Of Control Systems : classification, Elements of control systems, concept of open loop and closed loop systems, Examples and application of open loop and closed loop systems, Feed-Back Characteristics.

UNIT – VI

Control Systems Components: Servomechanisms- Transfer Function of DC Servo motor and AC Servo motor,working principle of stepper motor, applications (position, temperature and speed control systems with block diagrams).

Microprocessor and Microcontrollers : Introcution,basic concepts and various types controllers

Text Books:

1. Measurement Systems: Applications & design / D.S Kumar/ Metropolitan/1st/2015
2. Mechanical Measurements / BeckWith, Marangoni,Linehard/ Pearson/6th/2018

References:

1. Measurement systems: Application and design/Doeblin Earnest. O. Adaptation/ TMH/6th edition,
   2018
2. A course in mechanical measurements and Instrumentation and control/
3. Sawhney, A.K.;Sawhney, Puneet/ Dhanpat Rai/1st edition/2016
4. Experimental Methods for Engineers / J.P.Holman/McGraw Hill /8th edition.
5. Mechanical and Industrial Measurements / R.K. Jain/ Khanna Publishers/2008

V18MEL05	Mechanics of Solids & Materials Engineering Lab	L	T	P	C
		0	0	3	1.5

COURSE OUTCOMES:

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

		Knowledge Level
CO1	Assess the Mechanical properties of different metals.	K3
CO2	Examine the microstructures of different ferrous and non ferrous metals.	K3
CO3	Identify the effect of heat treatment and cooling rates on the properties of steels.	K4

NOTE: Any 6 experiments from each section A and B.

(A) MECHNICS OF SOLIDS LAB:

1. Direct tension test
2. Bending test on

a) Simply supported beam

b) Cantilever beam

3. Torsion test
4. Hardness test

a) Brinells hardness test

b) Rockwell hardness test

5. Test on springs
6. Compression test on cube
7. Impact test
8. Punch shear test

(B) METALLURGY LAB:

1. Preparation and study of the Micro Structure of pure metals like Iron, Cu and Al.
2. Preparation and study of the Microstructure of Mild steels, Medium carbon steels, high – C steels.
3. Study of the Micro Structures of Cast Irons.
4. Study of the Micro Structures of Non-Ferrous alloys – Brass and Bronze.
5. Study of the Micro structures of Heat treated steels.
6. Hardenability of steels by Jominy End Quench Test.
7. To find out the hardness of various treated and untreated steels.

References:

1. Strength of materials, S.S.Bhavikatti Vikas Publications, 4th edition, 2013.
2. Material Science and Metallurgy, Dr. V.D.Kodagire, Everest Publishing House, 40 th Edition, 2017.

V18MEL11	MANUFACTURING PROCESSES LAB	L	T	P	C
		0	0	3	1.5

COURSE OUTCOMES:

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

		Knowledge Level
CO1	Design and Make a pattern.	3
CO2	Test the properties of sand and prepare a casting.	3
CO3	Perform Arc welding, Spot welding, TIG, MIG welding and Plasma Arc Cutting operations	3
CO4	Perform blanking, piercing, Drawing and bending operations.	3
CO5	Operate injection and blow moulding machines to manufacture plastic components	3

METAL CASTING:

Pattern Design and pattern making using wood turning lathe
Sand properties testing for Compression strength and permeability.
Mould preparation, melting and casting.

WELDING:

ARC Welding Lap, Butt & T- Joint
Spot Welding –Lap &Butt Joint
TIG Welding -Butt Joint
MIG Welding- Butt Joint
Plasma Arc Cutting

METAL FORMING:

Blanking & Piercing operation by using Progressive Die
Bending and Drawing operation

PROCESSING OF PLASTICS

Injection Molding
Blow Molding

REFERENCES:

1. Production technology lab – college manual.
2. Manufacturing Engineering and Technology/ Kalpakjian, Serope; Steven, Schmid R. / Pearson, 1st Edition, 2013
3. Manufacturing Technology / P.N. Rao/TMH, 4th Edition, 2016.

Annexure-X

Academic Calendars for B.Tech, MBA & M.Tech (for the A.Y.2018-19)

B.Tech

I Semester			
Description	**From**	**To**	**Weeks**
Commencement of Class Work	03-08-2018		
I Unit of Instructions	03-08-2018	28-09-2018	8 Weeks
I Mid Examinations	29-09-2018	03-10-2018	5 Days
II Unit of Instructions	04-10-2018	29-11-2018	8 Weeks
II Mid Examinations	30-11-2018	03-12-2018	4 Days
Comprehensive Test	04-12-2018	10-12-2018	1 Week
Preparation & Practical's	11-12-2018	15-12-2018	5 Days
End Examinations	17-12-2018	22-12-2018	1 Week
II Semester			
I Unit of Instructions	02-01-2019	27-02-2019	8 Weeks
I Mid Examination	28-02-2019	05-03-2019	5 Days
II Unit of Instructions	06-03-2019	01-05-2019	8 Weeks
II Mid Examinations	02-05-2019	07-05-2019	5 Days
Comprehensive Test	08-05-2019	13-05-2019	5 Days
Lab Examinations	14-05-2019	18-05-2019	5 Days
End Examinations	20-05-2019	31-05-2019	2 Weeks

MBA

I Semester			
Description	**From**	**To**	**Weeks**
Commencement of Class Work	13-08-2018		
I Unit of Instructions	13-08-2018	06-10-2018	8 Weeks
I Mid Examinations	08-10-2018	11-10-2018	4 Days
II Unit of Instructions	12-10-2018	06-12-2018	8 Weeks
II Mid Examinations	07-12-2018	11-12-2018	5 Days
Preparation & Practical's	12-12-2018	15-12-2018	4 Days
End Examinations	17-12-2018	22-12-2018	1 Week
II Semester			
I Unit of Instructions	07-01-2019	02-03-2019	8 Weeks
I Mid Examinations	05-03-2019	13-03-2019	8 Days
II Unit of Instructions	14-03-2019	08-05-2019	8 Weeks
II Mid Examinations	09-05-2019	17-05-2019	8 Days
End Examinations	20-05-2019	05-06-2019	2 Weeks
Project period	10-06-2019	13-07-2019	5 Weeks

M.Tech

I Semester			
Description	**From**	**To**	**Weeks**
Commencement of Class Work	28-08-2018		
I Unit of Instructions	28-08-2018	23-10-2018	8 Weeks
I Mid Examinations	24-10-2018	26-10-2018	3 Days
II Unit of Instructions	27-10-2018	22-12-2018	8 Weeks
II Mid Examinations	24-12-2018	27-12-2018	3 Days
Preparation & Practical's	28-12-2018	01-01-2019	4 Days
End Examinations	02-01-2019	08-01-2019	1 Week
II Semester			
I Unit of Instructions	21-01-2019	16-03-2019	8 Weeks
I Mid Examinations	18-03-2019	23-03-2019	1 Week
II Unit of Instructions	25-03-2019	18-05-2019	8 Weeks
II Mid Examinations	20-05-2019	25-05-2019	1 Week
Preparation & Practical	27-05-2019	01-06-2019	1 Week
End Examinations	03-06-2019	15-06-2019	2 Weeks

Proposed B.Tech III & IV Sem Academic Calendar (for the A.Y.2019-20)

B.TECH III SEM			
Description	**From**	**To**	**Weeks**
Commencement of Class Work	10.06.2019		
I Unit of Instructions	10.06.2019	03.08.2019	8 Weeks
I Mid Examination	05.08.2019	10.08.2019	1 Week
II Unit of Instructions	12.08.2019	05.10.2019	8 Weeks
II Mid Examination	07.10.2019	12.10.2019	1 Week
Comprehensive Test	14.10.2019	19.10.2019	1 Week
Preparation and Practical's	21.10.2019	25.10.2019	5 Days
End Examinations	28.10.2019	09.11.2019	2 Weeks
B.TECH IV SEM			
Commencement of Class Work	11.11.2019		
I Unit of Instructions	11.11.2019	04.01.2020	8 Weeks
I Mid Examination	06.01.2020	11.01.2020	1 Week
II Unit of Instructions	13.01.2020	07.03.2020	8 Weeks
II Mid Examination	09.03.2020	14.03.2020	1 Week
Comprehensive Test	16.03.2020	21.03.2020	1 Week
Preparation and Practical's	23.03.2020	27.03.2020	5 Days
End Examinations	30.03.2020	11.04.2020	2 Weeks

Proposed MBA III & IV Sem Academic Calendar (for the A.Y.2019-20)

MBA III SEM			
Description	**From**	**To**	**Weeks**
Commencement of Class Work	22-07-2019		
I Unit of Instructions	22-07-2019	14-09-2019	8 Weeks
I Mid Examination	16-09-2019	25-09-2019	9 Days
II Unit of Instructions	26-09-2019	23-11-2019	8 Weeks
II Mid Examination	25-11-2019	04-12-2019	9 Days
End Examinations	09-12-2019	26-12-2019	2 Weeks
MBA IV SEM			
Commencement of Class Work	30-12-2019		
I Unit of Instructions	30-12-2019	22-02-2020	8 Weeks
I Mid Examination	24-02-2020	03-03-2020	8 Days
II Unit of Instructions	04-03-2020	28-04-2020	8 Weeks
II Mid Examination	29-04-2020	09-05-2020	11 Days
End Examinations	11-05-2020	26-05-2020	2 Weeks

Annexure-XI

CONDITIONS FOR PROMOTION OF LATERAL ENTRY STUDENTS:

Minimum academic requirements:

The following academic requirements have to be satisfied.

- A Student shall be promoted from II Year to III Year if he/she fulfills the minimum attendance requirement.
- A Student shall be promoted from III Year to IV Year only if he/she earns 50% of the Credits specified up to and including III year I semester.