Government College of Engineering, Karad

SCHEME OF INSTRUCTION & SYLLABI

Programme: Electronics and Telecommunication Engineering

Scheme of Instructions: Second Year B. Tech. in Electronics and Telecommunication Engineering

Semester – III

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Course Credits	EXAM SCHEME				
									CT-1	CT-2	TA/CA	ESE	TOTAL
1	HSMC	EX2301	Values and Ethics for Engineers	2	-	-	2	2	15	15	10	60	100
2	BSC	EX2302	Mathematics – III	3	-	-	3	3	15	15	10	60	100
3	ESC	EX2303	Analog Circuits	3	1	-	4	4	15	15	10	60	100
4	ESC	EX2304	Electronic Devices and Materials	4	-	-	4	4	15	15	10	60	100
5	PCC	EX2305	Digital Electronics	3	1	-	4	4	15	15	10	60	100
6	ESC	EX2306	Analog Circuits Lab	-	-	2	2	1	-	-	25	50	75
7	PCC	EX2307	Digital Electronics Lab			2	2	1			25	50	75
8	P/S/IT	EX2308	Industrial Training	-	-	2	-	1	-	-	25	25	50
			Total	**15**	**2**	**06**	**21**	**20**	**75**	**75**	**125**	**425**	**700**

L- Lecture T-Tutorial P-Practical

CT1- Class Test 1 TA/CA- Teacher Assessment/Continuous Assessment

CT2- Class Test 2 ESE- End Semester Examination (For Laboratory End Semester performance)

Course Category	HSMC (Hum., Soc. Sc, Mgmt.)	BSC (Basic Sc.)	ESC (Engg. Sc.)	PCC (Programme Core Courses)	PEC (Programme Elective Courses)	OEC (Open Elective courses from other discipline)	MCC (Mandatory Courses)	Project / Seminar / Industrial Training
Credits	02	03	09	05	--	--	--	01
Cumulative Sum	05	21	25	05	--	--	--	01

PROGRESSIVE TOTAL CREDITS : 37+20 =57

Government College of Engineering, Karad

SCHEME OF INSTRUCTION & SYLLABI

Programme: Electronics and Telecommunication Engineering

Scheme of Instructions: Second Year B. Tech. in Electronics and Telecommunication Engineering

Semester – IV

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Course Credits	EXAM SCHEME				
									CT-1	CT-2	TA/CA	ESE	TOTAL
1	OEC	EX2401	Transducers and Measurement	3	-	-	3	3	15	15	10	60	100
2	ESC	EX2402	Signals and Systems	3	-	-	3	3	15	15	10	60	100
3	PCC	EX2403	Analog Communication	3	-	-	3	3	15	15	10	60	100
4	PCC	EX2404	Microcontroller and Interfacing	3	-	-	3	3	15	15	10	60	100
5	PCC	EX2405	Network Analysis and Synthesis	3	-	-	3	3	15	15	10	60	100
6	OEC	EX2406	Transducers and Measurement Lab	-	-	2	2	1	-	-	25	-	25
7	PCC	EX2407	Analog Communication Lab	-	-	2	2	1	-	-	25	25	50
8	PCC	EX2408	Microcontroller and Interfacing Lab	-	-	2	2	1	-	-	25	25	50
9	PCC	EX2409	Signal, Network Analysis and Synthesis Lab	-	-	2	2	1	-	-	25	25	50
10	MCC	EX2410	Environmental Science	2	-	-	2	Audit	15	15	10	60	100
11	HSMC	EX2411	Technical Presentation	-	1	-	1	1			25	-	25
			Total	**17**	**01**	**08**	**26**	**20**	**90**	**90**	**185**	**435**	**800**

Lecture--L T-Tutorial P-Practical

CT1- Class Test 1 TA/CA- Teacher Assessment/Continuous Assessment

CT2- Class Test 2 ESE- End Semester Examination (For Laboratory End Semester performance)

Course Category	HSMC (Hum., Soc. Sc, Mgmt.)	BSC (Basic Sc.)	ESC (Engg. Sc.)	PCC (Programme Core courses)	PEC (Programme Elective courses)	OEC (Open Elective courses from other discipline)	MCC (Mandatory Courses)	Project / Seminar / Industrial Training
Credits	01	--	03	12	--	04	Yes	--
Cumulative Sum	06	21	28	17	--	04	--	01

PROGRESSIVE TOTAL CREDITS : 57+20 =77

Government College of Engineering, Karad

Second Year B. Tech. Electronics and Telecommunication (Semester – III)

EX2301: Values and Ethics for Engineers

Teaching Scheme			Examination Scheme	
Lectures	02 Hrs/week		CT – 1	15
Tutorials	00 Hrs/week		CT – 2	15
Total Credits	02		TA	10
			ESE	60
			Duration of ESE	02 Hrs 30 Min

Course Outcomes (CO)

Student Will be able to

1.	Identify basic universal human values.
2.	Practice moral Judgment in condition of dilemma.
3.	Outline various types of rights and ethical conducts.
4.	Exhibit correct moral ethical behavior.

	Course Contents	Hours
Unit 1	**Human Values:** Moral value ethics, Integrity, Work ethics, Service learning, virtues, Respect for others, Living peacefully, Caring, Sharing, Honesty, Courage, Valuing time, Cooperation, Commitment, Empathy, Self-confidence, Challenges in the work place spirituality.	**(03)**
Unit 2	**Engineering Ethics:** Overview, Senses of engineering ethics, Variety of moral issues, Types of inquiries, Moral dilemma, Moral autonomy, Moral development (theories), Consensus and controversy, Profession, Models of professional roles, Responsibility ,Theories about right action (Ethical theories),Self-control, Self-interest, Customs, Religion, Self-respect (Case study: Choice of the theory)	**(04)**
Unit 3	**Engineering as Social Experimentation:** Engineering as experimentation, Engineers as responsible experimenters, Codes of ethics, Industrial standards a balanced outlook on law, Safety. **Responsibilities and Rights:** Safety definition Safety and risk, Risk analysis, Assessment of safety and risk, Safe exit, Risk-benefit analysis, Collegiality and loyalty, Collective bargaining, Confidentiality, Conflict of interests, Occupational crime, Human rights, Employee rights, (Case study: The challenger)	**(05)**
Unit 4	**Moral Reasoning and Moral Frameworks:** Moral choices and Ethical dilemmas, Steps in resolving ethical dilemmas, Right-Wrong or Better-Worse? Moral Decision Making as Design Rights Ethics, Duty Ethics, Utilitarianism, Virtue Ethics, Self-Realization Ethics, Ethical Egoism, Best Ethical Theory	**(04)**
Unit 5	**Truth and Truthfulness:** Whistle-Blowing: Definition, Moral Guidelines, Protecting Whistle-Blowers, Common Sense Procedures, Beyond Whistle-Blowing, Honesty and Research Integrity, Truthfulness, Trustworthiness, Academic Integrity: Students, Research Integrity, Bias and Self-Deception, Protecting Research Subjects, Giving and Claiming Credit	**(04)**
Unit 6	**Global Issues:** Globalization, Multinational corporations, Environmental ethics, Computer ethics, Weapons development, Engineers as managers, Consulting engineers, Engineer as expert witness, Engineers as advisors in planning and policy making, Moral leadership, Codes of ethics	**(04)**

Text Books

1.	R.S NAAGARAZAN, "Professional Ethics and Human Values", New Age International (P) Limited Publishers (Unit:1, 2, 3 & 6)
2.	Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw-Hill, New York 1996. (Unit: 4 & 5)

Reference Books

1.	A.N. Tripathy, 2003," Human Values", New Age International Publishers.
2.	M Govindrajan, S Natrajan & V. S Senthil kumar,"Engineering Ethics (including Humna Values)", Eastern Economy Edition, Prentice Hall of India Ltd.
3.	William. K. Frankena, "Ethics", Prentice-Hall of India, Pvt. Ltd, New Delhi

Useful Links

1.	https://nptel.ac.in/courses/109/104/109104068/
2.	https://nptel.ac.in/courses/110105097/

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO 1	-	-	-	-	-	-	-	-	-	3	-	1	-	-
CO2	-	-	-	-	-	-	-	1	-	2	-	-	-	-
CO 3	-	-	-	-	-	-	-	-	-	3	-	1	-	-
CO 4	-	-	-	-	-	-	-	2	-	3	-	-	-	-

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	CT 1	CT 2	TA	ESE
Remember	5	5	3	20
Understand	10	5	3	20
Apply	-	5	4	20
Analyze	-	-	-	-
Evaluate	-	-	-	-
Create	-	-	-	-
TOTAL	15	15	10	60

Government College of Engineering, Karad

Second Year B. Tech. Electronics and Telecommunication Engineering (Semester – III)

EX2302: Mathematics-III

Teaching Scheme			Examination Scheme	
Lectures	03 Hrs/week		CT – 1	15
Tutorials	-		CT – 2	15
Total Credits	03		TA	10
			ESE	60
			Duration of ESE	02 Hrs 30 Min

Course Outcomes (CO)

Student Will be able to

1.	To obtain Fourier Transform to solve differential application and apply to signal processing.
2.	Design problems on Linear differential equations and their applications which would enable students to obtain engineering solutions for given situations they may encounter in their profession.
3	Understand probability which would enable students to find engineering solutions for given situations
4	To obtain expertise in vector integral calculus and its applications

	Course Contents	Hours
Unit 1	**Application of Linear Differential Equations (LDE) to Electrical and Electronics circuit:** L-C-R Circuit, Application of R-L,R-C,R-L-C Circuit in time domain using differential equation. Coupled Electrical Circuits, Spring-Mass system.	**(5)**
Unit 2	**Partial Differential Equations (PDE):** First order linear/ nonlinear Partial Differential Equation Formation **(PDE)**, Lagrange's equation, Linear Partial Differential Equations of second and higher order with constant coefficients, Linear non-homogeneous PDE. Applications of Partial Differential Equations: Solutions of one-dimensional wave equation, one-dimensional heat equation, Steady state solution of two-dimensional heat equation.	**(10)**
Unit 3	**Fourier Transform:** Fourier sine and cosine integrals, Fourier sine transform, Fourier cosine transform, Inverse Fourier transform.	**(6)**
Unit 4	**Probability and Distribution Theory** The notion of probability and basic properties. Random Variable, Discrete and continuous random variable, Expected value of random variable, Variance, Moments & moment generating functions. Probability mass function & Probability density function, Probability distribution for random variables, Binomial, Poisson and Normal distributions.	**(9)**
Unit 5	**Correlation and Regression:** Correlation and regression analysis, Linear regression, multivariable regression .Analysis of variance, Least square curve fitting	**(6)**
Unit 6	**Vector Integral Calculus:** Line integral, Greens Theorem, Stokes and Gauss Theorem and applications of all above theorems.	**(6)**

Text Books

1.	Erwin Kreyszig, "Advanced Engineering Mathematics", 8thEdition, Wiley Eastern Ltd. Mumbai.
2.	J. N. Wartikar & P. N. Wartikar, "A text book of Applied Mathematics: Vol. I, II and III", Vidyarthi Griha Prakashan, Pune.
3.	H.K.DASS"Advance Engineering Mathematics"S.Chand publications. Fifteenth revised edition2006
4.	Debashis Datta"Textbook of Engineering Mathematics" New Age International Publication. Revised second Edition

Reference Books

1.	B.S.Grewal, "Higher Engineering Mathematics", Khanna Publication, New Delhi.
2.	S. D. Sharma, "Operations Research".
3.	Kanti B. Datta, Cengage Learning, "Mathematical Methods of Science and Engineering (Aided with MATLAB)".
4.	G.B.Thomas and R.L.Finney, Calculus and Analytic gemetry,9th Edition ,Pearson ,Reprint ,2002.

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	3	2	2	2	2	2	-	-	-	-	-	-	1	-	-
CO 2	2	1	2	1	1	-	-	1	-	-	-	-	1	-	-
CO 3	1	2	1	2	2	1	-	-	-	-	1	1	2	-	-
CO 4	1	2	1	2	2	1	-	-	-	-	1	1	1	-	-

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	CT 1	CT 2	TA	ESE
Remember	-	-	-	5
Understand	5	-	5	35
Apply	5	5	5	10
Analyze	5	5	-	5
Evaluate	-	5	-	5
Create	-	-	-	-
TOTAL	15	15	10	60

Government College of Engineering, Karad

Second Year B. Tech. Electronics and Telecommunication Engineering (Semester – III)

EX2303 : Analog Circuits

Teaching Scheme			Examination Scheme	
Lectures	03 Hrs/week		CT – 1	15
Tutorials	01 Hrs/week		CT – 2	15
Total Credits	04		TA	10
			ESE	60
			Duration of ESE	02 Hrs 30 Min

Course Outcomes (CO)

Student Will be able to

1.	Explain various semiconductor devices like BJT and FET.
2.	Make use of DC and AC analysis of BJT and FET for designing amplifier.
3.	Build different amplifier configurations using BJT and FET.
4.	Analyze the working of various circuits for different application designed using operational amplifier.

	Course Contents	Hours
Unit 1	**Bipolar Junction Transistor:** Bipolar Junction Transistor - construction, configurations, characteristics. Concept of DC and AC load line and biasing, bias stabilization, thermal runaway, thermal stabilization.	**(6)**
Unit 2	**BJT AC Analysis:** Amplification in the AC Domain. BJT Transistor Modeling - The CE Transistor Model, CE Emitter-Bias Configuration, Emitter- Follower Configuration ,CB Configuration, Darlington Connection, Multistage Amplifiers. The Hybrid Equivalent Model, Hybrid π Model. Low and High-Frequency Response of BJT Amplifier, Miller Theorem	**(8)**
Unit 3	**Field Effect Transistors:** FET, MOSFET and MOSFET Types-Construction, Characteristics. FET biasing – Fixed-Bias, self and voltage divider biasing for JFET and biasing of MOSFET, Introduction to CMOS, HMOS.	**(8)**
Unit 4	**FET Amplifiers:** JFET Small Signal Model-Fixed-Bias, Self-Bias and Voltage Driver Configuration, E-MOSFET-Drain Feedback Configuration, E-MOSFET Voltage Divider Configuration. Low and High Frequency Response of FET Amplifier.	**(8)**
Unit 5	**Operational Amplifier:** Basics of op-Amp, Ideal and practical op-amp parameter, virtual short concept, closed and open loop configuration, Internal Block Diagram of an Op-Amp, Inverting Amplifier, Non inverting Amplifier, Voltage-follower, Comparator, Voltage Buffer	**(6)**
Unit 6	**Op-Amp Applications:** Summing amplifier, Difference amplifier, Integrator, Differentiator, Instrumentation amplifier, V to I and I to V convertor.	**(6)**
	Self-Study: Feedback amplifiers, Multistage amplifiers	

Text Books

1.	Electronic devices and circuit theory - Robert L. Boylestad, Louis Nashelsky. —11th edition.
2.	Op-Amps and Linear Integrated Circuits by Ramakant A. Gayakwad, Prentice Hall of India, 4Th Edition,2000.

Reference Books

1.	Electronic devices Thomas L. Floyd. — 9th edition. Pearson Education 2012
2.	Electronic Devices and Circuits by David A. Bell, OXFORD, 5th Edition, 2008
3.	Electronic Circuit Analysis and Design, Donald A. Neamen, Tata McGraw Hill, 2nd Edition, 2002.

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	1	2	2	1	-	-	-	-	1	-	-	1	2	-	-
CO 2	1	1	2	2	-	-	-	-	-	-	-	1	3	-	-
CO 3	1	2	-	2	-	-	-	-	1	-	-	-	2	-	-
CO 4	1	2	1	-	-	-	-	-	-	-	-	1	1	-	-

Assessment Pattern(with revised Bloom's Taxonomy)

Knowledge Level	CT 1	CT 2	TA	ESE
Remember	-	-	-	-
Understand	10	5	5	15
Apply	5	5	5	25
Analyze	-	5	-	20
Evaluate	-	-	-	-
Create	-	-	-	-
TOTAL	15	15	10	60

Government College of Engineering, Karad

Second Year B. Tech. Electronics and Telecommunication Engineering (Semester – III)

EX 2304 : Electronic Devices and Materials

Teaching Scheme			Examination Scheme	
Lectures	04 Hrs/week		CT – 1	15
Tutorials	-		CT – 2	15
Total Credits	04		TA	10
			ESE	60
			Duration of ESE	02 Hrs 30 Min

Course Outcomes (CO)

Student Will be able to

1.	Understand semiconductor and magnetic properties of electronics engineering materials
2.	Explain the applications for the given type of material.
3.	Interpret Optical Properties and the synthesis of Nano, Bio, Smart and Functional materials and their application and its impact on environment, in the context of electronics engineering.
4.	Understand the application of the semiconductor materials viz. diode. & Integrated Circuits.

		Hours
Unit 1	**Semiconductor materials:** Introduction to Band Structure, Band Model, Intrinsic Semiconductor, p-n Junctions and their Characteristics, Doping Processes, Devices Using Semiconductors, Concept of Large scale Integration (LSI) , Metallization, Oxidation of Silicon and Gallium Arsenide, Gallium Nitride, Lithography and Etching , Packaging and Packing Materials	**(8)**
Unit 2	**Diode Circuits :** Diode circuits such as HWR, FWR, clippers, clampers; Zener diode, Applications of zener diode such as regulated power supply, Types of different diodes such as LED, Schottky, tunnel, PIN, solar cell, and their applications; Datasheets of commonly used diodes.	**(8)**
Unit 3	**Optical Materials:** Emission of Continuous Radiation and it's Characteristic, Applications of Photon Emission, Laser and LED Materials, Spontaneous emission & stimulated emission, Case Study – A Compact Disc (CD) System, Thermal Photoemission, Interaction of Photons with Materials , Case Study – Optical Fibers and Optoelectronic Systems.	**(10)**
Unit 4	**Thin Film Electronic Materials and Nano materials:** Introduction, Techniques for Preparation of Thin Films, Thin Film Conducting Materials, Thin Film Resistors, Transparent and Conductive Thin Films ,Thin Film Magnetic Materials. Introduction to MEMs, Nano, Bio, Smart and Functional materials, Nano fiber material, VLSI material, sensor material, Techniques for Preparation of Nano materials, Micro-nano devices Using Nanostructure Materials.	**(10)**
Unit 5	**Magnetic & Dielectric Materials :** Fundamentals of Soft Magnetic Materials & Hard Magnetic Materials, Ferrites – Ceramic Magnetic Materials , Dilute Magnetic Semiconductor (DMS) , Case Study – Materials in Magnetic Recording , Hard Disk Drive. Fundamentals of Dielectric Materials, Capacitors, Ferroelectric Materials, Piezoelectric Materials, Pyroelectric Materials, Case Study – Materials for Transducers.	**(8)**
Unit 6	**Oscillator, Multivibrator &Timing Circuits:** Positive feedback, Barkhausen criterion for oscillations, Different oscillator circuits: Hartley, Colpitts, phase shift and Wien's bridge Using Transistors & Op-Amp. Basics of IC 555, Multi-vibrator using IC 555 (Monostable, Bistable and Astable).	**(8)**

Text Books

1.	Electronic devices and circuit theory - Robert L. Boylestad, Louis Nashelsky. —11th edition.
2.	Op-Amps and Linear Integrated Circuits by Ramakant A. Gayakwad, Prentice Hall of India, 4Th Edition,2000.
3.	Callister's Materials Science and Engineering, 2nd ED, Adapted by R Balasubramaniam, 2010, ISBN-13: 978-8126521432, Wiley India Ltd.
4.	A. J. Dekker, 'Electrical Engineering Materials', Prentice hall of India, India

Reference Books

1.	C.S.Indulkar and S. Thiruvengadam, S., "An Introduction to Electrical Engineering materials"4th Edn. 2004

2.	Kenneth G. Budinski,, "Engineering Materials: Prentice Hall of India, New Delhi
3.	Wei Gao, Zhengwei Li, Nigel M. Sammes "An introduction to electronic materials for engineers", 2nd edition, ,World scientific publication
4.	V Raghavan, "Materials Science and Engineering: A First Course, 5th Ed, 2004, PHI India
5.	J. Millman & C.Halkias, "Electronic devices & circuits", Tata McGraw Hill Publication.

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 6	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	1	2	2	1	-	-	-	-	1	-	-	1	-	-	-
CO 2	1	1	2	2	-	-	-	-	-	-	-	1	2	1	-
CO 3	1	2		2	-	-	-	-	1	-	-	-	2	1	-
CO 4	1	2	1	-	-	-	-	-	-	-	-	1	1	1	-

Assessment Pattern**(with revised Bloom's Taxonomy)**

Knowledge Level	CT 1	CT 2	TA	ESE
Remember	-	-	-	-
Understand	10	05	05	15
Apply	05	05	05	25
Analyze	-	05	-	20
Evaluate	-	-	-	-
Create	-	-	-	-
TOTAL	15	15	10	60

Government College of Engineering, Karad

Second Year B. Tech. Electronics and Telecommunication Engineering (Semester – III)

EX2305: Digital Electronics

Teaching Scheme			Examination Scheme	
Lectures	03 Hrs/week		CT – 1	15
Tutorials	01 Hrs/week		CT – 2	15
Total Credits	04		TA	10
			ESE	60
			Duration of ESE	02 Hrs 30 Min

Course Outcomes (CO)

Student Will be able to

1.	Design a digital logic and apply it to solve real life problems.
2.	Analyze, design and implement combinational logic circuits.
3.	Analyze, design and implement sequential logic circuits.
4.	Examine various memory and programmable logic devices.

	Course Contents	Hours
Unit 1	**Arithmetic Operation and Minimization Techniques :** Number Conversion, Arithmetic's operation, Logic gates, Minimization Techniques:- Boolean postulates and laws , De Morgan's Theorem, Principle of Duality, Minimization of Boolean expressions :- SOP, POS , Karnaugh map.	**(7)**
Unit 2	**Combinational Circuits:** Half adder, Full Adder, Half Subtractor, Full Subtractor, Parallel binary adder/Subtractor, Carry Look Ahead adder, Serial Adder/Subtractor, BCD adder, Multiplexer, Demultiplexer, Decoder, Encoder, Parity checker & parity generators ,code converters(Binary to gray & vice- versa,excess-3 code) , Magnitude Comparators.	**(7)**
Unit 3	**Sequential Circuits:** Latches, Flip flops:-SR, JK, D, T, and Master Slave, Characteristic table and equation, Edge triggering, Level Triggering. Synchronous and Asynchronous Counters Design of Synchronous counters:- state diagram ,State table ,State minimization , Moore/Mealy machines. Modulo N counter. Shift registers, Universal shift registers , Shift register counters.	**(8)**
Unit 4	**Memory Devices:** Memory types, Memory expansion, Classification of memories:-ROM, ROM organization, PROM, EPROM, EEPROM, EAPROM, RAM, RAM organization, Write operation, Read operation. Programmable Logic Devices: – Programmable Logic Array (PLA), Programmable Array Logic (PAL), ASIC, Implementation of combinational logic circuits using ROM, PLA, PAL. FSM.	**(7)**
Unit 5	**Logic Families:** Logic Families–Significance and Types, Characteristic, Multilevel gate implementations, Tristate gates, TTL NAND Gate, Emitter Coupled Logic (ECL), NMOS and PMOS Logic, CMOS Logic Family, Comparison of Different Logic Families.	**(5)**
Unit 6	**Introduction to 8086 microprocessor:** Introduction, Block diagram of 8086 Architecture and organization, pin configuration. Minimum and Maximum modes. Read and Write bus cycle .Instruction set and programming, Addressing modes. Peripherals interfacing with 8086 and applications. 8086-Interrupt structure. Programmable peripheral Interface 8255.8087 Math coprocessor.	**(10)**

Tutorials

10 Tutorials based on above syllabus.

Text Books

1.	R.P. Jain, "Modern Digital Electronics", 4th edition, Tata McGraw - Hill Education, 2010.
2.	M. Morris Mano, "Digital Design", Pearson Education (3rd Edition) (Unit 1,2,3,4)
3.	A. Anand Kumar, "Fundamentals of digital circuits", 1st edition, PHI publication, 2001.
4.	Mathur Sunil "Microprocessor 8086 : Architecture, Programming and Interfacing" PHI Learning Pvt. Ltd., 2011

Reference Books

1.	Anil K. Maini, "Digital Electronics principles and Integrated Circuits", Wiley Publications.
2.	Microprocessor 8086 data sheets
3.	Andrew Rood , Douglas V. Hall "Microprocessors and Interfacing: IBM Version: Programming and Hardware (McGraw-Hill International Editions: Computer Science Series)" Paperback – Import, 1 March 1992
4.	Youzheng Liu, Glenn A. Gibson"Microcomputer Systems: The 8086/8088 Family : Architecture, Programming, and Design" Prentice-Hall, 1986

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	1	-	-	-	-	-	-	-	1	1	-	1	1	1	2
CO 2	2	2	2	2	3	-	-	-	-	-	-	2	2	2	3
CO 3	3	3	3	3	3	-	-	-	1	2	-	-	2	2	2
CO 4	3	3	3	3	3	-	-	-	-	2	-	3	3	2	2

Assessment Pattern**(with revised Bloom's Taxonomy)**

Knowledge Level	CT 1	CT 2	TA	ESE
Remember	-	-	-	05
Understand	05	-	05	35
Apply	05	05	05	10
Analyse	05	05	-	05
Evaluate	-	05	-	05
Create	-	-	-	-
TOTAL	15	15	10	60

Government College of Engineering, Karad				
Second Year B. Tech. Electronics and Telecommunication Engineering (Semester – III)				
EX2306 : Analog Circuits Lab				
Laboratory Scheme			**Examination Scheme**	
Practical	2 Hrs/week		TA/CA	25
Total Credits	1		ESE	50

Course Outcomes (CO)

Student Will be able to

1.	Analyze the characteristics of different electronic devices such as BJT,FET etc.
2.	Compare different configurations of BJT and FET for practical applications.
3.	Demonstrate op amp for practical applications.
4.	Construct and test amplifier circuits and interpret the results for practical applications.

	List of Experiment	
Experiment 1	Study of V-I characteristics of PN junction diode and applications of diode in rectifiers, clippers and clampers.	
Experiment 2	Draw the input and output characteristics of transistor connected in CE and CB Configuration and find Input Resistance (Ri), Output Resistance (Ro) and Current amplification Factor (β) of the given transistor.	
Experiment 3	Compare the relationship between IC & ICO for Self-Bias and Fixed Bias Circuits and find the stability factor for each case FET.	
Experiment 4	Design a single stage RC coupled CE amplifier with potential divider bias and (i) Observe the phase difference between input and output waveforms (ii) Measure mid band gain (iii) Plot its frequency response and determine the bandwidth.	
Experiment 5	a) Draw drain and Transfer characteristics of a given FET in CS Configuration and find drain resistance (rd), amplification factor (μ) and Trans-Conductance (gm) of the given FET. b) Obtain the frequency response of the single stage Common Source amplifier and measure the voltage gain and bandwidth of amplifier.	
Experiment 6	Design and Analyze Voltage series feedback amplifier using BJT/FET and verify its effect on frequency response.	
Experiment 7	Measure the DC input offset parameters of an operational amplifier and compare measured parameters with manufacturers specifications.	
Experiment 8	Design and develop practical application using an inverting amplifier and non-inverting circuit with op amp for a specified gain, plot the waveforms, observe the phase reversal.	
Experiment 9	Design and setup a summing and difference amplifier circuit with op amp for a specified gain and verify the output.	
Experiment10	Design, construct and verify the response of a) Integrator using Op-amp for sine and square wave inputs at 1 KHz frequency. b) Differentiator using Op-amp for sine and square wave inputs at 1 KHz frequency.	
Experiment11	Study of two stage RC coupled amplifier and measure the mid band gain.	
Experiment12	Design and study the operation of astable and monostable multivibrator using 555 IC timer.	
	Note: Three to four experiments may be conducted using simulator.	
List of Submission		
1	Total number of Experiments: 12	
2	Total number of sheets: NA	
3	Course Project work & Report: NA	
4	Seminar report: NA	
5	Field Visit Report: NA	

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 6	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	1	2		1	-	-	-	-	2	-	-	1	3	1	-
CO 2	1				-	-	-	-	2	-	-		3	1	-
CO 3	2	1	3		-	-	-	-	1	-	-	2	3	1	-
CO 4	1	2	1	-	-	-	-	-	1	-	-	1	3	1	-

Assessment Pattern(with revised Bloom's Taxonomy)

Knowledge Level	CA	ESE
Remember	-	-
Understand	5	15
Apply	7	5
Analyze	8	10
Evaluate	-	10
Create	5	10
TOTAL	25	50

Government College of Engineering, Karad				
Second Year B. Tech. Electronics and Telecommunication Engineering (Semester – III)				
EX2307 : Digital Electronics Lab				
Laboratory Scheme			**Examination Scheme**	
Practical	2 Hrs/week		TA/CA	25
Total Credits	1		ESE	50

Course Outcomes (CO)

Student Will be able to

1.	Construct basic combinational circuits and verify their functionalities.
2.	Apply the design procedures to design basic sequential circuits.
3.	Construct digital circuits used for customized applications.
4.	Apply the fundamentals of assembly level programming of microprocessors and microcontroller

	List of Experiment	
Experiment 1	Realization of logic gates OR, AND, NOT, NOR, NAND, EX-OR, EX-NOR gates using ICS & verify its truth tables.	
Experiment 2	Design code convertors (Binary To Gray & Vice-Versa).	
Experiment 3	Prototyping of source to destination communication using MUX (IC74151) and DEMUX(IC 74138).	
Experiment 4	Realization of IC7483 as parallel adder and substractor.	
Experiment 5	Design and build 4-bit, 8-bit comparator using IC 7485.	
Experiment 6	Realization of all modes of universal shift register using IC 7495.	
Experiment 7	Design ring and Johnson counter using flip-flops.	
Experiment 8	Design 4-bit UP/DOWN synchronous counter using IC.	
Experiment 9	Arithmetic operations using 8086 microprocessor: Multi-byte Addition, Subtraction, Multiplication, Division.	
Experiment10	Sorting given string in Ascending, Descending order using 8086 microprocessor.	
Experiment11	Programmable Peripheral Interface-8255. Interfacing switches and LEDs.	
Project Work	Mini project based on digital circuits/Microprocessor 8086 .	
	Note: Three to four experiments may be conducted using simulator.	
List of Submission		
1	Total number of Experiments: 11	
2	Total number of sheets: NA	
3	Course Project work & Report:01	
4	Seminar report: NA	
5	Field Visit Report: NA	

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 6	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	2	2	2	-	-	-	-	-	-	-	-	-	2	-	1
CO 2	3	-	3	3	-	-	2	-	-	2	-	-	2	-	1
CO 3	3	1	3	3	-	-	2	-	2	2	-	-	3	-	-
CO 4	2	2	2	-	-	-	-	-	-	-	-	-	1	-	1

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	CA	ESE
Remember	-	-
Understand	5	15
Apply	10	10
Analyze	5	10
Evaluate	-	5
Create	5	10
TOTAL	25	50

Government College of Engineering, Karad

Second Year B. Tech. Electronics and Telecommunication Engineering (Semester – III)

EX 2308 : Industrial Training

Teaching Scheme			Examination Scheme	
Practical	2 Hrs/week		TA	25
Total Credits	01		ESE	25

Course Outcomes (CO)

Student Will be able to

1.	Comprehend the knowledge gained in the course work
2.	Learn and apply appropriate techniques, resources, and modern engineering tools.
3.	Make aware the students to an industrial environment
4.	Understand maintenance functions.

	Course Contents	Hours
Task 1	Execution scheme Industrial training of two weeks should be done after semester-II in summer vacation and it's assessment will be done based on report submitted. Work load of the assessment can be assigned to the guide.	
Task 2	Industrial Training: The students have to undergo an industrial training of two weeks in an industry preferably dealing with Electronics and Telecommunication engineering during the semester break after second semester and complete within 15 calendar days before the start of third semester. The students have to submit a report of the training undergone and present the contents of the report before the evaluation committee constituted by the department. An internal evaluation will be conducted for examining the quality and authenticity of contents of the report and award the marks at the end of the semester. It is expected that students should undertake small assignment or work related to any of the course related aspect. Report is based on compilation of work carried out related to measuring instruments, state-of-art technologies and layout, Industry organization chart, Various departmental activities, Management functions, Safety, Rules and regulations, Documentation work, Industry standards, Processes and tools used, Industrial automation, Computerization and software used in various departments, Product flow, Testing and quality control checks and Packing procedures as identified.	
Task 3	**Industrial Training Report Format:** Maximum five students in one group, three groups shall work under one Faculty. However, each group should have different industrial training and its presentation. The report should be of 20 to 30 pages. For standardization of the report the following format should be strictly followed. 1. Page Size: Trimmed A4 2. Top Margin: 1.00 Inch 3. Bottom Margin: 1.32 Inches 4. Left Margin: 1.5 Inches 5. Right Margin: 1.0 Inch 6. Para Text: Times New Roman 12 Point. Font 7. Line Spacing: 1.5 Lines 8. Page Numbers: Right Aligned at Footer. Font 12 Point. Times New Roman 9. Headings: Times New Roman, 14 Point., Bold Face 10. Certificate: All students should attach standard format of Certificate as described by the department. Certificate should be awarded to batch and not to individual student. Certificate should have signatures of Guide, Head of Department and Principal. 11. The entire report should be documented as one chapter with details like a. "Name of Industry with address along with completed training certificate" b. Area in which Industrial training is completed All Students have to present their reports individually.	

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO3	PO4	PO5	PO6	PO7	PO 8	PO 9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3	-	1	-	-	1	-	1	2	2	-	2	-	-	2
CO 2	2	-	-	-	-	-	-	-	-	-	1	-	1	-	-
CO 3	3	-	1	-	-	2	-	2	1	3	-	1	1	1	2
CO 4	3	-	-	-	-	-	-	-	2	3	2	-	-	-	2

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	CT 1	CT 2	CA	ESE
Remember	-	-	08	-
Understand	-	-	10	08
Apply	-	-	07	10
Analyze	-	-	-	07
Evaluate	-	-	-	-
Create	-	-	-	-
TOTAL			25	25

Government College of Engineering, Karad

Second Year B. Tech. Electronics and Telecommunication Engineering (Semester – IV)

EX2401 : Transducers and Measurement

Teaching Scheme			Examination Scheme	
Lectures	03 Hrs/week		CT – 1	15
Tutorials	-		CT – 2	15
Total Credits	03		TA	10
			ESE	60
			Duration of ESE	02 Hrs 30 Min

Course Outcomes (CO)

Student Will be able to

1.	Classify and use transducers in applications.
2.	Analyze different sensors to develop applications.
3.	Analyze frequency using different analyzer.
4.	Design DAS systems for practical applications.

	Course Contents	Hours
Unit 1	**Passive Electrical Transducers:** **Resistive Transducers**- Resistance Thermometer, Resistive displacement, Resistive strain, Resistive Pressure, Resistive Optical radiation Transducers **Inductive Transducers**- Inductive Transducers, Inductive Displacement Transducers, Eddy current type Inductive Transducers **Capacitive Transducers**- Capacitive Thickness Transducers, Capacitive Displacement Transducers, Capacitive Moisture Transducers.	**(5)**
Unit 2	**Active Electrical Transducers:** **Thermo elective Transducers**- Thermoelectric Phenomena, Common Thermocouple system. **Piezoelectric Transducers** - Piezoelectric Phenomena Piezoelectric Force Transducers, Piezoelectric Strain Transducers, Piezoelectric Acceleration Transducers. **Magnetostrictive Transducers** - Magnetostrictive Phenomena, Magnetostrictive Force Transducers, Magnetostrictive Acceleration Transducers, Magnetostrictive Torsion Transducers. **Hall effect Transducers**, **Digital Tachometer, Sound Transducer,** **Photoelectric Transducers** - Photoelectric Phenomena, Photoconductive transducer, Photovoltaic transducer, Photo emissive Transducer.	**(8)**
Unit 3	**Qualities of Measurements and Measuring Instruments:** Performance characteristics, Static characteristics, error in measurements, Types of static errors, sources of errors, Dynamic characteristics, Statistical Analysis, Standard, electrical Standard, Atomic frequency and time standards. Basic LCR Bridge (Skeleton type), Q Meter, Megger, Transistor tester and Telemetry.	**(6)**
Unit 4	**Digital Instruments:** CRO, Digital Multi meters, Digital measurement of frequency, Digital Frequency meter, digital pH meter, Automation in digital instruments, Digital Phase Meter, Digital Capacitance Meter, Microprocessor based instruments, The IEEE 488 Bus.	**(8)**
Unit 5	**Wave Analyzers and Harmonic Distortions:** Basic wave analyser, Frequency Selective Wave Analyser, harmonic distortion analyser, Spectrum analyser, Digital Fourier Analyser, Practical FFT Spectrum Analysing using waveform processing.	**(8)**
Unit 6	**Data Acquisition System:** Objective of DAS, Signal conditioning of inputs, Single channel DAS, Multichannel DAS, Computer based DAS, D/A and A/D Converters - Variable Resistor Network, Ladder type, Practical D/A converter, D/A using Op-Amp , Data Loggers, Sensor based computer Data Systems, Electromechanical A/D converter.	**(7)**

Text Books

1.	H. S. Kalsi, “Electronic Instrumentation”, Tata McGraw-Hill, 3rd Edition,2010.
2.	D.V.S. Murty, "Transducers and Instrumentation" PHI, 2nd Edition,2012

Reference Books

1.	A.K.Sawhney, “A course in Electrical, Electronics measurement and Instrumentation”, Danpat Rai Publication.

2.	Welfrick Cooper, “Electronic Instrumentation and Measurement Techniques”, PHI Publication.
3.	David A Bell, “Electronic Instrumentation and Measurements”, Third Edition, Oxford.

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	1	2	2	2	-	1	-	-	1	-	-	1	-	-	-
CO 2	2	1	1	2	2	-	-	-	-	-	-	1	1	1	-
CO 3	3	3	2	2	-	-	-	-	1	-	-	2	2	-	-
CO 4	3	2	2	-	1	-	-	-	-	-	-	1=2	2	-	-

Assessment Pattern **(with revised Bloom’s Taxonomy)**

Knowledge Level	CT 1	CT 2	TA	ESE
Remember	-	-	-	05
Understand	05	-	05	25
Apply	05	05	05	20
Analyze	05	05	-	05
Evaluate	-	05	-	05
Create	-	-	-	-
TOTAL	15	15	10	60

Government College of Engineering, Karad

Second Year B. Tech. Electronics and Telecommunication Engineering (Semester – IV)

EX2402: Signals and Systems

Teaching Scheme			Examination Scheme	
Lectures	03 Hrs/week		CT – 1	15
Tutorials	-		CT – 2	15
Total Credits	03		TA	10
			ESE	60
			Duration of ESE	02 Hrs 30 Min

Course Outcomes (CO)

Student Will be able to

1.	Analyze Frequency response of CT- LTI using Laplace transform
2.	Analyze Fourier transform on signal and system.
3.	Construct FIR and IIR System structure in different forms .
4.	Correlate the DTFT of discrete time signal and response of DT-LTI system

	Course Contents	Hours
Unit 1	**Introduction to signals and systems:** Importance of signal and system, Continuous time signal & discrete time signal, analog & digital signal. Classification of signals (Even & odd signal, periodic & non-periodic signal, deterministic & non- deterministic signal, energy & power signal). Types of signal- unit impulse, unit step, unit ramp, complex exponential & sinusoidal, sinc, rectangular, triangular and signum. **Operations on signals:** Amplitude Scaling, Addition, Multiplication, Differentiation, Integration, Time Scaling and Folding, Time Shifting of Continuous and discrete time signals. **Classification of Systems:** System Representation, continuous time Systems & discrete Systems, system with and without memory (static and dynamic), Causal and Non-causal system, Linear and Non-linear system, Time invariant and Time variant system, Stable and Unstable system, Invertible Systems, properties of systems.	**(8)**
Unit 2	**Fourier Transform and Continuous Time LTI Systems:** Review of Fourier series (Trigonometric and Exponential form and its relation), Need of Fourier Transform, Fourier Transform pair, Fourier Spectra, Convergence of FT. Properties of Fourier transform**:** Linearity, Time shifting, Frequency scaling, Time scaling, Time reversal, Duality, differentiation in time domain and frequency domain, Integral in time domain, Multiplication, Convolution and Parseval's relation Fourier transform of periodic signal. Analysis of CT-LTI system using Fourier Transform.	**(8)**
Unit 3	**Laplace transform and Continuous Time LTI Systems:** **Laplace Transform** -Definition and its properties, ROC and pole zero concept. Properties and theorem of Laplace Transform, Application of Laplace transforms to the continuous time LTI system analysis. Inversion using duality, numerical based on properties, properties of CT- LTI systems. Convolution integral & its properties, convolution sum & its properties, **Representation and Analysis of CT-LTI Systems:** Described by differential equation and in Laplace S-domain, Response of CT-LTI using Laplace transform. Representation of CT -LTI in S- domain using Direct Form -I, Direct Form -II , Cascade and parallel form.	**(8)**
Unit 4	**Discrete Fourier Series and Discrete Fourier Transform :** Fourier series of discrete time signal, Properties of discrete time Fourier series. Fourier Transform of discrete time signal, (DTFT) Comparison of Fourier transform of Discrete and Continuous time signal, Properties of DTFT. Analysis of DT-LTI using DTFT. Frequency response of first order and second order DT-LTI system. Aliasing in frequency domain due to sampling.	**(6)**
Unit 5	**Convolution and Correlation in Discrete Time System:** Representing DT-LTI using difference equations, Classification of discrete time system, FIR and IIR Systems. Discrete or linear convolution, Circular Convolution, Overlap adds and Overlap save convolution. Correlation, Cross correlation and Auto correlation and its properties.	**(6)**
Unit 6	**Z transform-** Introduction of Z-transform, Relation between DTFT and Z-transform, ROC, properties of ROC, Unilateral and bilateral Z-transform, Properties of Z transform: Linearity, Time Shifting, Time Reversal, Time Scaling, Convolution, Differentiation, Multiplication, Parseval's theorem, Initial value & Final value theorem. Inverse Z- transform: Long division method, PFE method, Residue method. Transfer function (Poles & Zeros). Stability Analysis .	**(6)**

Text Books				
1.	A Nagoor Kani “Signals & system”, TMH Publication.			
2.	Ramesh Babu “Signals & system”, SciTech Publication.			
3.	Dr.Sanjay Shrma,"Signals & System", S.K.Kataria & Sons.			
Reference Books				
1.	Michael J. Roberts, “Fundamentals of signals & systems”, Tata McGraw Hill.			
2.	B. P. Lathi , “Signals Systems and Communication”, BS Publications			
3.	Alan V. Oppenheim ,Alan S. Willsky with S. Hamid "Signals and Systems" (2nd Edition)			

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 6	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	2	3	1	2	2	-	-	-	1	-	1	-	2	1	1
CO 2	2	3	2	1	2	-	-	-	1	-	-	-	2	1	1
CO 3	2	2	1	1	2	-	-	-	-	-	-	-	1	2	2
CO 4	2	2	2	2	2	-	-	-	-	-	-	-	2	1	2

Assessment Pattern (with revised Bloom’s Taxonomy)

Knowledge Level	CT 1	CT 2	TA	ESE
Remember	-	-	-	-
Understand	05	-	-	25
Apply	05	05	05	15
Analyze	05	05	05	10
Evaluate	-	05	-	10
Create	-	-	-	-
TOTAL	15	15	10	60

Government College of Engineering, Karad

Second Year B. Tech. Electronics and Telecommunication Engineering (Semester – IV)

EX2403: Analog Communication

Teaching Scheme			**Examination Scheme**	
Lectures	03 Hrs/week		CT – 1	15
Tutorials	-		CT – 2	15
Total Credits	03		TA	10
			ESE	60
			Duration of ESE	02 Hrs 30 Min

Course Outcomes (CO)

Student Will be able to

1.	Describe the communication system and analyze different types of noise.
2.	Analyze different analog modulation techniques.
3.	Demonstrate the knowledge of transmission and reception.
4.	Correlate different pulse communication system by using Sampling theorem

	Course Contents	**Hours**
Unit 1	**Communication System and Noise:** Communication system, need and types of modulation; noise - classification, sources, due to several amplifiers in cascade, reactive circuits; noise figure-calculation and from measurement; noise temperature.	**(8)**
Unit 2	**Amplitude Modulation:** Amplitude modulation (AM) - mathematical analysis, modulation index, Frequency spectrum, power equation, efficiency, generation (Collector and Emitter modulator), transmitter, high and low level transmitter, balanced modulator (using FET, BJT): Single Side Band (SSB) generation - filter method and phase shift method; Vestigial Side Band (VSB) modulation forms of AM, Independent Side Band scheme (ISB).	**(8)**
Unit 3	**Angle Modulation:** Frequency Modulation (FM), mathematical Analysis, modulation index, frequency spectrum, power requirement of FM, narrowband & wideband FM, pre-emphasis and de-emphasis techniques, phase modulation, power contents of the carrier & the sidebands in angle modulation, generation of FM signals, comparison between AM & FM. FM; Phase modulation (PM) -mathematical analysis.	**(8)**
Unit 4	**Demodulators:** AM detectors, practical diode detector, VSB demodulation, FM demodulator – principal of slope detector, basic demodulator, balanced slope detector, phase discriminator and ratio detector.	**(4)**
Unit 5	**Radio Receivers:** Characteristics, types - Tuned Radio Frequency (TRF) , super heterodyne; AM super heterodyne receiver- RF amplifier, mixer-self and separately excited mixer, IF amplifier, practical diode detector, Automatic Gain Control (AGC) and delayed AGC; FM super heterodyne receiver-comparison with AM super heterodyne receiver, amplitude limiting, performance of amplitude limiter.	**(8)**
Unit 6	**Pulse Modulation and Multiplexing:** Sampling theorem, Types of sampling-ideal, natural, flat top sampling, generation and detection - pulse amplitude modulation (PAM), pulse width modulation (PWM), pulse position modulation (PPM), pulse code modulation. (PCM), multiplexing- frequency division multiplexing and time division multiplexing.	**(6)**

Text Books

1.	D. Kennedy, “Electronic Communication Systems”, 4th edition, Tata McGraw-Hill, 1999.
2.	Taub,Schilling and G.Saha, “Principles of Communication Systems”, 3rd edition, McGrawHill, 1995.
3.	B.P. Lathi, “Communication Systems”, BS publications.

Reference Books

1.	A. Bruce Carlson, “Communication Systems”, 4th edition, McGraw-Hill, 2006.
2.	S. Haykin, “Communication Systems”, 4th edition, John wiley& Sons, 2000.
3.	Roddy and Coolen, “Electronic Communication”, 4th edition, Prentice Hall of India, 2003.

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	2	2	1	-	-	-	-	-	-	-	1	-	1	3	-
CO 2	2	3	2	1	1	1	-	-	-	-	-	1	1	3	1
CO 3	3	2	2	2	-	1	-	-	-	-	1	1	1	3	1
CO 4	3	2	2	2	-	-	-	-	-	-	-	1	1	3	-

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	CT 1	CT 2	TA	ESE
Remember	-	-	-	05
Understand	05	-	05	35
Apply	05	05	05	10
Analyze	05	05	-	05
Evaluate	-	05	-	05
Create	-	-	-	-
TOTAL	15	15	10	60

Government College of Engineering, Karad

Second Year B. Tech. Electronics and Telecommunication Engineering (Semester – IV)

EX2404: Microcontroller and Interfacing

Teaching Scheme			Examination Scheme	
Lectures	03 Hrs/week		CT – 1	15
Tutorials	-		CT – 2	15
Total Credits	03		TA	10
			ESE	60
			Duration of ESE	02 Hrs 30 Min

Course Outcomes (CO)

Student Will be able to

1.	Establish foundation of assembly language programming & comprehensive treatment of 8051 & PIC microcontroller interfacing for engineers.
2.	Design & development of microcontroller based embedded systems.
3.	Utilize open source platforms with their libraries to develop real time applications.
4.	Design & develop IoT platform for real time applications like smart home, smart agriculture, utility of renewable energy resources.

	Course Contents	Hours
Unit 1	**8051 Controller Architecture And Instruction Set:** The CPU, Addressing modes, external addressing, Interrupt handling, Instruction execution, Instruction set – data movement; arithmetic; bit operators; branch, Software development tools like assemblers; simulators; cross-compilers, O/P file formats. 8051 – Device packaging, Chip technology, Power considerations, Reset, System clock/oscillators, Parallel I/O, Timers, Interrupts.	**(8)**
Unit 2	**PIC Microcontrollers and Instruction Set:** PIC Micro-controllers – overview: Features, PIC 16c6x/7x architecture, file selection register, Memory organization, Addressing modes, Instruction set, interrupt handling.	**(6)**
Unit 3	**Interfacings with Microcontroller:** With 8051-Memory address decoding, 8031/51 interfacing with external ROM, Flash RAM With PIC- Port structure, Interrupt structure & timers of PIC18F, PWM generation UART, Interfacing of switches, LED, LCD, Keypad, Interfacing serial port, ADC, RTC with I2C and EEPROM with SPI.	**(8)**
Unit 4	**Introduction to High Performance Controllers:** The ARM Architecture, Register Set and Modes, ARM processor core, Data Path & Instruction Decoding, Comparison of ARM Series, Intelligent Energy Management, Introduction to Exceptions, Conditional Execution, ARM Development Environment, Assembler and Compilers, Linkers and Debuggers, Software Interrupts.	**(8)**
Unit 5	**Introduction to open source platforms like Arduino, Raspberry Pi and its applications:** Introduction to arduino boards, basic types, history &IDE, Compatible shields with their libraries. Introduction to Raspberry pi boards, basic types, history &IDE, Compatible shields with their libraries.	**(6)**
Unit 6	**Applications of IoT based Raspberry Pi –** IoT Standards, IoT Platform/Architecture, Simple Case Studies.	**(6)**

Text Books

1.	Mazidi, "8051 microcontroller & embedded system" 3rdEdition ,Pearson
2.	Mazidi, " PIC microcontroller & embedded system" 3rdEdition ,Pearson
3.	Mazidi, S. Naimi, "ARM Assembly Language Programming & Architecture"

Reference Books

1.	Kenneth J.Ayala, "The 8051Micro-controller– Architecture, Programming &Applications", Penram International & Thomson Asia, Second Edition.
2.	JohnB. Peatman,"Design with PICMicro-controllers", Pearson Education Asia, LowPriceEdition
3.	ARM System-on-chip Architecture by Steve Furber, Pearson Education,ISBN978-81-317-0840-8, 2E,2012
4.	Massimo Banzi, "Getting Started with Arduino"

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	2	2	1	-	1	-	-	-	-	-	-	1	1	1	2
CO 2	2	3	3	2	1	-	-	-	1	-	-	1	1	1	2
CO 3	2	2	1	-	1	-	-	-	-	-	-	1	1	1	2
CO 4	3	3	2	2	1	1	-	-	1	-	1	1	1	1	2

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	CT 1	CT 2	TA	ESE
Remember	05	-	-	05
Understand	05	05	05	25
Apply	05	05	05	20
Analyze	-	05	-	10
Evaluate	-	-	-	-
Create	-	-	-	-
TOTAL	15	15	10	60

Government College of Engineering, Karad

Second Year B. Tech. Electronics and Telecommunication Engineering (Semester – IV)

EX2405 : Network Analysis and Synthesis

Teaching Scheme			Examination Scheme	
Lectures	03 Hrs/week		CT – 1	15
Tutorials	-		CT – 2	15
Total Credits	03		TA	10
			ESE	60
			Duration of ESE	02 Hrs 30 Min

Course Outcomes (CO)

Student Will be able to

1.	Network Analysis and Synthesis
2.	Interpret characteristics of capacitor, inductor and compute initial conditions for current and voltage in 1st order (RC, RL) and 2nd order (RLC) circuits
3.	Characterize, model and analyze the network in terms of network functions and find various parameters of two port networks
4.	Design different types filters

	Course Contents	Hours
Unit 1	**Network Fundamentals**: Basic Definitions: Passive Network, Active Network, Linear Element, nonlinear elements, Unilateral, bilateral, lumped & distributed elements. Representation of voltage & current sources (Ideal & practical), source transformation, series & parallel connection of passive elements(R,L,C), Star- Delta transformation, KVL, KCL, reduction of networks: Mesh, Node analysis, supernode and supermesh analysis.	**(6)**
Unit 2	**Network Theorems:** D.C. and A.C. network solution using dependent/controlled and independent sources using generalized loop and node matrix methods, Superposition Theorem, Millman's Theorem, Norton's Theorem, Thevenin's Theorem, Maximum Power Transfer Theorem.	**(6)**
Unit 3	**Transient Response:** Network Solution using Laplace transforms, Initial and final Conditions of elements. Steady state & transient response (Voltage & Current) DC response of RL circuit, DC response of RC circuit, DC response of RLC circuit, Sinusoidal response of RL, RC & RLC circuit.	**(6)**
Unit 4	**Two port networks and network functions:** Two port network: Z, Y, H, ABCD parameters, Interrelation of different parameters, Interconnections of two port network, Network Functions: Network functions for one port & two port networks, Driving point impedance and admittance of one port network, Driving point impedance, admittance & different transfer function of two port network, Concept of complex frequency, significance of poles & zeros. Restrictions on poles & zeros for transfer & driving point functions, stability concept in passive circuit using Routh- Hurwitz criterion, pole zero diagram.	**(8)**
Unit 5	**Synthesis of RLC circuits:** Realizability theory and synthesis of one-port networks: Causality & stability, Hurwitz polynomials, positive real functions, elementary synthesis procedures, properties & synthesis of L-C, R-C, & R-L one port circuits, synthesis of certain R-L-C functions.	**(8)**
Unit 6	**Filter Design:** Aspects of filter design problem, approximation problem in network theory, maximally flat low pass filter approximation (Butterworth), Chebyshev approximations, Synthesis of Low pass filters, magnitude and frequency normalization, frequency transformation, Design of Low Pass, High Pass, Band Pass and Band Stop filters.	**(8)**

Text Books

1.	Franklin Kuo, "Network Analysis and Synthesis". Wiley international
2.	A.Chakrabarti, "Circuit Theory (Analysis & Synthesis)", IIIrd Edition Dhanpat Rai & co.
3.	M.E.Van Valkenburg, "Network Analysis", IIIrd Edition, Pearson Education/PHI

Reference Books

1.	A.Sudhakar,Shyammohan S.Palli, "Circuit & Network – Analysis & Synthesis", IIIrd Edition –Tata McGraw Hill Publication
2.	John O' Malley, "Basic Circuit Analysis", Schaum's series
3.	Alexander & Sadiku, "Fundamentals of Electric Circuits", TMH Sixth Edition

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 6	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	3	-	-	-	-	-	-	-	-	-	-	1	2	-	-
CO 2	3	3	2	2	-	-	-	-	-	-	-	1	2	2	-
CO 3	2	3	2	2	-	-	-	-	-	-	-	1	2	2	-
CO 4	3	3	2	2	-	-	-	-	-	-	-	1	2	2	-

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	CT 1	CT 2	TA	ESE
Remember	-	-	2	-
Understand	5	4	2	10
Apply	5	6	2	15
Analyze	5	5	2	15
Evaluate	-	-	2	10
Create	-	-	-	10
TOTAL	15	15	10	60

Government College of Engineering, Karad				
Second Year B. Tech. Electronics and Telecommunication Engineering (Semester – IV)				
EX2406 : Transducers and Measurement Lab				
Laboratory Scheme			**Examination Scheme**	
Practical	2 Hrs/week		TA/CA	25
Total Credits	1		ESE	-

Course Outcomes (CO)

Student Will be able to

1.	Demonstrate measurement tools.
2.	Use sensors for measurement purpose.
3.	Design Data Acquisition Systems for real time problems.
4.	Categorize sensors in terms of their functions and parameters

	List of Experiment	
Experiment 1	To perform experiments on Transducer like thermocouple, thermistor, RTD and LVDT to study its characteristics.	
Experiment 2	To perform experiments on Resistance Temperature Detector for temperature measurement.	
Experiment 3	To perform experiments on LVDT/LDR transducer for displacement measurement.	
Experiment 4	To perform experiments on thermistor for temperature measurement.	
Experiment 5	To perform experiments on thermocouple for temperature measurement.	
Experiment 6	To perform experiments on strain gauge for temperature measurement.	
Experiment 7	To perform experiments on Pressure Gauges for pressure measurement.	
Experiment 8	To perform experiments on LCR and Q meter for measurement of different parameters like Q of a coil.	
Experiment 9	To perform experiments on distortion factor meter and determination of the % distortion of the given oscillator.	
Experiment10	To perform experiments on DAS and interfacing of DAS.	
Experiment11	To perform experiments on ADC& DAC used in DAS.	
Experiment12	To study characteristics of Spectrum Analyser.	
List of Submission		
1	Total number of Experiments: 12	
2	Total number of sheets: NA	
3	Course Project work & Report: NA	
4	Seminar report: NA	
5	Field Visit Report: NA	

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	2	2	1	2	2	-	-	-	1	-	-	1	2	1	-
CO 2	2	-	-	-	1	-	-	-	1	-	-	1	2	1	-
CO 3	2	1	3	-	2	-	-	-	1	-	-	2	2	1	-
CO 4	2	2	1	-	-	-	-	-	1	-	-	1	-	1	1

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	CA	ESE
Remember	-	-
Understand	5	-
Apply	7	-
Analyze	8	-
Evaluate	5	-
Create	-	-
TOTAL	25	-

Government College of Engineering, Karad				
Second Year B. Tech. Electronics and Telecommunication Engineering (Semester – IV)				
EX2407 : Analog Communication Lab				
Laboratory Scheme			**Examination Scheme**	
Practical	2 Hrs/week		TA/CA	25
Total Credits	1		ESE	25

Course Outcomes (CO)

Student Will be able to

1.	Construct and test analog modulation schemes for communication
2.	Analyze different receiver.
3.	Apply sampling theorem for pulse modulation.
4.	Contrast different analog modulation techniques

	List of Experiment	
Experiment 1	To perform and analyze amplitude modulation.	
Experiment 2	To perform and analyze amplitude demodulation.	
Experiment 3	Perform and analyze balanced modulation using IC 1496.	
Experiment 4	To perform and analyze frequency modulation (using IC/Varactor diode /BJT /FET).	
Experiment 5	To perform and analyze amplitude demodulation.(using IC/ratio detector /BJT /FET).	
Experiment 6	To perform and analyze pre emphasis and de-emphasis.	
Experiment 7	To perform and analyze different blocks in AM super heterodyne receiver.	
Experiment 8	To perform and analyze RF amplifier.	
Experiment 9	To perform and analyze IF amplifier.	
Experiment10	To perform and analyze different blocks in FM super heterodyne receiver.	
Experiment11	To perform flat top sampling.	
Project Work	Open ended theoretical course project work in the area of Analog Communication System.	
List of Submission		
1	Total number of Experiments: 11	
2	Total number of sheets: NA	
3	Course Project work & Report:01	
4	Seminar report: NA	
5	Field Visit Report: NA	

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	2	2	2	2	-	2	-	-	-	-	-	-	1	3	1
CO 2	2	3	2	2	2	2	-	-	-	-	-	-	1	3	1
CO 3	2	2	3	2	2	-	-	-	-	-	-	-	1	3	1
CO 4	3	3	3	3	3	3	-	-	-	-	-	-	1	3	1

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	CA	ESE
Remember	-	-
Understand	05	05
Apply	05	05
Analyze	05	05
Evaluate	10	10
Create	-	-
TOTAL	25	25

Government College of Engineering, Karad				
Second Year B. Tech. Electronics and Telecommunication Engineering (Semester – IV)				
EX2408 : Microcontroller and Interfacing Lab				
Laboratory Scheme			**Examination Scheme**	
Practical	2 Hrs/week		TA/CA	25
Total Credits	1		ESE	25

Course Outcomes (CO)

Student Will be able to

1.	Apply the fundamentals of assembly level programming of microcontrollers.
2.	Work with microcontroller real time interfaces including GPIO, serial ports, digital-to-analog converters and analog-to-digital converters;
3.	Examine the performance of different microcontrollers to choose suitable microcontroller for a given application.
4.	Analyze problems and apply a combination of hardware and software to address the real life problems.

	List of Experiment	
Experiments 1 & 2	Assignment exploiting the various addressing modes of 8051 for accessing internal as well as external memory and unconditional/conditional branch, loop control instructions.	
Experiment 3	Assignment exploiting Timers and its applications, PWM generation in 8051 & PIC.	
Experiment 4	Serial communication using PIC & ARM.	
Experiment 5	Interfacing of LED, LCD with PIC & ARM.	
Experiment 6	ADC, DAC interfacing using PIC & ARM.	
Experiment 7	Buzzer relay and stepper motor interface using PIC & ARM.	
Experiment 8	Interfacing LM35 with arduino.	
Experiment 9	Interfacing different sensors with Raspberry pi.	
Experiment 10	Interfacing of stepper motor & its speed control with PIC/ARM controller.	
Project Work	Open ended course project work for real life applications based on Microcontroller system/ embedded system.	
List of Submission		
1	Total number of Experiments: 10	
2	Total number of sheets: NA	
3	Course Project Work & Report: 01	
4	Seminar report: NA	
5	Field Visit Report: NA	

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	2	2	3	2	-	1	-	-	-	-	-	-	2	2	3
CO 2	2	3	2	1	1	-	-	-	-	-	-	-	2	2	3
CO 3	3	2	3	2	2	1	-	-	-	-	-	-	3	2	3
CO 4	2	2	2	2	1	-	-	-	-	-	-	-	1	2	3

Assessment Pattern **(with revised Bloom's Taxonomy)**

Knowledge Level	CA	ESE
Remember	05	
Understand	05	05
Apply	05	05
Analyze	10	05
Evaluate	-	05
Create		05
TOTAL	25	25

Government College of Engineering, Karad				
Second Year B. Tech. Electronics and Telecommunication Engineering (Semester – IV)				
EX2409 : Signals , Network Analysis and Synthesis Lab				
Laboratory Scheme			**Examination Scheme**	
Practical	2 Hrs/week		TA/CA	25
Total Credits	1		ESE	25

Course Outcomes (CO)

Student Will be able to

1.	Summarise network theorems for DC/AC circuits
2.	Find desired response of RC, RL and RLC circuits for given input
3.	Model two port network and find various parameters, driving point and transfer functions of two port network
4.	Design various types of filters as per real time requirements.

	List of Experiment	
	Signals and Systems	
Experiment 1	Introduction to MATLAB, understand various functions in MATLAB, programming using MATLAB	
Experiment 2	Introduction to MATLAB, understand various functions in MATLAB, programming using MATLAB	
Experiment 3	Signal graph plotting and study the use of n lable and y lable, Basic Operation of signal, To study the Periodicity.	
Experiment 4	Program for signal operations on Trigonometric Signal: Time Shifting, Time Scaling, Amplitude Shifting, Combined Operations.	
Experiment 5	For given signal x1(t) and x2(t) find its even and odd component and show that the original signal is addition of even and odd signals.	
Experiment 6	Sawtooth Wave Generation using fourier series.	
Experiment 7	To perform convolution of discrete time signal and continuous time signal.	
Experiment 8	Find Laplace and inverse Laplace for given standard signal and function.	
	Network Analysis and synthesis	
Experiment 1	Perform, analyze and verify superposition theorem.	
Experiment 2	Perform, analyze and verify Thevenin/Norton theorem with dc sources.	
Experiment 3	Perform and verify Maximum power transfer theorem with dc sources.	
Experiment 4	Perform an experiment on RL and RC circuits with step voltage input and find transient response of circuits.	
Experiment 5	Perform an experiment on RLC circuit with step voltage input for underdamped, critically damped and over damped cases.	
Experiment 6	Perform an experiment on RLC circuit and determine frequency response of current in RLC circuit with sinusoidal ac input.	
Experiment 7	Perform an experiment on two port network and determine Z, Y, h and ABCD parameters for any two port network.	
Experiment 8	Perform an experiment on network functions and determine driving point and transfer functions of a two port ladder network.	
Experiment 9	Design, synthesize and verify Passive filter: Low-pass/high-pass filter, Band-pass/Band-stop filters for given filter specifications.	

Experiment 10	Design and simulate experiments relevant to the syllabus (any two) using tools like Pspice/multisim/scilab/MATLAB.	
List of Submission		
1	Total number of Experiments: 18	
2	Total number of sheets: NA	
3	Project/Dissertation Report: 00	
4	Seminar report: NA	
5	Field Visit Report: NA	

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	3	2	1	2	1	-	-	-	2	1	-	1	2	1	-
CO 2	2	2	3	2	1	-	-	-	2	1	-	1	2	1	-
CO 3	3	2	3	2	1	-	-	-	2	1	-	1	2	1	-
CO 4	3	2	3	3	1	-	-	-	2	1	-	1	2	1	-

Assessment Pattern **(with revised Bloom's Taxonomy)**

Knowledge Level	CA	ESE
Remember	-	-
Understand	05	5
Apply	05	5
Analyze	05	5
Evaluate	10	5
Create	-	5
TOTAL	25	25

Government College of Engineering, Karad

Second Year B. Tech. Electronics and Telecommunication Engineering (Semester –IV)

EX2410 : Environmental Science

Teaching Scheme			Examination Scheme	
Lectures	02 Hrs/week		CT – 1	15
Tutorials	---		CT – 2	15
Total Credits	00(Audit)		TA	10
			ESE	60
			Duration of ESE	02 Hrs 30 Min

Course Outcomes (CO)

Student Will be able to

1.	Students will explain key concepts from Economic, and Social analysis as they pertain to design and evaluation of environmental policies and institutions.
2.	Student will appreciate concepts and methods from ecological and physical sciences and their applications in environmental problem solving.
3.	Student will appreciate the ethical, cross cultural and historical context of environmental issues and the links between human and natural systems.
4.	Student will reflect critically about their roles and identities as citizens, consumers, environmental actors in a complex and interconnected world.

	Course Contents	Hours
Unit 1	**Natural Resources and Associated Problems:** Definition, scope and importance. Multidisciplinary nature of environmental studies Need for public awareness. a) Environment resources: Use and over-exploitation, deforestation, dams and their effects on forests and tribal people. b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems. c) Mineral resources: Usage and exploitation. Environmental effects of extracting and using mineral resources. d) Food resources: World food problem, changes caused by agriculture effect of modern agriculture, fertilizer-pesticide problems. e) Energy resources: Growing energy needs, renewable and nonrenewable energy resources, use of alternate energy sources. Solar energy, Biomass energy, Nuclear energy. f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.	**(06)**
Unit 2	**Ecosystems:** Concept of an ecosystem. Structure and function of an ecosystem. Producers, consumers and decomposers. Energy flow in the ecosystem. Ecological succession. Food chains, food webs and ecological pyramids. Introduction, types, characteristics features, structure and function of the following ecosystem :- a) Forest ecosystem, b) Grassland ecosystem, c) Desert ecosystem, d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).	**(06)**
Unit 3	**Biodiversity and its conservation :** Introduction-Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. India as a mega-diversity nation. Western Ghat as a biodiversity region. Hot-spot of biodiversity. Threats to biodiversity habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	**(06)**
Unit 4	**Environmental Pollution:** Definition: Causes, effects and control measures of: Air pollution, Water pollution, soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards. Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of a individual in prevention of pollution.	**(06)**
Unit 5	**Social Issue and Environment:** Disaster management: floods, earthquake, cyclone, tsunami and landslides. Urban problems related to energy Water conservation, rain water harvesting, watershed management Resettlement and rehabilitation of people; its problems and concerns. Environmental ethics: Issue and possible solutions. Global warming, acid rain, ozone layer depletion, Social Environment, sustainability nuclear accidents and holocaust. Wasteland exclamation. Consumerism and waste products.	**(06)**

Unit 6	**Environmental Protection :** From Unsustainable to Sustainable development. Environmental Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Population Growth and Human Health, Human Rights, Environment Impact Assessment, Green Tribunals.	**(06)**

Tutorials	
	Visit to a local area to document environmentalassets-river/Forest/Grassland/Hill/Mountain. OR Visit to a local polluted site -Urban / Rural / Industrial/Agricultural. OR Study of common plants, insects, birds.
Text Books	
1.	Text Book of Environmental Studies by Dr. P.D. Raut from Shivaji University. (Edition 2013)
2.	Concise Environmental Studies by Dr. Madhukar Bachulkar, B.V.Kulkarni,Sharvil A Shah R.K Publications (Edition 2014)
3.	Miller T.G. Jr., Environmental Science. Wadsworth Publications Co. (Edition 2007)
Reference Books	
1.	Agarwal, K.C.2001, Environmental Biology, Nidi Pub. Ltd., Bikaner. (Edition 2011)
2.	Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahemdabad 380013 India (Edition 2008)
3.	Cunningham, W.P. Cooper, T.H.Gorhani, E. & Hepworth, M.T.2001, Environmental Encyclopedia, Jaico Pub. Mumbai, 1196p (Edition 2010)
4.	De A.K., Environmental Chemistry, Wiley Wastern Ltd. (Edition 2014)
5.	Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, vol. I and II, Environmental Medi
Useful Links	
1.	www.mpcb.gov.in
2.	www.cpcb.nic.in
3.	www.downtoearth.org.in

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	1	-	2	-	1	1	1	-	-	-	2	1	-	-	-
CO 2	2	-	1	-	2	1	2	-	-	-	-	1	-	-	-
CO 3	1	-	1	-	1	1	2	-	-	-	1	1	-	-	-
CO 4	1	-	2	-	1	1	1	-	-	-	-	2	-	-	-

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	CT 1	CT 2	TA	ESE
Remember	3	3	1	12
Understand	3	3	1	12
Apply	3	3	2	12
Analyze	3	3	2	12
Evaluate	3	3	2	12
Create			2	
TOTAL	15	15	10	60

Government College of Engineering, Karad

Second Year B. Tech. Electronics and Telecommunication Engineering (Semester –IV)

EX2411 : Technical Presentation

Teaching Scheme			Examination Scheme	
Lectures	-		CT – 1	-
Tutorials	01 Hr./week		CT – 2	-
Total Credits	01		TA	25
			ESE	
			Duration of ESE	

Course Outcomes (CO)

Student Will be able to

1.	Understand the importance of presentations and their inherent problems and Identify the audience, purpose, Organization, flow, style, and delivery of presentations.
2.	Cite and refer IEEE transaction publications, presentation resources and data and use advanced presentation software packages to prepare report and presentation..
3.	Control nerves and deliver a presentation with confidence and authority.
4.	Understand how to deal with questions from the audience

	Course Contents	Hours
Technical Presentation	In this course, students will carry literature review of 10 IEEE transaction papers of current year in the area of their interest in Electronics and Telecommunication domain. Student will prepare literature review report which will be consisting of methodology/strategy/algorithms, findings, conclusions, limitations given in each paper. In executive summary of report student will do gap analysis and will give their suggestions to remove the gaps. The students will develop the oral presentation skills needed to present technical research findings in Literature Review. Students are expected to give a fifteen-minute presentation related to their report. This presentation will be in English. Students will focus on the language needed during each part of the presentation (opening, outline, background, materials/methods, results, discussion, summary, and Q&A). By analyzing the language used in a model presentation given at a real-world engineering conference, students will learn many of the common features of presentation language and develop confidence to deliver their own presentations in English. Students will also practice the target language through a series of short pair and group activities, and work toward a final presentation related to their field of interests. It will accurately reflect the presentation that students will need to give at an academicconference.	
Tutorials		

Text Books

1	IEEE transaction papers from GCEKarad Digital Library
2	Garr Reynolds; Presentation Zen, Simple Ideas on Presentation Design and Delivery; New Riders publication, 2nd Edition
3	Edward R. Tufte; The Visual Display of Quantitative Information, Graphic Press, 2nd Edition

Reference Books

1.	Brian Tracy; How to Present With Power in Any Situation, McGraw-Hill publication

Mapping of COs and POs

PO → CO ↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	3	1			3	1	2		3	3	2	2	1		
CO 2						1		1	2	3	1	3			
CO 3	3				2			1	2	1		3	2		
CO 4	1	1						1	2	3		3			

Assessment Pattern (with revised Bloom's Taxonomy)

Knowledge Level	CT 1	CT 2	TA	ESE
Remember	-	-	8	-
Understand	-	-	8	-
Apply	-	-	3	-
Analyze	-	-	2	-
Evaluate	-	-	2	-
Create	-	-	2	-
TOTAL	-	-	25	-