Year: First Year **Semester: I**
Course: Applied Mathematics **Course Code: TDBS101**

Teaching Scheme (Hrs/Week)				Continuous Internal Assessment (CIA)					End Semester Examination		Total
L	**T**	**P**	**C**	**CIA-1**	**CIA-2**	**CIA-3**	**CIA-4**	**Lab**	**Theory**	**Lab**	
3	1	-	4	10	20	10	10	----	50	----	100
Max. Time, End Semester Exam (Theory) -3Hrs.									**End Semester Exam (Lab) - ----**		

Prerequisite

1. Basic knowledge of fundamental mathematics.
2. Different Application of Mathematics

Course Objectives	
1.	To be familiar with linear differential equations of higher order applicable to control systems.
2.	To study complex functions, conformal mappings, contour integration applicable to electrostatics, digital filters, signal and image processing.
3.	To study differentiation and integration vectors.
4.	To be familiarize with Z- transform and their applications.
5.	To be thorough with applications to control systems and signal processing.

Course Content			
Unit No.	Module No.	Content	Hours
1	**I**	**Linear Differential Equations** :- Solution of linear differential equations of first order, solution of nth order linear differential equations with constant coefficients.	7
	II	**Applications of Linear Differential Equations:** Method of variation of parameters, applications in simple electrical circuit.	5
2	**I**	**Laplace Transform:** Laplace transforms, properties and Theorems on them, Laplace transform of standard functions, inverse Laplace transform.	6
	II	**Laplace transform of standard functions**: Laplace transform of some special functions like - periodic, unit step, unit impulse; applications of Laplace transform for solving differential equations.	6
3	**I**	**Z - Transform:** Introduction and definition of Z - Transform, standard properties of Z - Transform, Z - Transform of standard sequences and their region of convergence.	8
	II	**Inverse Z - Transform:** Inverse Z-transform, solution of difference equations by using Z-Transform.	4
4	**I**	**Vector Differentiation**: Basics of vector differentiation, vector differential operator, gradient, divergence and curl, directional	7

		derivative, solenoidal, irrotational fields, scalar potential.	
	II	**Vector Integration:** Standard vector identities, line integral, Green's Lemma and its applications	5
5	**I**	**Complex Variables:** Functions of complex variables, analytic functions, Cauchy-Riemann equations, Cauchy's integral Theorem	8
	II	**Complex Variables (continued):** Cauchy's integral Theorem, Cauchy's integral formula, residue Theorem, bilinear transformation.	4
		Total No. of Hrs	60

Beyond the Syllabus
1. Introduction of Fourier series and Fourier transforms. 2. Solutions of simultaneous linear equations. 3. Gauss divergence theorem and stokes theorem

Course Outcome	
Students should able to	
CO1	Solve linear differential equations and apply them on simple electric circuit.
CO2	Gain the basic knowledge of Laplace transform and their applicability in solving initial value problems.
CO3	Understands the new notion of Z- transform and their usability in solving difference equations.
CO4	Solve the problems on vector derivatives and integrations.
CO5	Gain the knowledge of complex analysis and its application electrical engineering problem.

RecommendedResources	
Text Books	1. Ervin Kreyszig, Advanced Engineering Mathematics, 10th edition, John Wiley and Sons. 2. S.R.Sakhare, B.S.Waghe, S. M. Bhati, Naveen Mani, Engineering Mathematics- III (Electrical & Instrumentation Branch), Gigatech Publishing House, Pune [ISBN: 978-81-938081-0-8]
Reference Books	1.B. S. Grewal, Higher Engineering Mathematics, 43rd edition, Khanna Publishers.
E-Resources	http://nptel.ac.in/syllabus/108106070/

Year: First Year **Semester: I**
Course: Basic Electronics **Course Code: TDEC101**

Teaching Scheme (Hrs/Week)				Continuous Internal Assessment (CIA)					End Semester Examination		Total
L	**T**	**P**	**C**	**CIA-1**	**CIA-2**	**CIA-3**	**CIA-4**	**Lab**	**Theory**	**Lab**	
3	1	2	5	10	20	10	10	25	50	25	150
Max. Time, End Semester Exam (Theory) -3Hrs.									**End Semester Exam (Lab) – 2 Hrs.**		

Prerequisite	1. Basic knowledge of fundamental of semiconductor device **2.** To understand the Electronic principles as they applicable for the different application.

Course Objectives	
1	To understand operation of semiconductor devices.
2	To understand DC analysis and AC models of semiconductor devices.
3	To apply concepts for the design of Regulators and Amplifiers
4	Understand the current voltage characteristics of semiconductor devices

Course Content			
Unit No.	Module No.	Content	Hours
1	I	**Semoconductor Theory:** Material, properties of material ,Types of material ,characteristics of material, Physics of Semiconductor, Early history of semiconductor, advantages, disadvantages, application of semiconductor devices.	9
2	I	**Semiconductor Diodes and Applications:** P-N junction diode, Characteristics and Parameters, Diode approximations, DC load line analysis, Half-wave rectifier, Two-diode Full-wave rectifier, Bridge rectifier, Capacitor filter circuit (only qualitative approach), Zener diode voltage regulators: Regulator circuit with no load, Loaded Regulator. Numerical examples as applicable. LED, PHOTO DIODE	9
3	I	**Bipolar Junction Transistors:** BJT operation, BJT Voltages and Currents, BJT amplification, Common Base, Common Emitter and Common Collector Characteristics, Numerical examples as applicable. Common Emitter amplifier circuit application.	9
4	I	**BJT Biasing:** DC Load line and Bias Point, Base Bias, Voltage divider Bias, Numerical examples as applicable.	9
5	I	**Application circuit of Diode and Transistor:** Diode as a voltage regulator(Block diagram detail about each block ,IC voltage regulator(fixed and variable)),Diode as a clipper and	9

		clamper,Transistor as an amplifier,transistor as an switch.	
		Total No. of Hrs	**45**

Beyond the Syllabus
1.Introduction of basic and advanced semiconductor theory 2.Application of electronic devices.

Course Outcome	
Students should able to	
CO1	Appreciate the significance of electronics in different applications
CO2	Understand the applications of diode in rectifiers, filter circuits and wave shaping
CO3	Apply the concept of diode in rectifiers, filters circuits.
CO4	Apply the concept of transistor as an amplifier.

List of Experiments

Sr. No.	**Description**
1	Study of basic electronics laboratory(Measuring instrument)
2	V-I Characteristics of Silicon & Germanium PN Junction diodes
3	V-I Characteristics of Zener Diode
4	Characteristics of BJT in Common Emitter Configuration
5	Half Wave and Full Wave Rectifier Without Filter
6	Half Wave and Full Wave Rectifier with Filter
7	Common Emitter BJT Amplifier
8	BJT as a Switch.

Recommended Resources	
Text Books:	1. David A. Bell, “Electronic Devices and Circuits”, Oxford University Press 2. D.P. Kothari, I. J. Nagrath, “Basic Electronics”, McGraw Hill Education
Reference Books:	**1.** Basic Electronics for Scientists and Engineers by Dennis Eggleston.
E-Resources:	http://nptel.ac.in/courses/

Year: First Year **Semester: I**
Course: Applied Mechanics **Course Code: TDEC102**

Teaching Scheme (Hrs/Week)				Continuous Internal Assessment (CIA)					End Semester Examination		Total
L	**T**	**P**	**C**	**CIA-1**	**CIA-2**	**CIA-3**	**CIA-4**	**Lab**	**Theory**	**Lab**	
3	1	2	5	10	20	10	10	25	50	25	150
Max. Time, End Semester Exam (Theory) -3Hrs.									**End Semester Exam (Lab) – 2 Hrs.**		

Prerequisite	1. Basic knowledge of fundamental of physics. **2.** To understand the principles of force,energy,workdone.

Course Objectives	
1	To provide a comprehensive knowledge of force, work and energy
2	to calculate work done, power required and efficiency for various simple
3	To understand the importance and application of various laws of mechanics.

Course Content			
Unit No.	Module No.	Content	Hours
1	I	**Introduction :** Scalar and vector quantity, like force ,pressure, velocity, acceleration, Static and dynamic parameter and its conversion along with FPI AND METRIC parameter, overall application field related to the quantity and the parameter.	9
2	I	**Coplanar Concurrent Forces**: Force –units, elements Laws/Principles of forces such as Principle of Superposition, Principle of transmissibility Composition & Resolution of Forces Resultant &Equilibrium forces conditions of equilibrium Analytical & graphical method for Law of Parallelogram, Law of Triangle, Lami's law of theorem and Law of polygon.	9
3	I	**Coplanar Non Concurrent:** Forces: Principal of Moment Moment, Couple, application ,properties of couple, conditions of equilibrium Types of supports, end conditions– Hinge, free end ,roller, fix, Types of loads like point load ,U.D.L, U.V.L, Couple ,Analytical method to Evaluate reactions in statically determinate beam subjected to point load and/or U.D.L by analytical method of solving Statically determinate	9

4	I	**Centroid & Centre of Gravity**: First moment of area; to find Centroid– standard shapes ofI, L, Channel & T sections, axis of symmetry First moment of mass; to find C.G of standard solids sections, Axis of symmetry	9
5	I	**Friction**: Friction, Laws of Friction, Angle of Friction, Angle of Repose ,types of friction Application of Lami's theory and theory of resolution of forces ,example son friction for a block resting on horizontal plane &on inclined plane	9
		Total No. of Hrs	**45**

Beyond the Syllabus

1.Introduction of basic and advanced physics
2. Application of applied mechanics in different field.

Course Outcome

Students should able to

CO1	At the end of of the course students will able to solve simple problem of work and energy
CO2	At the end of of the course students will able to understand the importance and application of various laws of mechanics.

List of Experiments

Sr. No.	**Description**
1	Verify and calculate resultant force through Law of Parallelogram.
2	Verify and calculate resultant force through Law of Polygon Law of Forces, Lami's Theorem
3	Verify reactions in beam through Graphical& analytical method.
4	Calculate Centroid of lamina and Centroid of different sections
5	Calculate Coefficient of Sliding Friction for different surfaces–Wood,Glass
6	Work-out M.A & Efficiency of Simple purchase crab, simple wheel and axle, simple

Recommended Resources

Text Books:	1. **Engineering Mechanics** RS Khurmi S. Chand, New Delhi 2 Engineering Mechanics D S Kumar S. K. Kataria & Sons,
Reference Books:	**1. Engineering Mechanics Bear & Jonstan New media**
E-Resources:	http://nptel.ac.in/courses/

Year: First Year **Semester: I**

Course: Electronic Communication System **Course Code: TDEC103**

Teaching Scheme (Hrs/Week)				Continuous Internal Assessment (CIA)					End Semester Examination		Total
L	T	P	C	CIA-1	CIA-2	CIA-3	CIA-4	Lab	Theory	Lab	
3	--	2	4	10	20	10	10	25	50	25	150
Max. Time,End Semester Exam (Theory) -3Hrs.									End Semester Exam (Lab) -25 Marks		

Prerequisite	**1. Basic knowledge of Communication system** **2. Compare and analyze different modulation techniques.**

Course Objectives	
1	To analyze the Analog communication system requirements.
2	To understand the generation & detection of various analog modulation techniques.
3	To analyze the noise performance of analog modulation techniques.
4	To understand AM and FM receivers.
5	To understand the pulse modulation techniques.

Course Content			
Unit No.	Module No.	Content	Hours
1	I	**Linear Modulation schemes**: Need for modulation, conventional Amplitude Modulation (AM).Double side band suppressed carrier (DSB – SC)modulation,Hilbert transform, properties of Pre-envelop. Complex envelope representation of band pass signals, In-phase and Quadrature component representation of bandpass systems. Single side band (SSB) modulation and Modulation and demodulation of all the	9
2	I	**Angle modulation schemes**: Frequency Modulation (FM) and Phase modulation (PM), Concept of instantaneous phase and frequency. Types of FM modulation: Narrow band FM and wide band FM. FM spectrum in terms of Bessel functions. FM demodulation. Amplitude Limiter in FM.	9
3	I	**Analog pulse modulation schemes**: Sampling of continuous time signals. Sampling of low pass and band pass signals. Types of sampling. Pulse Amplitude Modulation (PAM) generation and demodulation. Pulse time modulation schemes: PWM and PPM generation and detection. Time Division Multiplexing.	9

4	I	**Transmitters and Receivers**: Classification of transmitters. High level and low level AM transmitters. FM transmitters. Principle of operation of Tuned radio frequency (TRF) and super heterodyne receivers. Selection of RF amplifier. Choice of Intermediate frequency. Image frequency and its rejection ratio Receiver characteristics: Sensitivity, Selectivity, Fidelity, Automatic Gain Control.	9
5	I	**Noise Sources and types**. Atmospheric noise, Shot noise and thermal noise. Noise temperature. Noise in two-port network: noise figure, equivalent noise temperature and noise bandwidth. Noise figure and equivalent noise temperature of cascade stages. Narrow band noise Representation. S/N ratio and Figure of merit calculations in AM.	9
		Total No. of Hrs	45

Course Outcome	
Students should able to	
CO1	Understand analog communication system.
CO2	Compare and analyze analog modulation techniques.
CO3	Calculate noise performance of analog modulation techniques.
CO4	Design AM and FM receivers.
CO5	Differentiate between pulse modulation techniques & continuous modulation.

List of Experiments

Sr. No.	**Description**
1	AM modulator and Demodulator.
2	DSB-SC modulator and Demodulator.
3	SSB Modulation and Demodulation in MATLAB.
4	FM modulator and Demodulator.
5	PAM modulator and Demodulator.
6	Simulation experiments using P-SPICE and MATLAB. (AM modulator with AWGN noise in MATLAB)
7	Pulse Width Modulation
8	Pulse Position Modulation & Demodulation
9	Spectral Characteristics of AM &FM
10	Modulation Characteristics of AM

Recommended Resources	
Text Books	I.Simon Haykin, "Communication Systems," 2/e, Wiley India, 2011. II. B.P. Lathi, Zhi Ding, "Modern Digital and Analog Communication Systems", 4/e,
Reference Books	1. P. Ramakrishna Rao, "Analog Communication," 1/e, TMH, 2011.
E-Resources	http://nptel.ac.in/

Year: First Year **Semester: I**

Course: English Communication Skill (HSS) **Course Code: TDHS111**

Teaching Scheme (Hrs/Week)				Continuous Internal Assessment (CIA)					End Semester Examination		Total
L	**T**	**P**	**C**	**CIA-1**	**CIA-2**	**CIA-3**	**CIA-4**	**Lab**	**Orals**	**Lab**	
2	-	2	**3**	10	20	10	10	-	50	-	100
Max. Time,End Semester Exam									**End Semester Orals –1 Hr.**		

Prerequisite

1. Functional grammar-Parts of speech, Tenses, Sentence pattern
2. Formal letter
3. Fluency in reading and speaking

Course Objectives	
1	To acquire basic language skills (LSRW) to communicate with speakers of English language.
2	To develop their intellectual, personal and professional abilities.
3	To develop skill to communicate fluently.
4	To enhance team building and time management skills.
5	To inculcate employability skills among students.

Course Content			
Unit No.	Module No.	Content	Hours
1	I	**English Vocabulary building:** Affixes, Prefixes & Suffixes	3
	II	Word building- Compound words, Standard Abbreviations	2
	III	Antonyms and Synonyms- functional usage	2

	IV	Active & Passive voice	2
2	I	**Writing skills:** Parts of speech	3
	II	Paragraph writing	2
	III	Use of Idioms, Phrases and Proverbs in sentences	2
	IV	Basic sentence pattern	1
	V	Importance of punctuation	1
3	I	**CALL- Computer Assisted Language Laboratory** Listening exercises- Extempore	4
	II	Vocabulary building -Task based Lab Activities	5
	III	Language fluency Linguistic accuracy & Communicative fluency	5
	IV	Listening to varied registers-Role play - Situational Dialogues	2
	V	Pronunciation, Intonation, Stress and Rhythm- Public speaking	4
4	I	**Oral & Written Presentation** Tenses	2
	II	Ice breaking, reporting, Question & answer skill	2
	III	Formal & Informal speech	3
		Total No. of Hrs	45

Beyond the Syllabus
Self Introduction, SWOT/SWOC, Group Discussion

Course Outcome	
Students should able to	
CO1	Students will acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.
CO2	Students will be able to write formal letters effectively.
CO3	Students will be able to prepare, organize and deliver oral presentation.

CO4	Students will develop reading speed and build academic vocabulary.
CO5	Students will demonstrate behavior and attitudes appropriate to university environment.

List of Experiments	
Sr. No.	**Description**
1	**Module 1** **CALL- Computer Assisted Language Laboratory** Listening exercises- Extempore
2	**Module 2** Vocabulary building -Task based Lab Activities
	Module 3 Language fluency Linguistic accuracy & Communicative fluency
	Module 4 Listening to varied registers-Role play - Situational Dialogues
	Module 5 Pronunciation, Intonation, Stress and Rhythm- Public speaking

RecommendedResources	
Text Books	1. Communication Skills by Sanjay Kumar and PushpaLata, Oxford University Press. 2. Developing Communication Skill by Krishna Mohan, MeeraBanerji, McMillan India Ltd. 3. English for Business Communication by Simon Sweeney, Cambridge University Press. 4. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press
Reference Books	1. Ethics in Engineering Practice and Research by Caroline &Whitbeck, Cambridge University Press. 2. Basic Managerial Skills by E. H. McGrath, Eastern Economy Edition, Prentice hall India. 3. Change Your Thoughts; Change Your Life by Wayne Dyer, Hay House India, ISBN-139788189988050. 4. The Power of Your Subconscious Mind by Dr Joseph Murphy MaanuGraphics , ISBN-13 9789381529560. 5. Baltra, A. (1986). "Computer assisted language learning: What is it all about?" Paper presented at a conference at the University of California, Irvine. 6. Jones, C. (1986). It's not so much the program, more what you do with it: The importance of methodology in CALL. "System, 14"(2), p.171-78. 7. Rivers, W. (Ed.). (1987) "Interactive language teaching." NY: Cambridge University Press.
E-Resources	https://www.britishcouncil.in/sites/default/files/esfe_report.pdf https://www.britishcouncil.org/sites/default/files/english-soft-skills-maghreb-research-report.pdf http://nptel.ac.in/courses/109104030/references/references.pdf http://promeng.eu/downloads/training-materials/ebooks/soft-skills/effective-communication-skills.pdf

Year: First Year **Semester: II**

Course: Basic Electrical **Course Code: TDBS201**

Teaching Scheme (Hrs/Week)				Continuous Internal Assessment (CIA)					End Semester Examination		Total
L	**T**	**P**	**C**	**CIA-1**	**CIA-2**	**CIA-3**	**CIA4**	**Lab**	**Theory**	**Lab**	
3	--	2	4	10	20	10	10	25	50	25	150
Max. Time,End Semester Exam (Theory) -3Hrs.									**End Semester Exam (Lab) - 2Hrs.**		

Prerequisite	1. Basic knowledge of fundamental of electrical theory 2. Ability to understand electrical circuits with their applications. 3. Ability to understand AC and DC circuits.

Course Objectives	
1	To provide comprehensive idea about AC and D C circuit analysis
2	To learn about working principles and applications of electrical machine.
3	To understand the concept of electrical device.

Course Content			
Unit No.	Module No.	Content	Hours
1	I	**Elementary Concepts**: Prerequisite: Concept of Potential difference. Current and resistance. Ohm's law, effect of temperature on resistance, resistance temperature coefficient, insulation resistance. SI units of work Power and Energy. Conversion of energy from one form to another in electrical and thermal systems.	9
2	I	**D. C. Circuits (Only Independent sources):** Kirchhoff's law, ideal and practical voltage and current sources. Mesh and Nodal analysis (Super node and super Mesh excluded). Source transformation. Star delta transformation. Superposition theorem, Thevevnins's theorem Norton's theorem, maximum power transfer theorem (Source transformation not allowed for superposition theorem, Mesh and Nodal analysis.	9
3	I	**A.C. Fundamentals:** Sinusoidal voltage and currents, their mathematical and graphical representation, concept of cycle period, frequency, instantaneous, peak, average, r.m.s. values, peak factor , and form factor, phase difference, lagging, leading and in phase quantities and phasor representation. Rectangular and polar representation of phasors Study of A.C circuits of pure resistance, inductance and capacitance and corresponding voltage- current phasor diagrams, voltage – current and power waveforms.	9

4	I	**Electromagnetism:** Magnetic effect of electrical current cross and dot convention, right hand thumb rule and cork screw rule, nature of magnetic field of long straight conductor, concepts of solenoid and torrid. Concepts of m.m.f, flux, flux density, reluctance, permeability and field strength, their units and relationship. Simple series and parallel magnetic circuits. , comparison between electrical and magnetic circuits , force on current carrying conductor placed in magnetic field, Fleming's left hand rule.	9
5	I	**Single phase transformer and electrostatics:** **Single phase transformers**: Construction, principle of working, e.m.f equations, voltage and current ratios, losses, definition of regulation and efficiency, determination of these by direct loading method. Descriptive treatment of autotransformer. **Electrostatics:** electrostatic field, electric flux density, electric field strength, absolute permittivity, relative permittivity and capacitance, composite dielectric capacitors, capacitors in series and parallel, energy stored in capacitors, charging and discharging of capacitors and concept of time constant.	9
	Total No. of Hrs		45

Course Outcome	
Students should able to	
CO1	To understand the basic concepts of magnetic circuits, electro magnetism and electrostatics.
CO2	To understand and analyses AC & DC circuits.
CO3	To understand the working principle and applications of DC & AC machines.

List of Experiments	
Sr. No.	**Description**
1	Mesh and nodal analysis
2	Verification of super position theorem
3	Verification of Thevevnins's theorem
4	Study of R-L series and R-C series circuit
5	R-L-C series resonance circuit
6	R-L- -C parallel resonance circuit
7	Relationship between phase and line currents and voltages.
8	OC and SC test on single phase transformer

Recommended Resources	
Text Books	**1.** V. N. Mittal and Arvind Mittal;, " Basic Electrical Engineering" McGraw Hill
Reference Books	1. Edward Hughes, " Electrical Technology,", Pearson Education 2. . D.P. Kothari and Nagrath " Theory and Problems in electrical Engineering", PHI edition
E-Resources	http://nptel.ac.in/courses/

Year: First Year **Semester: II**

Course: Digital Electronics **Course Code: TDEC201**

Teaching Scheme (Hrs/Week)				Continuous Internal Assessment (CIA)					End Semester Examination		Total
L	**T**	**P**	**C**	**CIA-1**	**CIA-2**	**CIA-3**	**CIA-4**	**Lab**	**Theory**	**Lab**	
3	--	2	4	10	20	10	10	25	50	25	150
Max. Time,End Semester Exam (Theory) -3Hrs.									**End Semester Exam (Lab) - 2Hrs.**		

Prerequisite	1. Basic knowledge of fundamental of digital logic gates 2. Ability to understand different digital circuits with their applications. 3.Ability to understand combinational and sequential logic circuits.

Course Objectives	
1	To understand different concept of digital system with basic logic
2	Student should summarise application of types of logic circuits
3	To understand how digital system should used in advanced processor

Course Content			
Unit No.	Module No.	Content	Hours
1	I	**NUMBER SYSTEMS AND DIGITAL LOGIC FAMILIES:** Review of number systems, binary codes, error detection and correction codes (Parity and Hammingcode0- Digital Logic Families ,comparison of RTL, DTL, TTL, ECL and MOS families -operation, characteristics of digital logic family.	9
2	I	**COMBINATIONAL CIRCUITS :** Combinational logic - representation of logic functions-SOP and POS forms, K-map representations minimization using K maps simplification and implementation of combinational logic multiplexers and demultiplexers - code converters, adders, subtractions.	9
3	I	**SYNCHRONOUS SEQUENTIAL CIRCUITS:** Sequential logic- SR, JK, D and T flip flops - level triggering and edge triggering - counters -asynchronous and synchronous type - Modulo counters - Shift registers - design of synchronous sequential circuits –- Counters, state diagram; state reduction; state	9
4	I	**ASYNCHRONOUS SEQUENTIAL CIRCUITS AND PROGRAMMABLE LOGIC DEVICES :** Asynchronous sequential logic circuits-Transition table, flow table-race conditions, hazards &errors in digital circuits; analysis of asynchronous sequential logic circuits-introduction to Programmable	9

		Logic Devices: PROM – PLA –PAL.	
5	I	**VHDL:** RTL Design – combinational logic – Sequential circuit – Operators – Introduction to Packages –Subprograms – Test bench. (Simulation /Tutorial Examples: adders, counters, flip flops,	9
	Total No. of Hrs		45

Beyond the Syllabus
Student should know about basic circuits and to understand and analyse, linear and digital electronic circuits.

Course Outcome	
Students should able to	
CO1	Ability to understand and analyse digital electronic circuits.
CO2	Ability to understand and analyse, linear digital circuits
CO3	Ability to understand about digital logic to design various circuits.

List of Experiments	
Sr. No.	**Description**
1	Implementation of Boolean Functions, Adder/ Subtractor circuits.
2	Code converters: Excess-3 to BCD and Binary to Gray code converter and vice-versa
3	Counters: Design and implementation of 4-bit modulo counters as synchronous and Asynchronous
4	Study of multiplexer and demultiplexer
5	Encoders and Decoders
6	Design Full Adder and Subtractor using Gates
7	Implementation of Flip Flop
8	Shift Registers: Design and implementation of 4-bit shift registers in SISO, SIPO,

RecommendedResources	
Text Books	**1.** Floyd and Jain, 'Digital Fundamentals', 8th edition, Pearson Education, 2003.
Reference Books	1.Raj Kamal, ' Digital systems-Principles and Design', Pearson Education 2nd edition, 2007. 2. M. Morris Mano, 'Digital Design with an introduction to the VHDL', Pearson Education,2013
E-Resources	http://nptel.ac.in/courses/

Year: First Year **Semester: II**

Course: Linear Integrated Circuits **Course Code: TDEC202**

Teaching Scheme (Hrs/Week)				Continuous Internal Assessment (CIA)					End Semester Examination		Total
L	**T**	**P**	**C**	**CIA-1**	**CIA-2**	**CIA-3**	**CIA-4**	**Lab**	**Theory**	**Lab**	
3	--	2	4	10	20	10	10	25	50	25	150
Max.Time,End Semester Exam (Theory) -3Hrs.									**End Semester Exam (Lab) - 2Hrs.**		

Prerequisite	1. Basic knowledge of fundamental of Integrated Circuit. 2. Ability to understand Linear Integrated circuits with their applications. 3. Ability to understand different applications of Op-amp.

Course Objectives	
1.	To study the IC fabrication procedure
2.	To study characteristics; realize circuits; design for signal analysis using Op-amp ICs.
3.	To study the applications of Op-amp.
4.	To study internal functional blocks and the applications of special ICs like Timers.

Course Content			
Unit No.	Module No.	Content	Hours
1	I	**IC FABRICATION:** IC classification, fundamental of monolithic IC technology, epitaxial growth, masking and etching,diffusion of impurities. Realisation of monolithic ICs and packaging. Fabrication of diodes, capacitance, resistance and FETs.	9
2	I	**CHARACTERISTICS OF OPAMP:** Ideal OP-AMP characteristics, DC characteristics, AC characteristics,, differential amplifier; frequency response of OP-AMP; Basic applications of op-amp – Inverting and Non-inverting Amplifiers-V/I & I/V converters ,summer, differentiator and integrator.	9
3	I	**APPLICATIONS OF OPAMP :** Instrumentation amplifier, Log and Antilog Amplifiers, first and second order active filters, ,comparators, waveform generators, clippers, clampers, peak detector converter (R- 2R ladder and weighted resistor types), A/D converters using Op-amps.	9
4	I	**SPECIAL ICs:** Functional block, characteristics & application circuits with 555 Timer Ic-566 voltage controlled oscillator IC; 565-phase lock loop IC, Analog multiplier ICs.	9

5	I	**APPLICATION ICs:** IC voltage regulators –LM78XX,79XX Fixed voltage regulators - LM317, 723 Variable voltage regulators, switching regulator- SMPS-LM 380 power amplifier- ICL 8038 function generator IC.	9
	Total No. of Hrs		45

Beyond the Syllabus
Student should know about basic circuits and to understand and analyse, linear and different IC'S

Course Outcome	
Students should able to	
CO1	Ability to understand and analyze analog electronic circuits.
CO2	Ability to understand and analyze, linear and digital circuits

List of Experiments	
Sr.No.	**Description**
1	Timer IC application: Study of NE/SE 555 timer in Astable
2	Timer IC application: Study of NE/SE 555 timer in Monostable
3	Timer IC application: Study of NE/SE 555 timer in Bistable
4	Application of Op-Amp: inverting and non-inverting amplifier
5	Application of Op-Amp: Adder, Comparator, Integrator and Differentiator.
6	Study of VCO and PLL ICs:
7	Voltage to frequency characteristics of NE/ SE 566 IC.
8	Frequency multiplication using NE/SE 565 PLL IC.

RecommendedResources	
Text Books	**1.** David A.Bell, 'Op-amp & Linear ICs', Oxford, 2013. **2.** Ramakant A.Gayakward, 'Op-amps and Linear Integrated Circuits', IV edition, PearsonEducation, 2003 / PHI. 2000.
Reference Books	1.Fiore,"Opamps & Linear Integrated Circuits Concepts & Applications",Cengage. 2. Robert F.Coughlin, Fredrick F. Driscoll, 'Op-amp and Linear ICs', PHI Learning.
E-Resources	http://nptel.ac.in/courses/

Year: First Year **Semester: II**

Course: ELECTRONIC CIRCUITS I **Course Code: TDEC203**

Teaching Scheme (Hrs/Week)				Continuous Internal Assessment (CIA)					End Semester Examination		Total
L	**T**	**P**	**C**	**CIA-1**	**CIA-2**	**CIA-3**	**CIA-4**	**Lab**	**Theory**	**Lab**	
3	--	2	4	10	20	10	10	25	50	25	150
Max. Time,End Semester Exam (Theory) -3Hrs.									**End Semester Exam (Lab) - 2Hrs.**		

Prerequisite	**1.** Basic knowledge of fundamental of basic electronic device. 2. Ability to understand operation and application of seconducting devices.

Course Objectives	
1.	Be familiar with the structure of basic electronic devices.
2.	Be exposed to the operation and applications of electronic devices.

Course Content			
Unit No.	Module No.	Content	Hours
1	I	**PN JUNCTION DEVICES :** PN junction diode –structure, operation and V-I characteristics, diffusion and transient capacitance -Rectifiers – Half Wave and Full Wave Rectifier,– Display devices- LED, Laser diodes- Zener diode characteristics-Zener Reverse characteristics – Zener as regulator	9
2	I	**TRANSISTORS :** BJT, JFET, MOSFET- structure, operation, characteristics and Biasing UJT, Thyristor (SCR) and IGBT -Structure and characteristics.	9
3	I	**AMPLIFIERS :** BJT small signal model – Analysis of CE, CB, CC amplifiers- Gain and frequency response – small signal model– Analysis of CS and Source follower – Gain and frequency response-High frequency analysis.	9
4	I	**Transistor Modelling and Small Signal Analysis:** Transistor modeling, *r* – parameter model, the hybrid equivalent model, graphical determination of h parameters, approximate h-parameter model, analysis of CE fixed bias, voltage divider bias configuration, emitter follower configuration.	9

5	I	**JFET Biasing and MOSFET:** Construction and characteristics of JFET, specification sheet, MOSFET, biasing of JFET, depletion type and enhancement type MOSFETs, FET small signal model JFET self-bias and voltage divider bias, configuration, JFET source follower configuration, application of JFET.	9
	Total No. of Hrs		45

Beyond the Syllabus
Student should know about basic circuits and to understand characteristics and operation of Semiconductor devices.

Course Outcome	
Students should able to	
CO1	To explain the structure of the basic electronic devices.
CO2	To design applications using the basic electronic devices.

List of Experiments	
Sr. No.	**Description**
1	Characteristics of Semi conductor diode and Zener diode
2	Characteristics of a NPN Transistor under common emitter , common collector and
3	Characteristics of JFET (Draw the equivalent circuit).
4	Characteristics of UJT and generation of saw tooth waveforms.
5	Design and testing of RC phase shift, LC oscillators.
6	Single Phase half-wave and full wave rectifiers with inductive and capacitive filters.(SCR
7	Study of design consideration of oscillator (Any one type)
8	Characteristics of MOSFET and IGBT.

RecommendedResources	
Text Books	**1.** David A. Bell ,"Electronic Devices and Circuits", Prentice Hall of India,
Reference Books	1. Rashid, "Micro Electronic Circuits" Thomson publications, 2. Floyd, "Electron Devices" Pearson Asia.
E-Resources	http://nptel.ac.in/courses/

Year: First Year **Semester: I**
Course: Technical Communication Skill (HSS) **Course Code:TDHS201**

Teaching Scheme (Hrs/Week)				Continuous Internal Assessment (CIA)					End Semester Examination		Total
L	**T**	**P**	**C**	**CIA-1**	**CIA-2**	**CIA-3**	**CIA-4**	**Lab**	**Orals**	**Lab**	
2	-	2	**3**	10	20	10	10	50	50		150
Max. Time,End Semester Exam									**End Semester Orals –1 Hr.**		

Prerequisite	**4.** Functional grammar-Parts of speech, Tenses, Sentence pattern
	5. Formal letter
	6. Fluency in reading and speaking

Course Objectives	
1	To acquire basic language skills (LSRW) to communicate with speakers of English language.
2	To develop their intellectual, personal and professional abilities.
3	To develop skill to communicate fluently.
4	To enhance team building and time management skills.
5	To inculcate employability skills among students.

Course Content			
Unit	Module	Content	Hours
1	I	**English Vocabulary building:**	3
	II	Word building- Compound words, Standard Abbreviations	2
	III	Antonyms and Synonyms- functional usage	2
	IV	Active & Passive voice	2
2	I	**Writing skills:**	3
	II	Paragraph writing	2
	III	Use of Idioms, Phrases and Proverbs in sentences	2
	IV	Basic sentence pattern	1
	V	Importance of punctuation	1
3	I	**CALL- Computer Assisted Language Laboratory**	4
	II	Vocabulary building -Task based Lab Activities	5
	III	Language fluency	5
	IV	Listening to varied registers-Role play - Situational Dialogues	2
	V	Pronunciation, Intonation, Stress and Rhythm- Public speaking	4
4	I	**Oral & Written Presentation**	2
	II	Ice breaking, reporting, Question & answer skill	2
	III	Formal & Informal speech	3
		Total No. of Hrs	45

Course Outcome	
Students should able to	
CO1	Students will acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.
CO2	Students will be able to write formal letters effectively.
CO3	Students will be able to prepare, organize and deliver oral presentation.
CO4	Students will develop reading speed and build academic vocabulary.
CO5	Students will demonstrate behavior and attitudes appropriate to university environment.

List of Experiments	
Sr. No.	**Description**
1	**Module 1** **CALL- Computer Assisted Language Laboratory** Listening exercises- Extempore
2	**Module 2** Vocabulary building -Task based Lab Activities
	Module 3 Language fluency Linguistic accuracy & Communicative fluency
	Module 4 Listening to varied registers-Role play - Situational Dialogues
	Module 5 Pronunciation, Intonation, Stress and Rhythm- Public speaking

RecommendedResources	
Text Books	5. Communication Skills by Sanjay Kumar and PushpaLata, Oxford University Press. 6. Developing Communication Skill by Krishna Mohan, MeeraBanerji, McMillan India Ltd. 7. English for Business Communication by Simon Sweeney, Cambridge University Press. 8. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press
Reference Books	8. Ethics in Engineering Practice and Research by Caroline &Whitbeck, Cambridge University Press. 9. Basic Managerial Skills by E. H. McGrath, Eastern Economy Edition, Prentice hall India. 10. Change Your Thoughts; Change Your Life by Wayne Dyer, Hay House India, ISBN-139788189988050. 11. The Power of Your Subconscious Mind by Dr Joseph Murphy MaanuGraphics , ISBN-13 9789381529560. 12. Baltra, A. (1986). "Computer assisted language learning: What is it all about?" Paper presented at a conference at the University of California, Irvine. 13. Jones, C. (1986). It's not so much the program, more what you do with it: The importance of methodology in CALL. "System, 14"(2), p.171-78. 14. Rivers, W. (Ed.). (1987) "Interactive language teaching." NY: Cambridge University Press.
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