ELECTRONICS ENGINEERING DEPARTMENT

इलेक्ट्रानिक्स अभियांत्रिक विभाग

SARDAR VALLABHBHAI NATIONAL INSTITUTE OF TECHNOLOGY, SURAT

सरदार वल्लभभाई नेशनल इन्स्टीयुट ओफ टेक्नोलोजी, सुरत

क्रमांक: ECED/ / 2014-15 दिनांक: 08/01/2015

B.Tech. II (EC), III Semester

Appendix - 1

Existing Teaching Scheme

B.Tech. II(E&C), III Semester										
Sr. No.	**Course Name**	**Code**	**Teaching Scheme**			**Credit**	**Examination Scheme**			**Total**
			L	**T**	**P**		**Theory**	**Tutorial**	**Practical**	
1	Electronics Devices and Circuits	EC 201	3	1	2	5	100	25	50	175
2	Digital Logic Design	EC 203	3	1	2	5	100	25	50	175
3	Signal and Systems	EC 205	3	1	0	4	100	25	--	125
4	Engg. Mathematics-III	MH 210	3	1	0	4	100	25	--	125
5	Network Theory	EE 205	3	1	0	4	100	25	--	125
	Total		15	05	04	22	500	125	100	725
	Total Contact Hours per week									

फोन नं: संस्थान कार्यालय: २२२३३७१-७४, फेक्स नं: २२२८३९४, २२२७३३४ विभागीय प्रमुख: २२०१५५१, विभाग कार्यालय: २२०१५५२

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Appendix -2

B. Tech - II, Semester – III	**L**	**T**	**P**	**C**	
EC 201: Electronics Devices and Circuits (NEW)	**3**	**1**	**2**	**5**	

BIPOLAR JUNCTION TRANSISTOR ANALYSIS AND DESIGN	**(07 Hours)**
Analysis of CE Configuration: Current Amplification in the Transistor, Graphical Analysis of Transistor Circuits, Power Calculations, Bypass Capacitor, Coupling Capacitors, Concept of AC and DC Load Lines, Different DC Biasing Methods, Fixed Bias, Emitter Stabilized Bias, Potential Divider Bias, DC Bias with Voltage Feedback, Common Base Configuration Analysis, Emitter follower.	
FIELD EFFECT TRANSISTOR CIRCUITS	**(06 Hours)**
Bias stability in FET, Different FET Configuration, Analysis of CS, CG and CD Configuration, Voltage Biasing Techniques, Common Source Amplifier, FET Switch MOSFET Invertors.	
POWER SEMINCONDUCTOR DEVICES	**(07 Hours)**
Basic structures, Characteristics and Applications of SCR, DIAC, TRIAC, UJT, Power MOSFET and IGBT.	
SMALL SIGNAL LOW FREQUENCY ANALYSIS AND DESIGN	**(09 Hours)**
Hybrid Parameters, CE Configurations, CB Configurations, CS Configurations, CD Configuration, Impedance Reflections, Phase Splitter.	
AUDIO FREQUENCY POWER AMPLIFIER	**(06 Hours)**
Introduction To Class A, B, AB and C Operation, Class A Common-Emitter Power Amplifier, Transformer Coupled Amplifier, Class B Push-Pull Power Amplifier, Amplifiers Using Complementary Symmetry, Class C Amplifier.	
WAVESHAPING CIRCUITS	**(08 Hours)**
Linear Wave Shaping Circuits, RC High Pass and Low Pass Circuits, RC Integrator and Differentiator Circuits, Nonlinear Wave Shaping Circuits, Series-Shunt and Two level Diode Clipper Circuits, Clamping Circuits, Clamping Circuits Theorem, Practical Clamping.	
(Total Contact Time:42 Hours)	
PRACTICALS	
01) Study of BJT Characteristic.	
02) Study of BJT Biasing Methods.	
03) Study of FET Characteristics.	
04) Study of FET Biasing Methods.	
05) Study of UJT/ SCR Characteristics.	
06) Study of DIAC/ TRIAC Characteristics.	
07) Study of MOSFET Inverter.	
08) Study and Implement Common Emitter Amplifier.	
09) Study and Implement Common Source Amplifier.	
10) Study and Implement RC Low Pass and High Pass Filter Circuits.	
11) Study and Implement RC Integrator Circuits.	
12) Study and Implement RC Differentiator Circuits.	
13) MINI-PROJECT	
BOOKS RECOMMENDED	
1. Schilling Donald L. and Belove E., “Electronics Circuits- Discrete and Integrated”, McGraw-Hill, 3rd Ed., 1989, Reprint 2008.	
2. Boylestad Robert L. and Nashlesky Louis, “Electronics Device & Circuits Theory”, PHI, 10th Ed., 2009.	
3. Millman Jacob, Halkias Christos C. and Parikh C., “Integrated Electronics”, McGraw-Hill, 2nd Ed., 2009.	
4. Millman J., Taub H. and Mothiki Suryaprakash, “Pulse, Digital and Switching Waveforms”, McGraw-Hill, 2nd Ed., 2007.	
5. Kummar Annand, “Pulse and Digital Circuits”, PHI, 2nd Ed., 2008.	
6. Rasid M. H., “Power Electronics: Circuits Devices , and Applications”, Pearson Education, 3rd Ed., 2003.	

फोन नं: संस्थान कार्यालय: २२२३३७१-७४, फेक्स नं: २२२८३९४, २२२७३३४ विभागीय प्रमुख: २२०१५५१, विभाग कार्यालय: २२०१५५२

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B. Tech - II, Semester - III	**L**	**T**	**P**	**C**	
EC 203: DIGITAL LOGIC DESIGN (NEW)	**3**	**1**	**2**	**5**	

BOOLEAN ALGEBRA AND SWITCHING FUNCTIONS	**(05 Hours)**
Basic Logic Operation and Logic Gates, Truth Table, Basic Postulates and Fundamental Theorems of Boolean Algebra, Standard Representations of Logic Functions- SOP and POS Forms, Simplification of Switching Functions-K-Map and Quine-Mccluskey Tabular Methods, Synthesis of Combinational Logic Circuits.	
COMBINATIONAL LOGIC CIRCUITS USING MSI INTEGRATED CIRCUITS	**(07 Hours)**
Binary Parallel Adder, BCD Adder, Encoder Priority Encoder, Decoder, Multiplexer and Demultiplexer Circuits, Implementation of Boolean Functions using Decoder and Multiplexer, Arithmetic and Logic Units, BCD-To-Segment Decoder, Common Anode and Common Cathode, 7-Segment Displays, Random Access Memory, Read Only Memory and Erasable Programmable ROMs, Programmable Logic Arrays(PLA) and Programmable Array Logic(PAL).	
INTRODUCTION TO FLIP-FLOPS	**(06 Hours)**
Basic Concepts of Sequential Circuits, Cross Coupled SR Flip-Flop Using NAND or NOR Gates, JK Flip-Flop Rise Conditions, Clocked Flip-flops, D-Types and Toggle Flip-flops, Truth Tables and Excitation Tables for Flip-flop. Master Slave Configuration, Edge Triggered and Level Triggered Flip-flop, Elimination of Switch Bounce using Flip-flop, Flip-flop with Preset and Clear.	
SEQUENTIAL LOGIC CIRCUIT DESIGN	**(09 Hours)**
Introduction to State Machine, Mealy and Moore Model, State Machine Notation, State Diagram, State Table, Transition Table, Table Excitation, Table and Equation, Basic Concepts of Counters and Register, Binary Counters, BCD Counters, Up Down Counter, Johnson Counter, Module-N Counter, Design of Counter using State Diagrams and Tables, Sequence Generators, Shift Left and Right Register, Registers with Parallel Load, Serial -in-Parallel-Out(SIPO) and Parallel-In-Serial-Out(PISO), Register Using Different Types of Flip-flop.	
REGISTER TRANSFER LOGIC	**(05 Hours)**
Arithmetic Logic and Shift Micro-Operation, Conditional Control Statements, Fixed-Point and Floating-Point Data, Arithmetic Shifts, Instruction code and Design of Simple Computer.	
PROCESSOR LOGIC DESIGN AND CONTROL LOGIC	**(05 Hours)**
Processor Organization, Design of Arithmetic Logic Unit, Design of Accumulator, Control Organization, Hard-Wired Control, Micro Program Control, Control of Processor Unit, PLA Control.	
INTRODUCTION TO VERILOG	**(05 Hours)**
Introduction, Lexical Tokens, Gate-Level Modeling, Data Type, Operators, Operands, Modules, Behavioral Modeling, Timing Controls, Procedures, Always and Initial Blocks, Functions, Tasks, Component Interface, Registers, Flip-flop, Counter, Multiplexer, Adder/Subtracters, Tri-State Buffers.	
(Total Contact Time:42 Hours)	
PRACTICALS	
01) Half-Adder/ Half-subtarctor Circuits using a serial Input.	
02) Full-Adder/ Full-subtarctor Circuits using a serial Input.	
03) 4-Bit Gray To Binary/ Binary To Gray Code convertor using Select input.	
04) Logic expression with the Help of MUX IC 74153.	
05) Flip-flops using NAND/ NOR Gate.	
06) Modulo-7 Ripple Counter.	
07) 4-Bit Shift Left/Right Register.	
08) Sequence Generator.	
09) Excess-3 BCD Adder/ Subtractor with Select Input.	
BOOKS RECOMMENDED	
1. Mano Morris, “Digital Logic and Computer Design”, Pearson Education, 4th Ed., 2006.	
2. Jain R. P. and Anand M. H. S., “Digital Electronics Practices using Integrated Circuits”, TMH, 1st Ed., 2004.	

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3. Kime Charies R and Morris Mano, “Logic and Computer Design Fundamentals”, Pearson Education, 2nd Ed., 2004.
4. Lee Samual, “Digital Circuits and Logic Design”, PHI, 1st Ed., 1998.
5. Floyed Thomas L. and Jain R. P., “Digital Fundamentals”, Pearson Education, 8th Ed., 2006.
6. Brown S. and Zvonko Vranesic, “Fundamental of Logic with Verilog Design”, Tata McGraw Hill, 1st Ed., 2003.

फोन नं: संस्थान कार्यालय: २२२३३७१-७४, फेक्स नं: २२२८३९४, २२२७३३४ विभागीय प्रमुख: २२०१५५१, विभाग कार्यालय: २२०१५५२

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B. Tech - II, Semester - III	**L**	**T**	**P**	**C**	
EC 205: SIGNAL & SYSTEM (NEW)	**3**	**1**	**0**	**4**	

ELEMENTS OF SIGNAL SPACE THEORY	**(04 Hours)**
Signal Measure, Classification of Signals, Operation on Discrete Signals, Decimation and Interpolation, Source Standard Discrete Signals, Discrete Time Harmonics and Sinusoids.	
SAMPLING	**(05 Hours)**
Sampling Theorems, Ideal Sampling, Impulse Sampling, Natural Sampling, Signal Reconstruction and Aliasing, Sampling of Band Pass Signal.	
LINEAR TIME-INVARIENT SYSTEM	**(08 Hours)**
Discrete-Time Systems, Digital Filters, Response of Digital Filter, Solving Difference Equation, The Impulse Response, Applications-oriented Examples, Discrete Convolution, Convolution of Finite Sequences, Stability and Causality of LTI Systems, Deconvolution, Discrete Correlation.	
THE Z-TRANSFORMATION	**(11 Hours)**
The z-transformation, Properties of the Z-Transformations, Inversion of the z-transform, The One-Sided Z-transformation, Analysis of Linear-Time-Invariant Systems in the Z-Domain.	
FREQUENCY ANALYSIS OF SIGNAL AND SYSTEMS	**(06 Hours)**
Frequency Analysis of Continuous-Time Signals, Frequency Analysis of Discrete-Time Signals, Properties of The Fourier Transformation For Discrete-Time(DTFT) Signals, Frequency-Domain Characteristics Of Liner-Invariant Systems	
DISCRETE FOURIER TRANSFORM	**(06 Hours)**
Frequency Domain Sampling, The Discrete Fourier Transform(DFT), Properties of DFT, Linear Filtering Methods Based on the DFT, Frequency Analysis of Signals Using the DFT	
(Total Contact Time:42 Hours)	
BOOKS RECOMMENDED	

1. Ambardar Ashok, “Digital Signal Processing: A Modern Introduction”, Cengage Learning, 2nd Ed., 2007.

2. Prokis John G., “Digital Signal Processing: Principle, Algorithms, And Applications”, Pearson Educations, 3rd Ed.,2003.

3. Oppenheim Alan V., Wilsky Alan S. and Nawab Hamid S., “Signal and Systems, Pearson Educations, 3rd Ed., 2006.

4. Lathi B. P., “Linear Systems And Signals”, Oxford University Press, 2nd Ed., 2007.

5. Stuller John Alan, “A Introduction to Signal And Systems”, Thomson India Edition, 1st Ed., 2007.

6. Roberts M. J. and Govind Sharma, “Fundamental of Signals and Systems”, Tata McGraw-Hill, 2nd Ed., 2010.

फोन नं: संस्थान कार्यालय: २२२३३७१-७४, फेक्स नं: २२२८३९४, २२२७३३४ विभागीय प्रमुख: २२०१५५१, विभाग कार्यालय: २२०१५५२

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B. Tech - II, Semester - III	**L**	**T**	**P**	**C**	
MH 210: ENGINEERING MATHEMATICS (NEW)	**3**	**1**	**0**	**4**	

CALCULUS MULTIPLE INTEGRALS	**(08 Hours)**
Reoriented Of Concepts Of Integrals, Double And Triple Integrals, Evalution Techniques, Change of Order Of Integration, Change of Variables, Application of Double And Tripple Integrals For Evalution of Area, Volume And Mass.	
BASIC CONCEPTS OF VECTOR CALCULUS	**(08 Hours)**
Line Integrals, Scalar And Vector Point Functions, Differential Operator, Gradient Directional Derivatives, Physical Meaning Of Gradient Divergences, Cut And Laplacian With Their Properties, Surface Integral, Volume Integral, Green's, Gauss and Stokes's Theorem And Applications.	
FOURIER SERIES	**(06 Hours)**
Definition, Fourier Series With Arbitrary Period, In Particular Periodic Function With Period 2. Fourier Series Of Even and Odd Functions, Half Rang Fourier Series.	
FOURIER INTEGRAL AND TRANSFORM	**(06 Hours)**
Fourier Integral Theorem, Fourier Sine and Cosine Integral Complex Form Of Integral, Inversion Formula For Fourier Transforms, Fourier Transform of derivative Of a Functions.	
PARTIAL DIFFFERENTIAL EQUATIONS	**(06 Hours)**
Second Order PDE Of Mathematical Physics (Heat, Wave and Laplace Equation), One Dimensional With Standard Boundary Condition, Solution By Separation Of Variables Methods Using Fourier Series, Solution By Separation of Variables And Transformation Techniques.	
COMPLEX VARIABLES	**(08 Hours)**
Basic Mathematical Concepts, Analytical Functions, C-R Equations, Harmonic Functions, Its Applications, Linear Transformation Of Complex Domain, Some Special Transformation, Bilinear Transformations, Conformal Mapping and Its Applications, Complex Integration Including Contour Integration.	
(Total Contact Time:42 Hours)	
BOOKS RECOMMENDED	
1. Kreszing E., "Advance Engineering Mathematics", John Wiley Int. Student Ed., 1995.	
2. Wiely C. R., "Advance Engineering Mathematics", McGraw-Hill Int. Student Ed., 1993.	
3. O'Neil Peter, "Advance Engineering mathematics", Thompson, Singapore Ind. Ed., 2002.	
4. Greenbar Michael D., "Advance Engineering Mathematics", Pearson Singapore Ind. Ed., 2007.	
5. Ramana D. V., "Higher Engineering Mathematics", McGraw-Hill, New Delhi, 2007.	

फोन नं: संस्थान कार्यालय: २२२३३७१-७४, फेक्स नं: २२२८३९४, २२२७३३४ विभागीय प्रमुख: २२०१५५१, विभाग कार्यालय: २२०१५५२

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B. Tech - II, Semester - III	**L**	**T**	**P**	**C**	
EE 205:NETWORK THEORY (NEW)	**3**	**1**	**0**	**4**	

MESH CURRENT AND NODE VOLTAGE NETWORK ANALYSIS	**(05 Hours)**
Kichhoff's Voltage Law And Mesh Current Analysis, Mesh Equation in The Impedance Matrix Form By Inspection, Solution Of Linear Mesh Equations, Kichhoff's Current Law and Nodal Voltage Analysis Nodal Equation In The Form Of Admittance Matrices By Inspection, Solution of Linear Nodal Equations And Circuits Analysis Using Matrices.	
GRAPH THEORY AND ITS APPLICATIONS	**(05 Hours)**
Fundamental Concepts, Definition Of Graph And Various Related Terms, Paths And Circuits Connections, Tree Of a Graph, Cut Sets And Tie Sets, Non-separable Planner And Dual Graphs, Matrices of Oriented Graphs, Properties And Inter-Relationship Of Incidence, Tie Set And Cut Set Matrices, Complete Analysis Using Tie Set And Cut Set Matrices.	
NETWOK THEOREMS	**(07 Hours)**
Linearity And Superposition, Independent And Dependent Source And Their Transformations, Thevenin, Norton, Reciprocity And Maximum Power Transfer Theorems, Use of These Theorems In Circuit Analysis, Duality And Dual Of A Planner Network.	
AC/DC CIRCUIT TRANSIENTS	**(06 Hours)**
Laplace Transformation, Inverse Laplace Transformation, R-L, R-C, R-L-C Transient, Two Mesh Transient, Applications To Circuits Analysis Using Laplace Transform Methods, Initial And Final Value Theorems.	
MUTUAL INDUCTIONS	**(03 Hours)**
Magnetically Coupled Circuits And Dot Conventions, Magnetically Coupled Circuits.	
TWO PORT NETWORK ANALYSIS	**(06 Hours)**
Two Port Network Concepts, Impedances, Admittances, Hybrid And Transmission Line Parameters For Two Port Networks And Their Interrelationship, Bridge T, Parallel T and Lattice Network.	
TWO TERMINAL PAIR REACTIVE NETWORKS	**(10 Hours)**
Concepts Of Poles And Zeros Of Function, Properties Of Reactive Network, Ladder Network And Its Decomposition Into Tee, Pie, And L Sections, Image Impendence, Image Transfer Functions and Its Applications To L-C Networks, Constant K-Filters, M-Derived Filters, Composite Filters, Problems of Terminations, Lattice Filters, Bartlett's Bisection Theorem, Chebyshev Filters, Butterworth filters.	
(Total Contact Time:42 Hours)	
BOOKS RECOMMENDED	
1. Hyat W. H., Kemmerly J. E. and Durbin S. M., "Engineering Circuits Analysis", Tata McGraw-Hill, 6th Ed.,2006.	
2. Edminister Joseph A., "Schaum's Outline Series on Electric Circuits SI(Metric) Ed.", McGraw-Hill, 2nd Ed.,1983.	
3. Van Valkenburge M. E., "Network Analysis", PHI, 3rd Ed.,2002.	
4. Ghosh Samarjit, "Netowork Analysis & Synthesis", PHI 1st Ed., 2005.	
5. Wadhwa C. L., "Network Analysis & Synthesis ", New Age International Publishers, 3rd Ed., 2007.	

फोन नं: संस्थान कार्यालय: २२२३३७१-७४, फेक्स नं: २२२८३९४, २२२७३३४ विभागीय प्रमुख: २२०१५५१, विभाग कार्यालय: २२०१५५२

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B.Tech. II (E&C), IV Semester

Appendix -1

Existing Teaching Scheme

B.Tech. II(E&C), IV Semester

Sr. No.	Course Name	Code	Teaching Scheme			Credit	Examination Scheme			Total
			L	T	P		Theory	Tutorial	Practical	
1	Electronics Circuits	EC 202	3	1	2	5	100	25	50	175
2	Microprocessors	EC 204	3	1	2	5	100	25	50	175
3	Principal of Communication	EC 206	3	1	2	5	100	25	50	175
4	Electrical Technology	EE 208	3	0	2	4	100	--	50	150
5	Control Systems	EE 216	3	0	0	3	100	--	--	100
	Total		15	03	08	22	500	75	200	775
	Total Contact Hours per week									

फोन नं: संस्थान कार्यालय: २२२३३७१-७४, फेक्स नं: २२२८३९४, २२२७३३४ विभागीय प्रमुख: २२०१५५१, विभाग कार्यालय: २२०१५५२

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Appendix -3

B. Tech - II, Semester - IV	**L**	**T**	**P**	**C**	
EC 202: ELECTRONICS CIRCUITS (NEW)	**3**	**1**	**2**	**5**	

NEGATIVE FEEDBACK IN AMPLIFIER	**(08 Hours)**
Basic Concepts of Feedback Amplifier, Effect On Gain Due to Feedback, Input And Output Impedances, Feedback Amplifiers And Sensitivity Function, Voltage Series, Voltage Shunt, Current Series And Current Shunt Configuration Circuits, Details Analysis Of All The Configuration.	
FREQUENCY RESPOSE OF TRANSISTOR	**(09 Hours)**
Transistor Amplifier At Low Frequencies, R-C Coupled Amplifier With BJTs, Effect Of Emitter Bypass Capacitor, Coupling Capacitor Of Base And Collector, Transistor Amplifier At High Frequencies, Hybrid PIE Equivalent Circuit At High Frequency, High Frequency Behavior Of CE And CC Amplifier.	
OSCILLATORS	**(07 Hours)**
Barkhausen's Criteria For Oscillators, Tank Circuits Operations, Basic Transistor AF and RF Oscillators, Phase Shift, Wien Bridge, Colpitts, Hartley, Crystal And Tune Circuit Type Oscillators (AF and RF Range).	
MULTIVIBRATOR	**(07 Hours)**
Concept Of Multivibrators, Fixed Biased And Self Biased Transistor, Bistable Multivibrator, Commutating Capacitors, Schmitt Trigger, Collector-Coupled Monostable Multivibrator, Gate Width Calculation And Waveforms, Triggering Of Monoshot Multivibrator, Collector Coupled Astable Multivibrator.	
POWER ELECTRONICS CIRCUITS	**(08 Hours)**
Concept And Need Of Convertors, Operation And Analysis Of AC To DC Convertors, DC To DC Convertors And DC to AC Convertors.	
MODELING AND SIMULATION OF CIRCUITS	**(03 Hours)**
SPICE Model Of Diode, BJT, JFET, MOSFET And Analysis	
	(Total Contact Time:42 Hours)
PRACTICALS	
01) Study of Voltage Series Negative Feedback Amplifier.	
02) Study of Current Series Negative Feedback Amplifier.	
03) Study of Voltage Shunt Negative Feedback Amplifier.	
04) Study of Current Shunt Negative Feedback Amplifier.	
05) Study of Two Stage RC Coupled Amplifier.	
06) Study of Audio and RF Oscillator.	
07) Study of Bistable Multivibrator.	
08) Study of Monostable Multivibrator.	
09) Study of DC to DC convertor.	
10) Study of Single Phase Inverter Circuits.	
11) Simulation Using SPICE.	
12) MINI-PROJECT.	

फोन नं: संस्थान कार्यालय: २२२३३७१-७४, फेक्स नं: २२२८३९४, २२२७३३४ विभागीय प्रमुख: २२०१५५१, विभाग कार्यालय: २२०१५५२

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BOOKS RECOMMENDED

1.. Schilling Donald L. and Belove E., “Electronics Circuits - Discrete and Integrated”, McGraw-Hill, 3rd Ed., 1989, Reprint 2008.

2. Boylestad Robert L. and Nashlesky Louis, “Electronics Device & Circuits and Theory”, PHI, 10th Ed., 2009.

3. Millman Jacob, Halkias Christos C. and Parikh C., “Integrated Electronics”, McGraw-Hill, 2nd Ed., 2009.

4. Millman J., Taub H. and Mothiki Suryapraksh, “Pulse, Digital and Switching Waveforms”, McGraw-Hill, 2nd Ed., 2007.

5. Kumar Anand, “Pulse and Digital Circuits”, PHI, 2nd Ed., 2008.

6. Rashid M. H., “Power Electronics: Circuits, Devices, and Applications”, Pearson Education India, 3rd Ed., 2003.

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ELECTRONICS ENGINEERING DEPARTMENT

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सरदार वल्लभभाई नेशनल इन्स्टीयुट ओफ टेक्नोलोजी, सुरत

B. Tech - II, Semester - IV	**L**	**T**	**P**	**C**	
EC 204: MICROPROCESSORS (NEW)	**3**	**1**	**2**	**5**	

MICROPROCESSOR ARCHITECTURE	**(08 Hours)**
Introduction To 8-Bit 8085 Microprocessor Architecture, Operation, Memory Interfacing, Interfacing I/O Devices.	
INSTRUCTION AND TIMINGS	**(06 Hours)**
Instruction Classification, Overview Of 8085 Instruction Set Timings And Operations Of Instruction Cycle, Data Processing Example.	
PROGRAMMING METHODS AND TECHNIQUES	**(06 Hours)**
Assembly Language Programming Using Different Programming Techniques Like Looping, Counting and Indexing, Time Delay Programs, Stack And Subroutines.	
PARALLEL INPUT/OUTPUT AND PERIPHERAL INTERFACING APPLICATIONS	**(07 Hours)**
Basic Interfacing Concepts, 8255 Programmable Peripheral Interface, Interfacing Display, Keyboards, 8279 Programmable Keyboard/Display Interface, 8253/54 Programmable Timer, DMA Controller, Interrupt Controller, ADC And DAC Interfacing.	
INTRODUCTION TO 8086 MICROPROCESSOR	**(10 Hours)**
8086 Internal Architecture, Memory Segmentation, Addressing Modes, Basic Bus Timing During Read And Write Operation	
	(Total Contact Time:42 Hours)
PRACTICALS	
01) Introduction To 8085 Kit and Peripheral Boards.	
02) Program Set For Architecture Operations.	
03) Program Set For Logical And Decimal.	
04) Program Set For Subroutines And Delay.	
05) Program Set For Program Control.	
06) Interfacing With 8255.	
07) Interfacing With 8279.	
08) Interfacing With 8253.	
09) Interfacing With ADC/DAC.	
BOOKS RECOMMENDED	
1. Gaonkar R. S., “Microprocessor Architecture, Programming and Applications with 8085”, Penram International, Indian 5th Ed., 2002.	
2. Hall D., “Microprocessor And Interfacing”, Tata McGraw-Hill 2nd Ed.,2005.	
3. Ram B., “Fundamental of Microprocessor & Microcomputers”, Dhanpat Rai Publications, 6th Ed., 2003.	
4. Leventhal Lance, “Introduction to Microprocessor - Software, Hardware and Programming ”, PHI, 5th Ed., 1992	
5. Mathur A. P., “Introduction to Microprocessor”, Tata McGraw-Hill, 3rd Ed., 1996.	
6. Short K. L., “Microprocessor and Programming Logic”, Pearson Education, 2nd Ed., 2004.	

फोन नं: संस्थान कार्यालय: २२२३३७१-७४, फेक्स नं: २२२८३९४, २२२७३३४ विभागीय प्रमुख: २२०१५५१, विभाग कार्यालय: २२०१५५२

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ELECTRONICS ENGINEERING DEPARTMENT

इलेक्ट्रानिक्स अभियांत्रिक विभाग

SARDAR VALLABHBHAI NATIONAL INSTITUTE OF TECHNOLOGY, SURAT

सरदार वल्लभभाई नेशनल इन्स्टीयुट ओफ टेक्नोलोजी, सुरत

B. Tech - II, Semester - IV	L	T	P	C	
EC 206: PRINCIPAL OF COMMUNICATION (NEW)	3	1	2	5	

INTRODUCTION- SIGNAL AND SIGNAL SPACES	**(04 Hours)**
Classification Of Signals, Unit Impulse Signals Versus Vectors, Correlation Of Signals, Orthogonal Signal Set, The exponential Fourier Series, Introduction To Various Terminologies: Transmitter, Receiver, Modulation, Carrier, Channel, Etc.	
ANALYSIS AND TRANSMISSION OF SIGNALS	**(06 Hours)**
Aperiodic Signal Representation By Fourier Integral, Transmission Of Some Useful Functions, Some Properties Of The Fourier Transform, Signal Transmission Through A Linear System, Ideal Versus Practical Filter, Signal Distotion Over a Communication Channel, Signal Energy And Energy Spectral Density, Signal Power and Power spectral Density, Numerical Computation Of Fourier Transform: The DFT	
NOISE	**(03 Hours)**
Various Types of Noises: Internal(Shot, Thermal, Agitation, Transit Time) Noise and External(Atmospheric, Extra-Terrestrial, Industrial) Noise, Available Power, White Noise and Filtered Noise, AWGN Properties, Noise Equivalent Bandwidth Concept, Signal To Noise Ratio.	
AMPLITUDE MODULATION AND DEMODULATION	**(07 Hours)**
Baseband Vs Carrier Communications, DSB-C And DSB-SC Amplitude Modulation, Bandwidth Efficient AM: SSB, Vestigial Sideband (VSB) Transmission, Local Carrier Synchronization, Frequency Division Multiplexing, Phase Looked Loop And Some Applications.	
ANGLE MODULATION AND DEMODULATION	**(07 Hours)**
Nonlinear Modulation, Bandwidth Of Angle Modulated Waves, Generating FM Waves, Demodulation Of FM Signals, Effects Of Nonlinear Distortion and Interferences, Super-Heterodyne Analog AM/FM Receivers, FM Broadcasting System.	
	(Total Contact Time:42 Hours)

PRACTICALS

01) Study of The Spectrum Analyzer.

02) Study of Various Signals And Its Spectrum Using MATLAB.

03) DSB-SC And DSB-C AM Transmitter And Receiver With Tone And Voice Input.

04) FM Transmission And Reception Techniques.

05) Frequency Division Multiplexing Techniques.

06) Introduction to COMMSIM Software And Simulation Of AM and FM Models.

07) AM And FM Simulation On MATLAB With AWGN Channel And Concept of SNR.

08) Study of Various PDFs And Finding Mean And Variances.

09) LMS Estimation.

BOOKS RECOMMENDED

1. Lathi B. P., and Ding Zhi, “Modern Digital And Analog Communication Systems”, Oxford University Press, 4th Ed., 2010.

2. Proakis J. and Salehi M., “Fundamental Of Communication Systems”, PHI/Pearson Education-LPE, 2nd Ed., 2006.

3. Sharma Sanjay, “Communication System - Analog and Digital”, S. K. Kataria & Sons, 3rd Ed.,2005.

4. Carison Bruce A., “Communication Systems- An Introduction To Signal And Noise In Electrical Communication”, McGraw-Hill, 5th Ed., 2009.

5. Leon W. Couch, II “Digital And Analog Communication Systems”, Pearson Education-LPE, 6th Ed., 2004.

6. Taub Herbert and Donald Schilling, “Principal Of Communication Systems”, Tata McGraw-Hill, 2nd Ed., 2005.

फोन नं: संस्थान कार्यालय: २२२३३७१-७४, फेक्स नं: २२२८३९४, २२२७३३४ विभागीय प्रमुख: २२०१५५१, विभाग कार्यालय: २२०१५५२

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B. Tech - II, Semester - IV	**L**	**T**	**P**	**C**	
EE 208: ELECTRICAL TECHNOLOGY (NEW)	**3**	**0**	**2**	**4**	

DC MACHINE	**(08 Hours)**
Construction, Windings, EMF, Torque And Power Equations, Circuit Model, Generating And Motoring Modes, Introduction To Armature Reaction, Types Of Generators And Motors And Their Characteristics, Efficiency And Losses, Speed Control And Braking Of DC Motors.	
TRANSFORMERS	**(06 Hours)**
Review of Equivalent Circuits, No Load and Short Circuit Tests, Per Unit System, Voltage Regulation, Efficiency, Auto-Transformer, Introduction of Three Phase Transformers.	
INDUCTION MACHINE	**(05 Hours)**
Review of Equivalent Circuits, Torque Speed Characteristics, No Load and Blocked Rotor Tests, Load Test, Efficiency And Losses, Starting, Breaking and Speed Control.	
SYCHRONOUS MACHINES	**(06 Hours)**
Construction And Basic Principles, EMF Equations, Synchronous Speed, Armature Reaction, Synchronous Reactance, Voltage Regulations, Vector Diagrams For Generating And Motoring Modes, Synchronous Motor Starting, Synchronous Condensers.	
SPECIAL MACHINES	**(06 Hours)**
Theory, Performances and Applications Of Servo Motors and Stepper Motors.	
ELECTRICAL MEASUREMENT AND INSTRUMENTS	**(04 Hours)**
Principle Of Measurement of Voltage, Current, Power Energy, Electrical Parameters, Measuring Instruments.	
PRINCIPLES OF ELECTRICAL POWER SYSTEMS	**(03 Hours)**
Introduction To Generation, Transmission And Distribution Of Electrical Power.	
ECONOMIC ASPECTS OF POWER SYSTEMS	**(04 Hours)**
Coast of Generation And Supply (Tariff), Power And Its Effect on System Economy, Power Factor Improvements.	
	(Total Contact Time:42 Hours)
PRACTICALS	
01) Speed Control of DC Shunt Motors.	
02) Speed - Torque Characteristics of DC Shunt Motors.	
03) DC Series Motor N.T. Characteristics.	
04) DC Generator Characteristics.	
05) Efficiency And Regulation of 1 Phase Transformers From O.C. and S.C. Tests.	
06) Load Test On Induction Motor.	
07) Circle - Diagram.	
08) Regulation Of An Alternator By Synchronous Impedance Methods.	
09) V and Inverted V Curves.	
10) Calibration of Single Phase Energy Meter.	

फोन नं: संस्थान कार्यालय: २२२३३७१-७४, फेक्स नं: २२२८३९४, २२२७३३४ विभागीय प्रमुख: २२०१५५१, विभाग कार्यालय: २२०१५५२

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BOOKS RECOMMENDED
1. Mehta V. K., "Principle of Power System", S. Chand & Co., 2005.
2. Gupta B. R. and Singhal V., "Fundamental of Electrical Machines", New Age International(P) Ltd., 1st Ed., 2008.
3. Bimbhra P. S., "Electrical Machinery", Khanna Pub., Delhi 10th Ed., 1998.
4. Mukherjee P. K. and Chakravorti S., "Electrical Machies", Dhanpat Rai and Co., 4th Ed., 2001.
5. Sawhney A. K., "A Course In Electrical and Electronics Measurement and Instrumentations", Dhanpat Rai & Co., 2nd Ed., 2005.

फोन नं: संस्थान कार्यालय: २२२३३७१-७४, फेक्स नं: २२२८३९४, २२२७३३४ विभागीय प्रमुख: २२०१५५१, विभाग कार्यालय: २२०१५५२

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B. Tech - II, Semester - IV	**L**	**T**	**P**	**C**	
EE216: CONTROL SYSTEMS (NEW)	**3**	**0**	**0**	**3**	

BASIC CONCEPTS	**(02 Hours)**
Scope Of Control, Parts Of a Control system, Multidisciplinary Nature, Notion of Feedback, Open and Closed Loop systems.	
MODELLING AND REPRESANTATION OF CONTROL SYSTEM	**(05 Hours)**
Ordinary Differential Equations, Transfer Functions, Block Diagrams, Signal Flow Graphs, State-Space Representation.	
LINEAR SYSTEM REPRESENTATION	**(05 Hours)**
Transfer Function and Its Interpretation in terms of Impulse and Frequency Responses, Block Diagram and Signal Flow Graph Manipulations.	
PERFOMANCE AND STABILITY	**(05 Hours)**
Concept and Definition, Poles, Time Domain Response, Damping Coefficient, Natural Frequency, Overshoot, Setting Time, Rise Time, Second order Systems, Characteristics Equations and Roots, Routh-Hurwitz Criteria.	
FREQUENCY DOMAIN TECHNIQUES	**(06 Hours)**
Bandwidth and Cut-Off Rate, Link Between Time and Frequency Domain Response Feature, Stability and Relative Stability, Root-Locus Methods, Frequency Responses, Bode-Plots, Gain-Margin and Phase Margin, Nyquist Rate.	
COMPENSATOR CONCEPTS	**(05 Hours)**
Proportional, PI and PID Controllers, Lead-Lag Compensators.	
STATE-SPACE CONCEPTS	**(05 Hours)**
Controllability, Observabillity, Poles Placement Result.	
INTRODUCTION TO FUZZY CONTROL	**(04 Hours)**
Fuzzy Sets and Linguistics Variables, The Fuzzy Control Scheme, Fuzzifications And Defuzzification Methods, Examples, Comparison Between Conventional and Fuzzy Control.	
SAMPLED-DATA SYSTEMS	**(05 Hours)**
Necessity Of Sample And Hold Operations For Computer Control Sampling Theorems, Z-transform, Stability and Response of Sampled-Data Systems, Controller Design, Special Feature of Digital Control Systems.	
	(Total Contact Time:42 Hours)

BOOKS RECOMMENDED

1. Ogata K., “Modern Control Engineering”, Prentice Hall of India, 4th Ed., 2003 (UNIT I - IV).

2. Nagrath I. J. and Gopal M., “Control System Engineering”, New Age Internation Ed., 3rd Ed., 2002.

3. Behjamin C. Kuo, “Automatic Control Systems”, Prentice Hall of India, 7th Ed., 2002.

4. Gopal M., “Control System”, Tata McGraw-Hill, 1st Ed., 1997.

5. Dorf Richard and Bishop Robert, “Modern Control System Engineering”, Pearson Education, 8th Ed., 2004.

6. Bandyopadhyan M. N., “Control Engineering: Theory & Practices”, PHI, 4th Ed., Printing 2006.

7. Nice N. S., “Control System Engineering”, John Wiley & Sons, 4th Ed., 2004.

फोन नं: संस्थान कार्यालय: २२२३३७१-७४, फेक्स नं: २२२८३९४, २२२७३३४ विभागीय प्रमुख: २२०१५५१, विभाग कार्यालय: २२०१५५२

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