BOARD OF STUDIES MEETING – 2019-20

K.S.R.M COLLEGE OF ENGINEERING

AUTONOMOUS

Minutes of the Meeting

Date	**22.07.2019**	**Day**	**Monday**
Time	**10:00AM**	**Venue**	**DSP Lab**
Dept./SS	**ECE**	**Convener**	**Dr. G. Hemalatha**

MembersPresent:10				**Members Absent: 02**		
S.No	**Name**	**Designation**	**Signature**	**S.No**	**Name**	**Designation**
1.	Prof. G. Hemalatha	Prof., & HOD ECE, KSRMCE		1	Sri M. Nagendra Kumar	Alumni Member Research Staff CRL, BEL
2.	Prof. K. Rama Naidu	University nominee Professor in ECE, JNTUA, Anantapur.		2	Sri A. Valli Bhasha	Asst. Prof., in ECE KSRMCE
3.	Prof. M. Rama Subba Reddy	Subject Expert Professor in ECE IIT Madras				
4.	Dr. V. Anil Kumar	Subject Expert Asso.Prof.in ECE IIIT, Hyderabad				
5.	Dr. M. Venkatanarayana	Prof., KSRMCE				
6.	Sri R.V. Sreehari	Assoc. Prof., in ECE KSRMCE				
7.	Dr. S. L. Prathapa Reddy	Assoc. Prof., in ECE				

		KSRMCE				
8.	Sri. S. Zahiruddin	Assoc. Prof., in ECE KSRMCE				
9.	Sri Md. Mahaboob Pasha	Assoc. Prof., in ECE KSRMCE				
10	Sri B. Prabhakar	Industry S. V. P. Networks Bangalore				

Dr. G. Hemalatha, welcomed all the members to the meeting and presented the agenda.

The resolutions are:

	To do item	**Discussion**	**Resolution**	**Coordinator/in-charge**
1	To finalize the Course Structure & Syllabus	The Head of the Department has presented the syllabus designed, Including New Courses recommended Based on the Feedback given by the Stack holders and Action taken Reports and comparing with premier institute.	The committee has approved to introduce Python Programming & LAB View Programming for the current academic year. The committee has approved to modify the syllabus for the subjects, Electronic devices and circuits, Signals & Systems, Network Theory and Analog and Digital Circuits"	Dr. G. Hemalatha
2.	Certification Courses		The committee has approved to conduct the Certification Courses	Dr. S. L. Prathapa Reddy

The Head of the Department concluded the meeting with Vote of thanks.

Convener

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KADAPA - 516 003

COURSE STRUCTURE
AND
DETAILED SYLLABUS
R18 UG

DEPARTMENT OF

ELECTRONICS AND COMMUNICATION ENGINEERING

COLLEGE VISION

KSRMCE seeks to be recognized as one of the best engineering colleges in India in providing high standards of academics with most productive, creative learning environment by including research, Innovation thoughts and producing graduates with human values & leadership qualities to serve nation.

COLLEGE MISSION

M1: To provide high quality education in Engineering & Technology in order to bring out knowledgeable engineers.

M2: To creative environment a collaborative environment with stakeholders to take up need-based research and industry specific programs.

M3: To organize co-curricular and extracurricular activities for character and personality development to produce highly competent and motivated engineers and professionals to serve and lead the society.

DEPARTMENT VISION

To emerge the Electronics and Communication Engineering Department as a value based globally recognized centre ensuring academic excellence, fostering research innovation and entrepreneurial attitude.

DEPARTMENT MISSION

M1: To be a student centric institute imbibing experiential, innovative and lifelong learning skills, addressing industrial and societal problems.

M2: To promote all-inclusive research and development.

M3: To inculcate entrepreneurial attitude and values amongst the learners.

M4: To strengthen National and International, Industrial and Institutional collaborations for symbiotic relations.

PROGRAM EDUCATIONAL OBJECTIVES

PEO1: To provide students with a strong foundation in mathematics, science and engineering.

PEO2: To provide students with sufficient technical and programming skills to meet the industry demands.

PEO3: To provide students with sufficient leadership, entrepreneurship qualities, professional and ethical attitude for a successful professional career.

PEO4: To generate graduates with a multidisciplinary approach and an ability to relate engineering issues to broader social context.

PROGRAM OUTCOMES

PO1 - Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2 - Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3 - Design/Development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4 - Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5 - Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including predication and modeling to complex engineering activities with an understanding of the limitations.

PO6 - The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7 - Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8 - Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PO9 - Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10 - Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11 - Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12 - Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES

PSO1: An ability to design and conduct experiments, as well as to analyze and interpret data.

PSO2: An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

PSO3: An ability to understand the impact of engineering solutions in a global, economic, environmental and societal context.

PSO4: An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

I Semester

S. No.	Subject Code	Subject	Category	L	T	P	IM	EM	Credits
1	1821101	Mathematics - I	BSC	3	1	0	30	70	4
2	1822102	Engineering Physics	BSC	3	1	0	30	70	4
3	1823103	Basic Electrical Engineering	ESC	3	1	0	30	70	4
4	1824107	Engineering Graphics & Design	ESC	1	0	4	50	50	3
5	1825108	Engineering Physics Lab	BSC	0	0	3	50	50	1.5
6	1826106	Basic Electrical Engineering Lab	ESC	0	0	2	50	50	1
7	1827110	Workshop and Manufacturing Practices	ESC	1	0	4	50	50	3
		Total:							20.5

II Semester

S. No.	Subject Code	Subject	Category	L	T	P	IM	EM	Credits
1	1821201	Mathematics - II	BSC	3	1	0	30	70	4
2	1823202	Engineering Chemistry	BSC	3	1	0	30	70	4
3	1824203	English	HSMC	2	0	0	30	70	2
4	1805204	Programming for Problem Solving	ESC	3	0	0	50	50	3
5	1823207	Chemistry Lab	BSC	0	0	3	50	50	1.5
6	1805208	Programming for Problem Solving Lab	ESC	0	0	4	50	50	2
7	1824209	English Lab	HSMC	0	0	2	50	50	1
		Total:							17.5

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III Semester

S. No.	Subject Code	Subject	Category	L	T	P	IM	EM	Credits
1	1821301	Mathematics – III	BSC	3	1	0	30	70	4
2	1821302	Managerial Economics and Financial Analysis	HSMC	3	0	0	30	70	3
3	1821303	Electronic Devices and Circuits	EC	3	0	0	30	70	3
4	1821304	Digital System Design	EC	3	0	0	30	70	3
5	1821305	Signals And Systems	EC	3	0	0	30	70	3
6	1821306	Network Theory	EC	3	0	0	30	70	3
7	1821307	Python Programming	ESC	0	0	3	50	50	1.5
8	1821308	Electronic Devices and Circuits Lab	EC	0	0	3	50	50	1.5
9	18994M1	Environmental Science	MC	2	0	0	30		0
		Total:							22

IV Semester

S. No.	Subject Code	Subject	Category	L	T	P	IM	EM	Credits
1	1823401	Biology for Engineers	BSC	2	0	0	30	70	2
2	1804402	Probability Theory and Stochastic Processes	EC	3	0	0	30	70	3
3	1785403	Analog and Digital Circuits	EC	3	0	0	30	70	3
4	1766404	Control Systems	EC	3	0	0	30	70	3
5	1747405	Linear IC Applications	EC	3	0	0	30	70	3
6	1728406	Electromagnetic Theory and Transmission lines	EC	3	0	0	30	70	3
7	1804407	LABVIEW Programming Lab	ESC	0	0	3	50	50	1.5
8	1804408	Analog and Digital Circuits Lab	EC	0	0	3	50	50	1.5
		Total:							20

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V Semester

S. No.	Subject Code	Subject	Category	L	T	P	IM	EM	Credits
1	1804501	Microprocessors & Microcontrollers	EC	3	0	0	30	70	3
2	1804502	Digital Signal Processing	EC	3	0	0	30	70	3
3	1804503	Computer Organization	EC	2	0	0	30	70	2
4	1804504	Analog Communication	EC	3	0	0	30	70	3
5	1804505	Digital IC Applications	EC	3	0	0	30	70	3
6	1804506	Antennas and Wave Propagation	EC	3	0	0	30	70	3
7	1804507	Microprocessors & Microcontrollers Lab	EC	0	0	3	50	50	1.5
8	1804508	Analog and Digital IC Lab	EC	0	0	3	50	50	1.5
9	1804509	Socially Relevant Project	PR				100		2
		Total:							22

VI Semester

S. No.	Subject Code	Subject	Category	L	T	P	IM	EM	Credits
1	1804601	Embedded Systems	EC	3	0	0	30	70	3
2	1804602	Digital Communication	EC	3	0	0	30	70	3
3	1804603	Microwave Engineering	EC	3	0	0	30	70	3
		Professional Elective I							
4	1804604	Fiber-Optic Communication	PE	3	0	0	30	70	3
5	1804605	Data structures and Algorithms	PE	3	0	0	30	70	3
6	1804606	Digital Signal Processors & Architectures	PE	3	0	0	30	70	3
7	1804607	Analog IC Design	PE	3	0	0	30	70	3
8	1804608	Introduction to MEMS	PE	3	0	0	30	70	3
9		Open Elective I	OE	3	0	0	30	70	3

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10	1804609	Analog and digital communication Lab	EC	0	0	3	50	50	1.5
11	1804610	Digital Signal Processing Lab	EC	0	0	3	50	50	1.5
12	1804611	Micro Wave &Optical Communication Lab	EC	0	0	4	50	50	2
13	18996M1	Organizational Behaviour	MC	3	0	0	30		0
14	1804613	Internship	PR				100		2
		Total:							22

VII Semester

S. No.	Subject Code	Subject	Category	L	T	P	IM	EM	Credits
1	1804701	Internet Of Things	EC	3	0	0	30	70	3
2	1804702	Electronic Measurements & Instrumentation	EC	3	0	0	30	70	3
		Professional Elective II							
3	1804703	Information Theory & Coding	PE	3	0	0	30	70	3
4	1804704	Real Time Operating Systems	PE	3	0	0	30	70	3
5	1804705	Scientific Computing	PE	3	0	0	30	70	3
6	1804706	CMOS Design	PE	3	0	0	30	70	3
7	1804707	Electromagnetic Interference & Compatibility	PE	3	0	0	30	70	3
		Professional Elective III							
8	1804708	Radar and Satellite Communication	PE	3	0	0	30	70	3
9	1804709	Computer System Architecture	PE	3	0	0	30	70	3
10	1804710	Digital Image & Video processing	PE	3	0	0	30	70	3
11	1804711	Digital IC Design	PE	3	0	0	30	70	3
12	1804712	Cognitive Radio	PE	3	0	0	30	70	3
13		**Open Elective II**	OE	3	0	0	30	70	3

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14		**Open Elective III**	OE	3	0	0	30	70	3
15	1804713	IOT Lab	EC	0	0	2	50	50	1
16	1804714	Project Stage-I	PR	0	0	6	100	0	3
17	1824715	Human Values and Professional Ethics	MC	0	0	3	30	0	0
		Total:							22

VIII Semester

S. No.	Subject Code	Subject	Category	L	T	P	IM	EM	Credits
		Professional Elective IV							
1	1824801	Wireless Communication	PE	3	0	0	30	70	3
2	1804802	SoC Architecture	PE	3	0	0	30	70	3
3	1804803	Speech Processing	PE	3	0	0	30	70	3
4	1804804	Low Power VLSI	PE	3	0	0	30	70	3
5	1804805	RF System Design	PE	3	0	0	30	70	3
		Open Elective IV	OE	3	0	0	30	70	3
6	1804806	Technical Seminar	PR	0	0	2	100	0	1
7	1804807	Project Stage-II	PR	0	0	20	50	50	5
		Total:							12

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Course Title	ELECTRONIC DEVICES AND CIRCUITS				B. Tech. ECE III Sem		
Course Code	Category	Hours/Week			Credits	Maximum Marks	
1804303	EC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	--	--	3	30	70	100
Mid Exam Duration: 2Hrs					End Exam Duration: 3Hrs		

Course Objectives:

- To teach principles of semiconductor Physics
- To introduce electronic devices, including diodes, bipolar junction transistors and FET.
- To understand basic circuits of the electronic devices.
- To learn the biasing of BJT and FET.
- To teach small signal analysis of BJT and FET.

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	**Describe** the operation of various Diodes, transistors and their applications
CO 2	**Understand** the operation of transistor circuits under different configurations
CO 3	**Analyze** the small signal analysis of BJT Amplifiers and of FET amplifiers
CO 4	**Illustrate** the Biasing of BJT and FET.
CO 5	**Classify** the family of MOS devices.

UNIT-I

PN Junction Diode: Construction and operation of PN Junction Diode, V-I characteristics, Temperature Dependence, Static and dynamic resistance, Transition and Diffusion capacitance, Zener diode.

Diode Applications: Diode clippers and Clampers, Half wave, Full wave and Bridge Rectifiers with and without filters, Ripple factor and regulation characteristics. Applications of Zener Diode.

UNIT-II

Bipolar Junction Transistors: NPN and PNP Junction Transistors, Current components, CB, CE & CC configurations and their Input & Output Characteristics, Comparison of CE, CB and CC configurations, Saturation, Cutoff and Active regions, α, β and γ parameters and relation between them.

FET: JFET, JFET characteristics and configurations, Pinch off voltage, Drain saturation current,

Parameters of JFET, FET as Voltage Variable Resistor, Comparison between FET and BJT.MOSFET- Depletion and Enhancement types.

UNIT-III

BJT Biasing: Operating point, biasing stability, Various biasing circuits, thermal runaway, stabilization and compensation, Thermal stability, Transistor as an amplifier.

FET Biasing: Fixed bias, Self bias and voltage divider bias.

UNIT-IV

Low frequency Analysis of Transistors: Hybrid model (h-parameters), small signal analysis of a single stage BJT amplifiers, comparison of CE, CB and CC amplifiers, Approximate model analysis, effects of coupling and bypass capacitors on low frequency response.
Small signal models and analysis of JFET and MOSFET.CS, CD and CG Amplifiers and their comparison.

UNIT-V

Special Semiconductor Devices: LED, Photo diode, Photo Transistor, SCR, UJT, Tunnel diode.
Introduction to CMOS: NMOS, PMOS and CMOS-construction, operation, characteristics, advantages and comparison

Text Books:

1. Jacob Millman, Christos C. Halkias, "Integrated electronics" Tata McGraw Hill Publication
2. Adel S. Sedra and Kenneth C. Smith, "Microelectronic Circuits", Oxford University Press, 7th Edition.
3. K. R. Botkar, "Integrated Circuits" 5 th edition, Khanna Publications
4. A. Anand Kumar, "Pulse and Digital Circuits", PHI, 2005.

Reference Books:

1. Y. Tsividis and M. Colin, "Operation and Modeling of the MOS Transistor," Oxford Univ.Press, 2011.
2. D. Neamen , D. Biswas "Semiconductor Physics and Devices," McGraw-Hill Education
3. S. M. Sze and K. N. Kwok, "Physics of Semiconductor Devices," 3rd edition, John Wiley &Sons, 2006.
4. C.T. Sah, "Fundamentals of solid state electronics," World Scientific Publishing Co. Inc,1991.

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Course Title	SIGNALS AND S YSTEMS					B. Tech. ECE III Sem		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1804305	EC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	--	--	3	30	70	100
Mid Exam Duration: 2Hrs					End Exam Duration: 3Hrs			

Course Objectives:

- To introduce terminology of signals and systems.
- To present Fourier tools through the analogy between vectors and signals.
- To teach concept of sampling and reconstruction of signals.
- To present linear systems in time and frequency domains.
- To teach Laplace and z-transform as mathematical tool to analyze continuous and discrete- time signals and systems.

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	**Identify** the various signals and operations on signals.
CO 2	**Describe** the spectral characteristics of signals.
CO 3	**Illustrate** signal sampling and its reconstruction.
CO 4	**Apply** convolution and correlation in signal processing.
CO 5	**Analyze** continuous and discrete time systems.

UNIT-I

Introduction: Definition and Classification of Signals, Elementary signals, Basic operations on signals.

Fourier series representation of periodic signals: Analogy between vectors and signals, orthogonal signal space, Signal approximation using orthogonal functions, Mean square error, closed or complete set of orthogonal functions, Orthogonality in complex functions. Representation of function by a set of mutually orthogonal functions, Dirichlet"s conditions, Trigonometric Fourier series and Exponential Fourier series, Spectrum and its significance, Amplitude and Phase spectra, bandwidth of a signal.

UNIT-II

Fourier transforms: Fourier transform, Fourier transform of standard signals, properties of Fourier transforms, Fourier transforms involving impulse function, Fourier transform of periodic signals.

UNIT-III

Discrete Time Signals: Sampling of continuous time signals, Sampling theorem, Reconstruction of signal from its samples, effect of under sampling – Aliasing. Elementary sequences- Unit impulse, step, ramp, and exponential sequences, Periodicity of Discrete-time signals, Operations on Discrete-time signals.

Signal transmission through LTI systems: Systems, Classification of Systems, Linear time invariant (LTI) system, Transmission of signals through LTI systems, Transfer function of a LTI system, Causality & Stability. Distortion less transmission through LTI system, Bandwidth of systems, relation between bandwidth and rise time.

UNIT-IV

Discrete Time Systems: Definition, classification, Linear Shift Invariant(LSI) system, Stability, Causality, Linear constant coefficient difference equation, Impulse response, Discrete time Fourier transform, Properties, Transfer function, System analysis using DTFT.

Convolution and correlation: Graphical method of convolution, auto correlation and Cross correlation of functions, properties of correlation function, Energy density spectrum, Power density spectrum, Relation between convolution and correlation, Applications of convolution and correlation.

UNIT-V

Laplace Transform: Definition , ROC , Properties , Inverse Laplace transform , The S-plane and BIBO stability , Transfer functions , System response to standard signals.

Z–Transforms: Definition, ROC and its properties, analysis of LTI system using Z-transform, The Inverse Z-transform using, Z-transform properties, Unilateral Z- Transform, solution of linear constant coefficient difference equations using Z-transforms.

Text Books:

1. Simon Haykin, "Communication Systems", 2nd Edition, Wiley-Eastern,2003.
2. Oppenheim AV and Willisky, "Signals and Systems", 2nd Edition, Pearson Ed,1997.
3. B.P. Lathi, "Principles of Linear systems and signals," Oxford Univ. Press, Second Edition International version,2009.
4. Tarun Kumar Rawat, "Signals and Systems", Oxford University Press.

Reference Books:

1. Simon Haykin, Van Veen, and Wiley, "Signals & Systems", 2nd Edition,2003.
2. Luis F. Chaparro, "Signals and Systems using MATLAB," Academic Press,2011.
3. P. Ramesh Babu, R. Ananda Natarajan, "Signals and Systems", 2nd edition, SciTech Publications,2006.
4. John G. Proakis, Dimitris G. Manolakis, Digital Signal Processing, Principles, Algorithms,and Applications, 4 th Edition, PHI,2007.

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Course Title	NETWORK THEORY					B. Tech. ECE III Sem		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1804306	EC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	--	--	3	30	70	100
Mid Exam Duration: 2Hrs						End Exam Duration: 3Hrs		

Course Objectives:

- To learn network theorems,
- To teach application of resonance, transients applied for ac and dc circuits
- To study necessary conditions for network functions, various parameters and its relationships.

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	**Understand** the basic concepts of magnetic circuits,resonance and network functions.
CO 2	**Solve** DC and AC circuits by using various theorems.
CO 3	**Analyze** RL,RC and RLC for DC and AC transient response.
CO 4	**Analyze** two port networks for Z,Y,ABCD,H parameters and its relationship between them

UNIT - I

Network Theorems: Superposition theorem, Thevenin & Norton theorems, Maximum power transfer theorem, Reciprocity, Millman's and Compensation Theorems applied to DC and sinusoidal excitations.

UNIT – II

DC Transient Analysis: Determination of initial conditions – transient response of R-L, R-C & R-L-C circuits for dc–solution method using differential equation and Laplace transforms.

AC Transient Analysis: Transient response of R-L, R-C and R-L-C series circuits for sinusoidal excitations, solution method using differential equation and Laplace transforms

UNIT – III

Resonance: Series, parallel circuits, concept of half power frequencies, bandwidth and Q factor. simple problems.

Magnetic Circuits: Concept of self and mutual inductances, dot conventions, coefficient of coupling, series and parallel magnetic circuits, composite magnetic circuits.

UNIT – IV

Single port and multiport networks, immittance functions of two port parameters, necessary conditions for driving point and transfer functions, complex frequencies, poles and zeros, time domain response from pole zero plots, restrictions from pole zero locations.

UNIT – V

Two port Networks: Two port networks, impedance parameters, admittance parameters, transmission parameters, hybrid and inverse hybrid parameters, relationship between parameters, conditions for symmetry and reciprocity, interconnected two port networks, terminated two port parameters and image parameters.

Text Books

1. Van Valkenburg, "Network Analysis", PHI publications, 3rd edition.
2. Hayt and Kimmerly, "Engineering circuit analysis", McGraw Hill Publications, 7th edition.
3. Smarajit Ghosh, "Network Theory: Analysis and Synthesis", PHI Learning, 2009.
4. A.Chakrabarti, "Circuit Theory", Dhanapat Rai & Co publications.

Reference Books

1. Circuits & Networks – A. Sudhakar, Shayammohan. S. Pillai, 4th Edition –. TMH
2. Networks and Systems – D. Roy Chowdari – New Age International
3. Network Analysis with applications – Stanely - Pearson education 4th edition
4. Network Analysis by G.K.Mittal, Khanna Publishers.

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Course Title	PYTHON PROGRAMMING				B. Tech. ECE III Sem		
Course Code	Category	Hours/Week			Credits	Maximum Marks	
1805307	ESC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		--	--	3	1.5	50	50	100
						End Exam Duration: 3Hrs		

Course Objectives:

- To write, test, and debug simple Python programs.
- To implement Python programs with conditionals and loops.
- Use functions for structuring Python programs.
- Represent compound data using Python lists, tuples, dictionaries.
- Read and write data from/to files in Python.

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	**Demonstrate** the functions in Python programming.
CO 2	**Illustrate** Python programs with conditionals and loops.
CO 3	**Test** functions for structuring Python programs.
CO 4	**Design** functions for structuring Python programs.
CO 5	**Evaluate** compound data using Python lists, tuples, dictionaries.

LIST OF PROGRAMS

1. Compute the GCD of twonumbers.
2. Find the square root of a number (Newton"smethod)
3. Exponentiation (power of anumber)
4. Find the maximum of a list ofnumbers
5. Linear search and Binarysearch
6. Selection sort, Insertionsort
7. Mergesort
8. First n primenumbers
9. Multiplymatrices
10. Programs that take command line arguments (wordcount)
11. Find the most frequent words in a text read from afile
12. Simulate elliptical orbits inPygame
13. Simulate bouncing ball usingPygame

PLATFORM NEEDED

Python 3 interpreter for Windows/Linux

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Course Title	ANALOG AND DIGITAL CIRCUITS				B. Tech. ECE IV Sem		
Course Code	Category	Hours/Week			Credits	Maximum Marks	
1804403	EC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	-	--	3	30	70	100
Mid Exam Duration: 2Hrs					End Exam Duration: 3Hrs		

Course Objectives:

- To learn about multistage amplifiers, Feedback amplifiers and power amplifiers.
- To provide knowledge about working and design of oscillators.
- To teach multivibrators and time base generators.
- To know the fundamentals of logic families.

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Analyze the multistage amplifiers, feedback amplifiers and power amplifiers.
CO 2	Design sinusoidal and non-sinusoidal oscillators
CO 3	Design different multi-vibrator circuits
CO 4	Illustrate time base generators
CO 5	Understand the operation of various digital circuits

UNIT-I

High frequency analysis of transistors: The Hybrid-pi (π)- Common Emitter Transistor Model, CE short Circuit Current gain, Current gain with Resistive Load, Single Stage CE Transistor Amplifier response, Emitter follower at higher frequencies. High frequency analysis of FET-CS and CD amplifiers.

UNIT-II

Frequency Response of Amplifier: RC Low Pass Filter - RC Integrator, RC High Pass Filter - RC Differentiator, Frequency Response of BJT Amplifier, Analysis at Low and High Frequencies, Bandwidth, Gain-Bandwidth Product, Step response of an amplifier- rise time ,tilt.

Multi Stage Amplifiers: Types of coupling- RC, transformer and direct, choice of amplifier configurations, overall gain and bandwidth of n-stage amplifier, analysis of two-stage RC coupled amplifier, Darlington and Bootstrap circuits.

UNIT-III

Feedback Amplifiers: Feedback concept, classification, effects of negative feedback on gain, stability, noise, distortion, bandwidth, input and output resistances. Different types of feedback circuits.

Oscillators: Review of the basic concept, Barkhausen criterion, RC oscillators (phase shift, Wien bridge etc.), LC oscillators (Hartley, Colpitt, Clapp etc.), non-sinusoidal oscillators.

UNIT-IV

Power amplifiers: Classification of power amplifiers, Distortion in amplifiers, efficiency of class-A, class-B, class-C and class-D power amplifiers, complementary symmetry push pull power amplifier.

Tuned Amplifiers: Introduction, Q-Factor, Small Signal Tuned Amplifiers, Effect of Cascading Single Tuned Amplifiers on Bandwidth, Effect of Cascading Double Tuned Amplifiers on Bandwidth, Stagger Tuned Amplifiers, Stability of Tuned Amplifiers.

UNIT-V

Digital Logic Circuits: AND, OR & NOT gates using Diodes and transistors, Analysis of DCTL, RTL, DTL, TTL, ECL, IIL, MOS, CMOS Logic families and Comparison between the logic families.

Text Books:

1. J Jacob Millman, Christos C. Halkias, "Integrated electronics" Tata McGraw Hill Publication
2. J.Millman, H.Taub and Mothiki S. Prakash Rao, " Pulse, Digital and Switching Waveforms", TMH ,2nd Edition, 2008.
3. Herbert Taub and Donald Shilling, "Digital Integrated Electronics", McGraw Hill Publications, Indian Edition.
4. K. R. Botkar, "Integrated Circuits" 5 th edition, Khanna Publications

Reference Books:

1. P. Horowitz and W. Hill, The Art of Electronics, 2nd edition, Cambridge University Press, 1989.
2. Paul R. Gray and Robert G. Meyer, Analysis and Design of Analog Integrated Circuits, John Wiley, 3rd Edition
3. A.S. Sedra and K.C.Smith, Microelectronic Circuits, Saunder's College Publishing, Edition IV.
4. Jacob Millman, Christos Halkias, "Integrated Electronics - Analog and Digital Circuit and Systems", McGraw Hill Education; 2nd edition.

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Course Title	LABVIEW PROGRAMMING LAB				B. Tech. ECE IV Sem		
Course Code	Category	Hours/Week			Credits	Maximum Marks	
1804407	ESC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		-	-	3	1.5	50	50	100
					End Exam Duration: 3Hrs		

Course Objectives:

- 1. To write, test, and debug simple LabView programs.
- To implement LabView programs with conditional statements.
- To perform operations on arrays and strings.
- Use SubVi"s for structuring LabView programs.
- Read and write data from/to files in LabView.

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Write simple Lab view Programs
CO 2	Implement LabView programs with conditional statements.
CO 3	Perform operations on arrays and strings.
CO 4	Use SubVi"s for structuring LabView programs.

LIST OF PROGRAMS

1. Basic arithmetic operations
   (Add, mul, div, compound arithmetic, expression node, express formula and formula node)
2. Boolean operations
   (truth table verification of logic gates, Half Adder and Full Adder, convert binary to decimal value, convert BCD to Gray and Vice-Versa)
3. String operations

(Length, concatenation, insert string, sub-string, replace string, reverse string, rotate string, etc)

4. Sumof„N"numbersusingfeedbackloop(use„for"loopand„while"loop)
5. Factorial of a give number using shift register (use „for" loop and „while"loop)
6. Generate Fibonacci series for N iteration (use „for"loop)
7. Create a VI to increase the tank level from 0 to 100 & decrease the value from 100 to0 using while loop in a singleprocess.
8. Create a VI to implement and, or & not gates(or arithmetic operations) usingcase structure

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9. Build a VI that generates a 1D array of random numbers and sort the array in descending and ascending order and find the following:

a) Maximum and min value of array elements
b) Size of the array
c) Sum and product of array elements
d) Rotate array by 1position
e) Split the array after 2elements

10. Build an array of cluster controls in which each cluster consists of a numeric control and 1D numeric array. This forms the database of students. The numeric control indicates the roll no and array indicates the test marks of 4 subjects. Build the logic to modify the mark in a particular subject of a particular student. Input the roll number, subject in which mark is to be changed and new mark. Display the database on a separate array indicator.

11. Create a VI to implement Full Adder circuit using Sub VI.

12. Any application using Flat and stacked sequence

PLATFORM NEEDED

LABVIEW Software for Windows/Linux

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