LINEAR CONTROL SYSTEMS			
Course Code	21EC51	Credits	3
Course Type	Theory	CIE Marks	50
Lecture Hours(L:T:P)	3:0:0	SEE Marks	50
Total Hours	42	SEE Hours	3

Course objectives: This course will enable students to:

- To teach the fundamental concepts of Control systems and mathematical modeling of thesystem
- To study the concept of time response and frequency response of the system
- To teach the basics of stability analysis of the system

Module-1	Teaching Hours
Basic concepts: Open-loop and Closed-loop control systems. Mathematical Models of Physical Systems: Differential equations of physical systems, transfer functions, Block diagram algebra, Signal flow graphs.	9
Module-2	
Time Response Analysis: Standard test signals, Time response of first and second order systems, Effect of adding a zero to a system, Time response specifications, Steady state errors and error constants. Performance indices.	8
Module-3	
Concept of stability and algebraic criteria: The concept of stability, Necessary conditions for stability, Routh & Hurwitz stability criterions, Relative stability analysis. The Root Locus Technique: The Root Locus concept, Construction of Root Loci.	9
Module-4	
Frequency response analysis: Correlation between time and frequency response, Bode plots – General procedure for constructing Bode plots. Polar plots, Stability in frequency domain –Nyquist stability criteria, Assessment of relative stability using Nyquist criteria.	8
Module-5	
State Variable Analysis and Design: Concept of state, state variables and state models, State model for Linear continuous time systems, State variables and linear discrete-time systems, Diagonalization, Solution of state equations, Controllability and Observability.	8

Question paper pattern:

- The question paper shall have five Module for 100 marks;
- Each full question carries 20 marks.
- Two questions to be set in each module (total ten questions).
- The candidate will have to answer one full question from each module.

Note: There can be a maximum of 4 subsections in each Question.

Text Books:

1. I J Nagrath and M Gopal, Control systems and Engineering, New Age Publishers 6th Edition-2017.
2 . K Ogata, Modern Control Engineering, PHI 3rd Edition-2001

Reference Books:

1. Kuo B C, Control Engineering

E books and online course materials: NPTEL

Course outcomes:
On completion of the course, the student will have the ability to:

Course Code	CO #	Course Outcome (CO)
21EC51	CO1	Analyze physical systems using differential equations, block diagrams and signal flow graphs.
	CO2	Analyze time response of first and second ordersystems.
	CO3	Construct the root locus and analyze the stability of the system in time domain.
	CO4	Construct Bode plot, Polar plot and analyze the stability in the frequency domain.
	CO5	Obtain state models for linear systems and determine for observability and controllability.

21EC51: Linear Control Systems

CO#	Course Outcome (CO)	PO												PSO		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	Analyze physical systems using differential equations, block diagrams and signal flow graphs.	3	3	2					1		1		1	3	2	2
CO2	Analyze time response of first and second ordersystems.	3	3	2					1		1		1	3	2	2
CO3	Construct the root locus and analyze the stability of thesystem in time domain.	3	3	2		2			1		1		1	3	2	2
CO4	Construct Bode plot, Polar plot and analyze the stability in the frequency domain.	3	3	2		2			1		1		1	3	2	2
CO5	Obtain state models for linear systems and determine for observability and controllability.	3	3	2					1		1		1	3	2	3
Average		3	3	2		2			1		1		1	3	2	2.2

DIGITAL SIGNAL PROCESSING			
Course Code	21EC52	Credits	4
Course Type	Integrated	CIE Marks	50
Lecture Hours(L:T:P)	3:0:2	SEE Marks	50
Total Hours	42 (Theory)+14 Lab Slots	SEE Hours	3

Course objectives: This course will enable students to study:

- Basic concepts of digital signal processing.
- Analysis and processing of signals for different kind of applications and retrieval of information from signals.
- Design of digital filters and its realization.
- Analysis of signals using the discrete Fourier transforms (DFT) and Z-Transform.

Module	Teaching Hours
Module -1	
Discrete Fourier Transform: Representation of periodic sequences – The Discrete Fourier Series, Properties of DFS, Sampling the Z-transform, Fourier Representation of finite duration sequences – The Discrete Fourier Transform, Properties of DFT, Examples on DFT properties.	9
Module -2	
DFT Continued: Linear filtering using DFT, Filtering of long data sequences, and Frequency analysis of signals using DFT. **Computation of the Discrete Fourier Transform:** Goertzel algorithm, Decimation in Time algorithms, Decimation in Frequency algorithms, FFT algorithms for N a composite number. Chirp Z-Transform algorithm.	8
Module -3	
IIR Filters: Design of IIR digital filters from Analog filters – Impulse Invariance, Design based on numerical solution of the differential equation, Bilinear transformation, Characteristics of commonly used Analog filters, Design examples – Analog to digital Transformation. Frequency transformations. Comparison of Digital IIR and FIR filters	9
Module -4	
FIR Filters: Properties of FIR digital filters, Design of Linear phase FIR filters using windows and frequency sampling method, Design of FIR differentiators, Design of Hilbert Transforms.	8
Module -5	
Digital Filter Structures: Basic Network structures for IIR filters – Direct forms, Cascade form, Parallel form, transposed form, Lattice structures, Basic network structures for FIR Systems – Direct forms Cascade form, Networks for Linear phase FIR systems, Frequency sampling structure, Lattice structure.	8

Question paper pattern:

- The question paper shall have five Module for 100 marks;
- Each full question carries 20 marks.
- Two questions to be set in each module (total ten questions).
- The candidate will have to answer one full question from each module.

Note: There can be a maximum of 4 subsections in each Question.

Text book:

1. A.V.Oppenheim and R.W.Schafer, Digital Signal Processing, PHI.

Reference Books:

1. J.G.Proakis and D.G.Manolakis, Digital Signal Processing- Principals, Algorithms and Applications, PHI.
2. Rabiner and Gold, Theory and Applications of Digital Signal Processing, PHI
3. SanjitK.Mitra, Digital Signal- A computer- Based Approach, TMH.

List of Experiments

1. Introduction to MATLAB
2. Verification of sampling theorem
3. Generation of signals (Sinusoidal signals, Exponential signals etc.)
4. Operations on signals (Time shifting, time scaling and amplitude scaling)
5. Solution of difference equations.
6. Linear convolution, circular convolution.
7. Fourier representation of Discrete-time signals (DTFT, DFS), Properties of DTFT and DFS.
8. Discrete Fourier Transform(DFT), Properties of DFT
9. Linear filtering using DFT
10. DFT and IDFT using radix-2 FFT algorithm.
1. Design and implement digital IIR filters
12. Design and implement digital FIR filters

Course outcomes:
On completion of the course, the student will have the ability to:

Course Code	CO #	Course Outcome (CO)
21EC52	CO1	Compute the Discrete Fourier Transform (DFT) of a sequence.
	CO2	Analyze the efficient computation of DFT using Fast Fourier Transform.
	CO3	Design FIR filters using Windows and frequency sampling Techniques.
	CO4	Design digital IIR filters from Analog filters.
	CO5	Realize digital filters using Network structures.

21EC52: Digital Signal Processing

CO#	Course Outcome (CO)	PO												PSO		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1																
CO2																
CO3																
CO4																
CO5																

FIELD THEORY AND ANTENNAS			
Course Code	21EC53	Credits	3
Course Type	Theory	CIE Marks	50
Lecture Hours(L:T:P)	3:0:0	SEE Marks	50
Total Hours	42	SEE Hours	3

Course Objectives: The objectives of the course is to enable students:

- To understand the theory of vector analysis
- To understand the concepts of electrostatics, electrical potential, energy density and their applications.
- To analyze the concepts of magneto statics, magnetic flux density, scalar and vector potential and its applications
- To explore Biot Savart's Law, Ampere's Law, Faraday's Laws, and Maxwell'sequations

Module	Teaching Hours
Module-1	
Electric field intensity: Electric field due to continuous volume charge, line charge, sheet charge. Electric flux density, Gauss law and Divergence: electric flux density, Gauss law and its applications, divergence theorem. **Energy and potential:** Energy and potential in a moving point charge in an electric field, line integral, potential difference and potential, potential field of a point charge, The potential field of a system of charges- conservative property, potential gradient, the dipole, Laplace and Poisson's equations.	9
Module-2	
Magnetic Fields: Steady Magnetic fields: Biot savart's law, Ampere's circuital law, Curl. Stokes theorem, magnetic flux and flux density, magnetic force between differential current elements , magnetic boundary conditions **Time varying fields and Maxwell's equations**: Faraday's law, displacement current, Maxwell's equations in point form and integral form, the retarded potentials.	8
Module-3	
Introduction to Antenna: Principle of radiation, isotropic radiator, radiation resistance, radiation pattern, beam width, bandwidth, directivity, gain, effective length of an antenna, relationship between gain and radiating efficiency, power gain, Frii's transmission formula.	8
Module-4	
Antenna arrays: Point sources, two element arrays of equal amplitude and same phase, equal amplitude and opposite phase and unequal amplitude and any phase, broad side and end fire arrays, multiplication of patterns, Binomial arrays, Effectof earth on vertical pattern	8
Module-5	
Antenna Measurement: Methods of measuring impedance, field pattern, gain and directivity. **Antenna Types**: Yagi-Uda antenna, folded dipole antenna, parabolic reflectors, loop antenna, Helical antenna, horn antenna, patch antenna,slot antenna	9

Question paper pattern:

- The question paper shall have five Module for 100 marks;
- Each full question carries 20 marks.
- Two questions to be set in each module (total ten questions).
- The candidate will have to answer one full question from each module.

Note: There can be a maximum of 4 subsections in each Question.

Text Books:

1. William H Hayt Jr and John A Buck., Engineering electromagnetic, TMH 7th ed.
2. K D Prasad, Antenna and Wave propagation, Satyaprakashan Publishers,2012

Reference Books:

1. John D Kraus, Antennas, Third Edition, McGrawHill
2. Jordan and Balmain, Electromagnetic waves and radiating systems, Second Edition, PHI
3. C A Balanis, Antenna theory analysis and design, Third Edition, Wiley
4. E C Jordon & K G . Balmain., electromagnetic waves and radiation system., PHI2nd ed
5. Kraus J D and Carver K R., electromagnetic., (TMH)
6. P V Gupta., An Introduction Course in electromagnetic.
7. P. N. O Sadiku, "Elements of electromagnetic" 4th ed. Oxford University press.

E books and online course materials:

Course outcomes:
On completion of the course, the student will have the ability to:

Course Code	CO #	Course Outcome (CO)
21EC53	CO1	Analyze the Electric fields due to different sources of electric fields
	CO2	Analyze Steady and time varying magnetic fields
	CO3	Determine the characteristic parameters of antennas
	CO4	Analyze antenna arrays.
	CO5	Illustrate the construction and working of different types of antennas.

21EC53: Field Theory and Antennas

CO#	Course Outcome (CO)	PO												PSO		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	Analyze the Electric fields due to different sources of electric fields	3	3	2					1		1		1	3	2	2
CO2	Analyze Steady and time varying magnetic fields	3	3	2					1		1		1	3	2	2
CO3	Determine the characteristic parameters of antennas	3	2						1		1		1	3	2	2
CO4	Analyze antenna arrays.	3	3	2	2				1		1		1	3	2	2
CO5	Illustrate the construction and working of different types of antennas.	3	2	2	2				1		1			3	2	3
	AVERAGE	3	2.6	2	2				1		1		1	3	2	2.2

ANALOG AND DIGITAL COMMUNICATION			
Course Code	21EC54	Credits	3
Course Type	Theory	CIE Marks	50
Lecture Hours(L:T:P)	3:0:0	SEE Marks	50
Total Hours	42	SEE Hours	3

Course Objectives: The objectives of the course is to enable students:

1. To introduce the concepts of analogue communication systems.
2. To equip students with various issues related to analogue communication such as modulation, demodulation.
3. To understand different PCM techniques and its analysis in terms of SNR.
4. To understand different carrier modulation techniques and its BER performance.
5. To study and understand properties of orthogonal codes and its use in spread spectrum communication

Modules	Teaching Hours
Module-1	
Amplitude Modulation: Amplitude modulation, double sideband, double sideband suppressed carrier modulation, SSB modulation, vestigial sideband modulation, costas receiver, quardrature-amplitude modulation.	**8**
Module-2	
Angle Modulation: Basic definitions, properties of angle-modulated waves, relationship between PM and FM waves, narrow-band frequency modulation, wide-band Frequency Modulation, transmission bandwidth of FM waves, generation of FM waves, demodulation of FM signals **Radio Receivers**: Tuned radio frequency receiver, super heterodyne receiver- RF section, frequency mixers, tracking, intermediate frequency, AGC.	**9**
Module-3	
Pulse Modulation systems: Pulse amplitude modulation (PAM), Pulse width modulation (PWM) and Pulse position modulation (PPM). Bandwidth requirements, generation and reconstruction methods, Analog to digital conversion, quantization and encoding techniques, quantization noise in PCM, Companding in PCM systems, Time division multiplexing (TDM), The delta modulator and its operation, quantization noise and slope overload in delta modulators. Comparison of delta modulation and PCM.	**9**
Module-4	
Digital Modulation: PSK, DPSK and FSK. M-array data communication systems, QAM systems, four phase PSK effects of noise in modulated digital communication Systems, Probability of error expression for binary communications, probability of error in QAM systems, comparison of digital modulation systems.	**8**
Module-5	
Spread Spectrum Systems: PN sequence, PN sequence generation, Properties of PN sequence, Direct sequence Spread spectrum, Slow and fast Frequency hopping, Time hopping, Signal space dimensionality and processing gain, antijam characteristics, CDMA Applications, comparison of spread spectrum communication.	**8**

Question paper pattern:

- The question paper shall have five Module for 100 marks;
- Each full question carries 20 marks.

- Two questions to be set in each module (total ten questions).
- The candidate will have to answer one full question from each module.

Note: There can be a maximum of 4 subsections in each Question.

Text Books:

1. Simon Haykin, 'Introduction to Analog and Digital Communications', Second Edition.
2. Herbert Taub, Donald L.Schiling, 'Principles of Communication Systems', Second Edition.

Reference Books:

1. Simon Haykin, Digital Communications, John Wiley and Sons.
2. H.P.Hsu , Analog and Digital Communications, Schuam's outline series.
3. J G Proakis, Digital communications, MH.
4. B P Lathi, Modern Digital and Analog Communication, 3rd Edition.

E books and online course materials: NPTEL

Course outcomes:
On completion of the course, the student will have the ability to:

Course Code	CO #	Course Outcome (CO)
21EC54	**CO1**	Analyze different amplitude modulation and demodulation techniques.
	CO2	Analyze different angle modulation and demodulation techniques.
	CO3	Analyze different PCM techniques and its analysis in terms of SNR
	CO4	Analyze different carrier modulation techniques and its BER performance
	CO5	Analyze properties of orthogonal codes and its use in spread spectrum communication.

21EC54: Analog and Digital Communication

CO#	Course Outcome (CO)	PO												PSO		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	Analyze different amplitude modulation and demodulation techniques.	3	2	2	2				1		1		1	3	2	2
CO2	Analyze different angle modulation and demodulation techniques.	3	3	2	2				1		1		1	3	2	2
CO3	Analyze different PCM techniques and its analysis in terms of SNR	3	3	2	2				1		1		1	3	2	2
CO4	Analyze different carrier modulation techniques and its BER performance	3	3	2	2				1		1		1	3	2	2
CO5	Analyze properties of orthogonal codes and its use in spread spectrum communication.	3	2	2	2				1		1		1	3	2	2
Average		3	2.6	2	2				1		1		1	3	2	2

ANALOG & DIGITAL COMMUNICATION LAB			
Course Code	21ECL55	Credits	1
Course Type	Practical	CIE Marks	50
Lecture Hours(L:T:P)	0:0:2	SEE Marks	50
Total Hours	28	SEE Hours	3

Course Objectives: The objectives of the course is to enable students:

- To design and demonstrate second order active low pass, high pass, band pass filters
- To design and demonstrate analog and angle modulation.
- To design and demonstrate pulse modulation and demodulation.
- To design and demonstrate digital modulation and demodulation such ASK, PSK, DPSK and FSK.
- To verify and demonstrate PN sequence generation.

List of Experiments

1. Second order active low pass and high pass filter
2. Second order active band pass and band elimination filter
3. Amplitude modulation and demodulation using envelop detector
4. Frequency modulation and demodulation using PLL
5. Pre-emphasis and De-emphasis circuits.
6. PAM modulation and demodulation
7. PPM Modulation and demodulation
8. PWM Modulation and demodulation
9. Signal sampling and its reconstruction
10. Time division multiplexing of signals
11. Amplitude shift keying
12. Frequency shift keying
13. Phase shift keying
14. Differential phase shift keying
15. PN sequence generator

Conduct of Practical Examination:

- All laboratory experiments are to be included for practical examination
- Students are allowed to pick one experiment from the lot.
- Strictly follow the instructions as printed on the cover page of answer Script for breakup of marks.
- Change of experiment is allowed only once and will be evaluated for 85% of the total Marks.

Course outcomes:
On completion of the course, the student will have the ability to:

Course Code	CO #	Course Outcome (CO)
21ECL55	CO1	Design various second order active filters.
	CO2	Design AM, FM and its demodulation.
	CO3	Design pre-emphasis and de-emphasis.
	CO4	Design and implement ASK, FSK and PSK modulation and demodulation.
	CO5	Design and implement PN sequence generator.

21ECL55: Analog and Digital Communication Lab

CO#	Course Outcome (CO)	PO												PSO		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	Design various second order active filters.	3	2	2	2	2	1	1	2	3	2		1	3	3	2
CO2	Design AM, FM and its demodulation.	3	2	2	2	2	1	1	2	3	2		1	3	3	2
CO3	Design pre-emphasis and de-emphasis.	3	2	2	2	2	1	1	2	3	2		1	3	3	2
CO4	Design and implement ASK, FSK and PSK modulation and demodulation.	3	2	2	2	2	1	1	2	3	2		1	3	3	2
CO5	Design and implement PN sequence generator.	3	2	2	2	2	1	1	2	3	2		1	3	3	2
Average		3	2	2	2	2	1	1	2	3	2		1	3	3	2

RESEARCH METHODOLOGY & INTELLECTUAL PROPERTY RIGHTS			
Course Code	21RMI56	Credits	2
Course Type	Theory	CIE Marks	50
Lecture Hours(L:T:P)	1:2:0	SEE Marks	50
Total Hours	28	SEE Hours	3

Course Objectives: The objectives of the course is to enable students:

- To Understand the knowledge on basics of research and its types.
- To Learn the concept of defining research problem and Literature Review, Technical Reading.
- To learn the concept of attributions and citation and research design.
- Concepts, classification, need for protection, International regime of IPRs - WIPO, TRIPS, Patent - Meaning, Types, surrender, revocation, restoration, Infringement, Procedure for obtaining Patent and Patent Agents.
- Meaning, essential requirements, procedure for registration and Infringement of Industrial Designs, Copyright.

Modules	Teaching Hours
Module-1	
Introduction: Meaning of Research, Objectives of Engineering Research, and Motivation in Engineering Research, Types of Engineering Research, Finding and Solving a Worthwhile Problem. Ethics in Engineering Research, Ethics in Engineering Research Practice, Types of Research Misconduct, Ethical Issues Related to Authorship	**6**
Module-2	
Defining the research problem - Selecting the problem. Necessity of defining the problem Techniques involved in defining the problem- Importance of literature review in defining a problem Literature Review and Technical Reading, New and Existing Knowledge, Analysis and Synthesis of Prior Art Bibliographic Databases, Web of Science, Google and Google Scholar, Effective Search: The Way Forward Introduction to Technical Reading Conceptualizing Research, Critical and Creative Reading, Taking Notes While Reading, Reading Mathematics and Algorithms, Reading a Datasheet.	**6**
Module-3	
Research design and methods - Research design - Basic principles. Need of research design Features of good design- Important concepts relating to research design - Observation and Facts Attributions and Citations: Giving Credit Wherever Due, Citations: Functions and Attributes, Impact of Title and Keywords on Citations, Knowledge Flow through Citation, Citing Datasets, Styles for Citations, Acknowledgments and Attributions, What Should Be Acknowledged, Acknowledgments in, Books Dissertations, Dedication or Acknowledgments.	**6**
Module-4	
Basic Concepts of Intellectual Property (IP), Classification of IP, Need for Protection of IP, International regime of IPRs - WIPO , TRIPS. Patents: Meaning of a Patent – Characteristics/ Features. Patentable and Non-Patentable Invention. Procedure for obtaining Patent. Surrender of Patent, revocation &restoration of Patents, Infringement of Patents and related remedies (penalties) . Different prescribed forms used in Patent Act. Patent agentsqualifications and disqualifications Case studies on patents - Case study of Neem petent, Curcuma(Turmeric)patent and Basmati rice patent, Apple inc.v Samsung electronics co.Ltd	**5**

Module-5	
Industrial Design: Introduction to Industrial Designs. Essential requirements of Registration. Designs which are not registrable, who is entitled to seek Registration, Procedure for Registration of Designs Copy Right Meaning of Copy Right. Characteristics of Copyright. Who is Author, various rights of owner of Copyright. Procedure for registration. Term of copyright, Infringement of Copyright and Its remedies. Software Copyright.	**5**

Question paper pattern:

- The question paper shall have five Module for 100 marks;
- Each full question carries 20 marks.
- Two questions to be set in each module (total ten questions).
- The candidate will have to answer one full question from each module.

Note: There can be a maximum of 4 subsections in each Question.

Text Books:

1. Research Methodology: Methods and Techniques C.R.Kothari, Gaurav Garg New Age International 4th Edition,2018
2. Dipankar Deb•RajeebDey,ValentinaE.Balas "EngineeringResearchMethodology",ISSN1868- 4394 ISSN 1868-4408 (electronic), Intelligent Systems Reference Library, ISBN 978-981-13- 2946-3 ISBN 978-981-13-2947-0 (eBook), https://doi.org/10.1007/978-981-13-2947-0.3
3. Dr. M.K. Bhandari"Law relating to Intellectual property" January 2017 (Publisher By Central Law Publications). Dr. R Radha Krishna and Dr. S Balasubramanain "Text book of Intellectual Property Right". First edition, New Delhi 2008. Excel books.
4. P Narayan "Text book of Intellectual Property Right". 2017 ,Publisher: Eastern Law House

Reference Books:

1. David V.Thiel"ResearchMethodsforEngineers"CambridgeUniversityPress,978-1-107-03488- 4-
2. Nishith Desai Associates - Intellectual property law in India – Legal, Regulatory & Tax

E books and online course materials:

- NPTEL: INTELLECTUAL PROPERTY by PROF.FEROZ ALI , Department of Humanities and Social Sciences IIT Madras https://nptel.ac.in/content/syllabus_pdf/109106137.pdf
- www.wipo.int
- www.ipindia.nic.in

Course outcomes:
On completion of the course, the student will have the ability to:

Course Code	CO #	Course Outcome (CO)
21RMI56	**CO1**	To know them leaning of engineering research.
	CO2	To know the defining of research problem and procedure of Literature Review.
	CO3	To know the Attributions and Citations and research design.
	CO4	Highlights the basic Concepts and types of IPRs and Patents
	CO5	Analyse and verify the procedure for Registration of Industrial Designs & Copyrights

INTRODUCTION TO WEB PROGRAMMING			
Course Code	21ECAE582	Credits	1
Course Type	Practical	CIE Marks	50
Lecture Hours(L:T:P)	0:0:2	SEE Marks	50
Total Hours	28	SEE Hours	2

Course Objectives: The objectives of the course is to enable students to:

- To use the syntax and semantics of HTML and XHTML.
- To develop different parts of a web page.
- To understand how CSS can enhance the design of a webpage.
- To create and apply CSS styling to a webpage.
- To get familiarity with the JavaScript language and understand Document Object Model handling of Java Script.

Modules	Teaching Hours
Module-1	
Traditional HTML and XHTML: First Look at HTML and XHTML, Hello HTML and XHTML World, HTML and XHTML: Version History, HTML and XHTML DTDs: The Specifications Up Close, (X)HTML Document Structure, Browsers and (X)HTML, The Rules of (X)HTML, Major Themes of (X)HTML, The Future of Markup—Two Paths?	5
Module-2	
HTML5: Hello HTML5, Loose Syntax Returns, XHTML5, HTML5: Embracing the Reality of Web Markup, Presentational Markup Removed and Redefined, HTML5 Document Structure Changes, Adding Semantics, HTML5's Open Media Effort, Client-Side Graphics with <canvas>, HTML5 Form Changes, Emerging Elements and Attributes to Support Web Applications	5
Module-3	
Cascading Style Sheets (CSS): Introduction, CSS Overview , CSS Rules, Example with Type Selectors and the Universal Selector, CSS Syntax and Style, Class Selectors, ID Selectors, span and div Elements, Cascading, style Attribute, style Container, External CSS Files, CSS Properties, Color Properties, RGB Values for Color, Opacity Values for Color, HSL and HSLA Values for Color, Font Properties, line-height Property, Text Properties, Border Properties, Element Box, padding Property, margin Property , Case Study: Description of a Small City's Core Area.	6
Module-4	
Tables and CSS, Links and Images: Table Elements, Formatting a Data Table: Borders, Alignment, and Padding, CSS Structural Pseudo- Class Selectors, thread and tbody Elements, Cell Spanning, Web Accessibility, CSS display Property with Table Values, a Element, Relative URLs, Navigation Within a Web Page, CSS for Links, Bitmap Image Formats: GIF, JPEG, PNG, img Element, Responsive Images, Positioning Images, Shortcut Icon, iframe Element.	6
Module-5	
Introduction to JavaScript: Functions, DOM, Forms, and Event Handlers: History of JavaScript, Hello World Web Page, Buttons, Functions, Variables, Identifiers, Assignment Statements and Objects, Document Object Model, Forms and How They're Processed: Client-Side Versus Server-Side, form Element, Controls, Text Control, Accessing a Form's Control Values, reset and focus Methods	6

Question paper pattern:

- The question paper shall have five Module for 100 marks;
- Each full question carries 20 marks.
- Two questions to be set in each module (total ten questions).
- The candidate will have to answer one full question from each module.

Note: There can be a maximum of 4 subsections in each Question.

Text Books:

1. HTML & CSS: The Complete Reference Thomas A. Powell, , Fifth Edition, Tata McGraw Hill.
2. Web Programming with HTML5, CSS and JavaScript, John Dean, Jones & Bartlett Learning, First Edition

Reference Books:

1. M Deitel, P.J. Deitel, A.B Goldberg, "Internet & World Wide Web How to H Program"-3rd Edition, Pearson Education/PHI, 2004.
2. Chris Bates, "Web Programming Building Internet Applications"- 3rd Edition, Wiley India, 2006.

E books and online course materials:

https://onlinecourses.swayam2.ac.in/aic20_sp11/preview

Course outcomes:
On completion of the course, the student will have the ability to:

Course Code	CO #	Course Outcome (CO)
21ECAE582	CO1	Explain the historical context and justification for HTML over XHTML
	CO2	Develop HTML5 documents and adding various semantic markup tags
	CO3	Analyse various attributes, values and types of CSS
	CO4	Develop the ability to create own website for given assignment and also perform dynamic designing using CSS.
	CO5	Implement core constructs and event handling mechanisms of JavaScript.

21ECAE582: Introduction to Web Programming

CO#	Course Outcome (CO)	PO												PSO		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	Explain the historical context and justification for HTML over XHTML	2	2	2	2				2		2		2			3
CO2	Develop HTML5 documents and adding various semantic markup tags	2	2	2	3				2		2		2			3
CO3	Analyse various attributes, values and types of CSS	2	2	3	3				2		2		2			3
CO4	Develop the ability to create own website for given assignment and also perform dynamic designing using CSS	2	2	3	3				2		2		2			3
CO5	Implement core constructs and event handling mechanisms of JavaScript.	2	2	2	3				2		2		2			3
Average		2	2	2.4	2.8				2		2		2			3

ENVIRONMENTAL STUDIES

[As per Choice Based Credit System (CBCS) Scheme]
(From the academic year 2022-23)

Course Code	21CIV57	CIE Marks	50
Credits	01	SEE Marks	50
Course Type	Theory		
Lecture Hours/Week (L-T-P)	0-2-0-0	Total Marks	100
Total Hours	28 Hours	SEE Hours	01

Course Objectives:

- To create environmental awareness among the students.
- To gain knowledge on different types of pollution in the environment.

Teaching-Learning Process(General Instructions)

These are sample Strategies; which teacher can use to accelerate the attainment of the various course outcomes.

1. Apart from conventional lecture methods various types of innovative teaching techniques through videos and animation films may be adopted so that the delivered lesson can progress the students in theoretical, applied and practical skills.
2. Environmental awareness program on off campus
3. Encourage collaborative (Group Learning) Learning in the class.Seminars, surprise tests and Quizzes may be arranged for students in respective subjects to develop skills.

Modules	Hours
Module - I Ecosystems (StructureandFunction): Forest, Desert, Wetlands, River, OceanicandLake. Biodiversity:Types,Value;Hot spots; Threatsand Conservation of biodiversity, Forest Wealth, And Deforestation.	05 Hours
Module - II Advances in Energy Systems (Merits, Demerits, Global Status and Applications): Hydrogen, Solar, OTEC, Tidal and Wind. Natural Resource Management (Concept and case-studies): Disaster Management, Sustainable Mining, case studying, and Carbon Trading	05 Hours
Module-III **Environmental Pollution** (Sources, Impacts, Corrective and Preventive measures, Relevant Environmental Acts, Case-studies): Surface and Ground Water Pollution; Noise pollution; Soil Pollution and Air Pollution. **Waste Management & Public Health Aspects** :Bio-medical Wastes; Solid waste; Hazardous, Wastes; E-wastes; Industrial and Municipal Sludge.	06 Hours

Module-IV **Global Environmental Concerns**(Concept, policies and case-studies): Groundwater depletion/recharging, Climate Change; Acid Rain; Ozone Depletion; Radon and Fluoride problem In drinking water; Resettlement and rehabilitation of people, Environmental Toxicology.	06 Hours
Module - V **Latest Developments in Environmental Pollution Mitigation Tools (Concept and Applications):** G.I.S. & Remote Sensing, Environment Impact Assessment, Environmental Management Systems, ISO14001; Environmental Stewardship- NGOs. Field work: Visit to an Environmental Engineering Laboratory or Green Building or Water Treatment Plant or Waste water treatment Plant; ought to be Followed by understanding of process and its brief Documentation in the form of report.	06 Hours

Course outcome(Course Skill Set)

At the end of the course the student will be able to:

CO1: Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,

CO2: Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.

CO3: Demonstrate ecology knowledge of a complex relationship between biotic and a biotic components.

CO4: Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.

CO5: Understand Latest Developments in Environmental Pollution Mitigation Tools Concept and Applications of G.I.S. & Remote Sensing.

Assessment Details (both CIE and SEE)

The weight age of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50)in the semester-end examination(SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE(ContinuousInternalEvaluation)andSEE(SemesterEndExamination) taken together.

Continuous Internal Evaluation:

Three Unit Tests each of **20Marks (duration 01 hour**)

1. First test at the end of5th week of the semester
2. Second test a the end of the10th week of the semester
3. Third test at the end of

the15thweek of the semester Two

assignments each of **10 Marks**

4. First assignment at the endof4thweek of the semester
5. Second assignment at the end of 9thweek of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the Cos and Pos for **20 Marks** (**duration01hours**)

6. At the end of the13thweek of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be

Scaled down to 50 marks

(to have less tresses CIE, the portion of the syllabus should not be common/repeated for any of the method of the CIE. Each method of CIE should have a different syllabus portion of the course).

CIE methods/question paper is designed to attain the different levels of Bloom' s taxonomy as per the outcome defined for the course.

Semester End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 01 hours)**

Question paper pattern:

1. The Question paper will have 50 objective questions.
2. Each question will before 01marks
3. Students will have to answer all the questions on an OMR Sheet.
4. The Duration of the Exam will be 01 hour

Suggested Learning Resources:

Books

1. Environmental studies, Benny Joseph, Tata Mcgraw -Hill 2ndedition 2012·
2. Environmental studies, SM Prakash , pristine publishing house, Mangalore3rdedition-2018.

Reference Books:-·

1. BennyJoseph, Environmental studies,TataMcgraw-Hill2ndedition 2009·
2. M. Ayi Reddy TextbookofenvironmentalscienceandTechnology,BSpublications2007·
3. Dr.B.SChauhan,Environmentalstudies,universityofsciencepress1stedition