SHIVAJI UNIVERSITY, KOLHAPUR

SYLLABUS AND STRUCTURE

FINAL YEAR (B. Tech.)

Electronics & Computer Science

To be introduced from the academic year 2025-26

(i.e., from June 2025) onwards

Semester VII

Sr. No	Code No.	Subject	Semester	Credits
1	PCC-ECS-701	VLSI Design	7	4
2	PCC-ECS-702	Machine Learning using Python	7	4
3	PCC-ECS-703	Digital Image Processing	7	4
4	PCC-ECS-704	Video Engineering	7	3
5	PEC-ECS-701	Elective III	7	3
6	EL-ECS-701	Internship	7	2
7	EL-ECS-702	Project phase-I	7	2
		Total		22

Semester VIII

Sr. No	Code No.	Subject	Semester	Credits
1	PCC-ECS-801	ARM & Embedded system	8	5
2	PCC-ECS-802	Cyber Security	8	4
3	PCC-ECS-803	Web Technology	8	4
4	PEC-ECS-801	Elective IV	8	3
5	HM-ECS-801	Seminar	8	2
6	EL-ECS-801	Project phase-II	8	4
		Total		22

*****For Theory CIE 30 Marks,**

Two tests of 30 marks at college should be conducted and best of two marks should be communicated to university.

*****Guidelines to paper setter:**

In theory ESE examination of 70 marks following pointes should be considered,

1. First question of 10 marks should be allotted to Objective type questions.
2. In Remaining 60 marks, four questions of 15 marks should be considered.

FINAL YEAR ELECTRONICS & COMPUTER SCIENCE – CBCS PATTERN

Semester Examination

SEMESTER VII																								
Sr. No	Course (Subject Title)	TEACHING SCHEME									EXAMINATION SCHEME													
		THEORY			TUTORIAL			PRACTICAL			THEORY					PRACTICAL			TERM WORK				
		Credits	No. of Lecture	Hours	Credits	No. of Lecture	Hours	Credits	No. of Lecture	Hours	Hours	Mode	Marks	Total Marks	Min	Hours	Max	Min	Hours	Max	Min			
1	PCC-ECS-701	3	3	3	-	-	-	1	2	2		CIE	30	100	40	As per BOS Guidelines	-	-		25	10			
												ESE	70											
2	PCC-ECS-702	3	3	3	-	-	-	1	2	2		CIE	30	100	40		50	20		25	10			
												ESE	70											
3	PCC-ECS-703	3	3	3	-	-	-	1	2	2		CIE	30	100	40		50	20		25	10			
												ESE	70											
4	PCC-ECS-704	3	3	3	-	-	-	-	-	-		CIE	30	100	40		-	-		25	10			
												ESE	70											
5	PEC-ECS-701	3	3	3	-	-	-	-	-	-		CIE	30	100	40		-	-		-	-			
												ESE	70											
6	EL-ECS-701				-	-	-	2	4	4		IOE	-	-	-		-	-		25	10			
7	EL-ECS-702				-	-	-	2	4	4		IPE	-	-	-		50	20		25	10			
	TOTAL	**15**	**15**	**15**	**-**	**-**	**-**	**7**	**14**	**14**				**500**			**150**			**150**	60			
SEMESTER VIII																								
1	PCC-ECS-801	4	4	4	-	-	-	1	2	2		CIE	30	100	40	As per BOS Guidelines	50	20		25	10			
												ESE	70											
2	PCC-ECS-802	3	3	3	-	-	-	1	2	2		CIE	30	100	40					25	10			
												ESE	70											
3	PCC-ECS-803	3	3	3	-	-	-	1	2	2		CIE	30	100	40		50	20		25	10			
												ESE	70											
4	PEC-ECS-801	3	3	3	-	-	-	-	-	-		CIE	30	100	40		-	-		25	10			
												ESE	70											
5	HM-ECS-801	2	2	2	-	-	-	-	-	-		CIE	30				-	-		50	20			
												ESE	70											
6	EL-ECS-801	-	-	-	-	-	-	4	4	4							100	40		50	20			
	TOTAL	**15**	**15**	**15**	**-**	**-**	**-**	**7**	**10**	**10**				**400**			**200**			**200**	80			
	TOTAL	**28**	**28**	**28**	**-**	**-**	**-**	**16**	**28**	**28**				**1000**			**275**			**325**				

CIE- Continuous Internal Evaluation. ESE – End Semester Examination

• Candidate contact hours per week: 30 Hours (Minimum)	• Total Marks for Final Year B. Tech. Sem VII & VIII: 1600
• Theory and Practical Lectures: 60 Minutes	• Total Credits for Final Year B. Tech VII & VIII: 44
• In theory examination there will be a passing based on separate head of passing for examination of CIE and ESE.	
• There shall be separate passing for theory and practical (term work) courses.	

Note:

1. **PCC-ECS:** Professional Core course –Electronics & Computer Science Engineering are compulsory.
2. **PEC-ECS:** Program Elective course
3. **EL- ECS:** Experiential Learning.

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE

VLSI Design

Course Details

Class:	F. Y. B. Tech Sem - VII
Course Code and Course Title	PCC-ECS-701- VLSI Design
Prerequisites	Fundamental of Electronics
Teaching scheme: Lecture /Practical/Tutorial	3/1/0
Credits	3+1
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 03Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Practical's: 02 Hrs./Week	TW: 25 Marks

Course Outcomes: Upon successful completion of this course, the students will be able to:	
1	Apply Boolean laws/K-Map-method, to reduce a given Boolean function
2	Design & realize combinational logic circuits using logic gates.
3	Demonstrate the operation of flip-flops, counters, shift registers Synchronous sequential machine using Moore and Mealy machine
4	Design combinational and sequential logic circuits using various description techniques in VHDL

Course Outcomes: Upon successful completion of this course, the students will be able to:	
1	Apply Boolean laws/K-Map-method, to reduce a given Boolean function
2	Design & realize combinational logic circuits using logic gates.
3	Demonstrate the operation of flip-flops, counters, shift registers Synchronous sequential machine using Moore and Mealy machine
4	Design combinational and sequential logic circuits using various description techniques in VHDL

Section - I

UNIT NO	CONTENTS	HOURS
1	Basics of digital systems: Generation of Switching Equations from Truth Table, Canonical forms, K-map (Karnaugh map) 2,3,4 and 5 variables, K map with Don't care terms - Quine Mc-Cluskey minimization technique, Quine Mc-Cluskey using Don't Care Terms, Binary codes, Code Conversion.	7
2	Introduction to VHDL: Level of abstraction. Need of HDL, VLSI Design flow, Features and capabilities of VHDL, Elements of VHDL (Entity Architecture, Library, Package, and Configuration), Modeling styles in VHDL, Identifiers, operators, Data objects, data types, literals, Delay Models, Concurrent and sequential statement.	7
3	Combinational logic Design: Adder, Subtractor, Code converters (binary to gray & gray to binary, BCD to Excess 3 and vice versa, BCD to 7 segment display), Multiplexer and Demultiplexer, Encoder, Priority encoder, Decoder, Comparator, ALU, Barrel shifter. VHDL coding for combinational circuits.	7
Section-II		
4	Sequential logic Design: 1-Bit Memory Cell, Latches (SR, JK, D and T), Clocked latches (SR, JK, D and T), flips flop (SR, JK, T and D). Use of preset and clear, Excitation Table for flip flops, and Conversion of flip flops, Timing parameters of FF, Shift registers (SISO, SIPO, PIPO, and PISO). VHDL coding for Sequential circuits.	7
5	Counters and Finite State Machines: Counter – ripple counters, synchronous counters, Up/down counters, Ring counters, Johnson Counter, MOD-N counter, FSM, Moore/Mealy machines, state diagram, state table, state assignment and state reduction, Sequence detector. VHDL coding for Counters and FSM.	7
6	Semiconductor Memories and Programmable Logic Devices Memory devices: ROM, PROM, EPROM, EEPROM, RAM, SRAM, DRAM, NVRAM, Programmable logic devices: PAL, PLA, CPLD and FPGA. Logic implementation using Programmable Devices (ROM, PLA)	7
Total		42

Text Books:

01 A. Anand Kumar, "Fundamentals of digital circuits", 4 th edition, PHI Publication, 2016

02 Stephen Brown and Zvonko Vranesic, "Fundamentals of Digital Logic with VHDL design", Tata Mc-graw Hill Publication

Reference Books:

01 Wakerly, "Digital Design Principles and Application", Pearson Education

02 M. Morris Mano, " Digital Design", 3 rd Edition , Pearson Education

03 Roth John, “Principals of Digital System Design using VHDL”, Cengage Learning.

04 R. P. Jain, “Modern digital electronics”, 3rd edition, 12th reprint Tata Mc-graw Hill Publication, 2007

List of Experiments (Minimum 08 experiments):

1 Implementation of Boolean function using IC.

2 Design and simulate half adder and full adder using VHDL.

3 Design and simulate Multiplexer and De-multiplexer using VHDL.

4 Design and simulate Comparator adder using VHDL.

5 Design and simulate 3to8 decoder using VHDL.

6 Design and simulate flip-flops using VHDL.

7 Design and simulate 4-bit up-down counter using VHDL.

8 Design and simulate Shift register using VHDL.

9 Design and simulate Sequence detector using VHDL.

10 Mini projects based on above syllabus.

General Instructions:

1)For the term work of 25 marks, batch wise tutorials are to be conducted. The number of students per batch per tutorial should be as per university rules.

2)Number of assignments should be at least six (All units should be covered).

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE

Machine Learning using Python

Course Details

Class	Final Year. B. Tech Sem - VII
Course Code and Course Title	PCC-ECS-702 - Machine Learning using Python
Prerequisites	Basic Python, Linear Algebra, Probability, and Statistics
Teaching scheme: Lecture /Practical/Tutorial	3/1/0
Credits	3+1
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 03Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: NA	TW: 25 Marks
Practical: 02Hrs. / Week	ESE: 50 Marks

Course Objectives:

1. To understand Machine Learning Aspects
2. To understand primitives in learning process by Computer
3. To understand nature of problems solved with Machine Learning

Course Outcomes:

After completion of this course students will be able to:

1. Explain Machine Learning concepts
2. Analyze the Machine Learning model
3. Design solution using Classification and Decision trees algorithm
4. Explain supervised machine learning algorithm for classification problems
5. Describe unsupervised learning techniques
6. Explain neural network useful for machine learning

UNIT NO.	UNIT NAME & DETAILS	NO. OF LECTURES
1.	Introduction to Machine Learning: Machine Learning: Definition, Terminology, Types of learning, Machine Learning Problem categories, Machine learning architecture, process, Lifecycle, Performance measures, tools and framework, data visualization, Regularization: Over fitting & Under fitting, cost function, Regularized Linear Regression, Regularized Logistic Regression,	6
2.	Regression: Simple regression: Hypothesis, cost function, parameter learning with gradient descent, learning rate, Gradient Descent for linear regression. Multivariate Linear Regression: Multiple features, hypothesis functions, Gradient Descent for multiple variables, Feature scaling, polynomial regression,	6
3.	Classification- logistic regression and Decision trees Logistic Regression – Definition, Hypothesis representation, decision boundary, cost function, Gradient Descent for Logistic Regression. Multiclass Classification, Decision trees: definition, terminology, the need, advantages, and limitations. Constructing and understanding Decision trees, common problems with Decision trees, Decision tree algorithms, random forest, examples,	7
4.	Classification: Naïve Bayes and Support Vector Machine Naïve Bayes Classifier. Instance-based classifier – K- Nearest Neighbor Classifier, Bayesian Network, Hidden Markov Model. Support Vector Machine: What is SVM, Kernel Trick, Cost Function, and Decision Trees vs. Support Vector Machine,	7
5.	Unsupervised learning: Clustering, K Means clustering, Hierarchical clustering, Association Rule mining,	**4**
6.	Neural Networks: Neuron representation and model, Hypothesis for neuron, cost function, solution of a problem using single neuron. Gradient descent for a neuron. Neural network, Multiclass classification with neural network. Learning in neural network-back propagation algorithm,	**6**

List of Experiments:

1. Study and installation of python
2. Study and implementation of Simple Linear Regression
3. Write a program to implement Multiple Linear Regression
4. Write a program to implement Logistic Regression
5. Write a program to implement Multi-class Classification
6. Write a program to implement Neural Network
7. Write a program to implement Back propagation algorithm of Neural Network
8. Write a program to implement K-means Clustering
9. Write a program to implement association rule mining
10. Write a simple program to identify next point of time series analysis
11. Write a program to build naïve bay's classifier for text data
12. Demonstrate simple recommendation system

Text Books

Sr. No.	Title	Author(s) Name	Publication & Edition	Units Covered
1	Machine Learning with Python- an approach to applied ML	Abhishek Vijayvargia	BPB Publications	All units
2	Practical Machine learning	Sunila Gollapudi	Packt Publishing Ltd	1,2
3	Machine Learning	Tom M. Mitchell	McGraw Hill Education; First Edition	1,2,3,4,5

Reference Books

Sr. No.	Title	Author(s) Name	Publication & Edition
1	Machine Learning for dummies	John Paul Muller	Willey Publication
2	Introduction to Machine Learning	Ethem Alpaydin	PHI 2nd Edition-2013

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE

Digital Image Processing

Course Details

Class	Final Year B. Tech Sem - VII
Course Code and Course Title	PCC-ECS- 703
Prerequisites:	Digital Signal processing
Teaching scheme: Lecture /Practical/Tutorial	3/1/0
Credits	3+1
Evaluation scheme CIE/ESE for Theory	30/70

TEACHING SCHEME	EXAMINATION SCHEME
Theory :3 Hrs./Week	Theory: ESE 70 Marks CIE 30 Marks
Tutorial: 1 Hrs./Week	Term work: 25 Marks
Practical: 2 Hrs. / Week	ESE: – 50 Marks

Course Objectives

1. To learn the fundamental concepts of Digital Image Processing
2. To study basic image processing operations.
3. To cover the basic analytical methods which are widely used in image processing.

Course Outcomes

Upon successful completion of this course, the students will be able to:

1. Describe the basic issues and the scope of image processing, and the roles of image processing and systems in a variety of applications.
2. Explore different techniques in image acquisition and color transformation
3. Understand how digital images are represented
4. Evaluate the mathematical principles of digital image enhancement
5. Explore and apply the concepts of Edge detection, segmentation and object recognition

UNIT NO.	UNIT NAME & DETAILS	NO. OF LECTURES
1.	**Introduction** Concept of Digital Image Processing, Steps in Image Processing, Components of Image Processing System, Applications areas, Image representation, grey scale and color images.	6
2.	**Image Enhancement and Processing:** Basic Grey level transformation, Histogram Processing techniques, Color Fundaments, color models, Pseudo color image processing.	7
3.	**Image Restoring and Reconstruction:** Noise models, Noise Reduction, Inverse filtering, MMSE filtering.	5
4.	**Image Compression:** Fundamental of Redundancies, Basic Compression Methods, Huffman coding, Arithmetic coding, LZW coding, JPEG compression, Standard**.**	5
5.	**Image Segmentation:** Detection of Discontinuities, Point, Line and Edge detection, Thresholding, Region based Segmentation.	**6**
6.	**Image Processing Applications:** Biometric Pattern Recognition, Face Recognition. Preprocessing of Signature Patterns, Lung Disease Identification.	**7**

Term Work

- It should consist of minimum 8 – 10 assignments based on the above topics.

Text Books

Sr. No.	Title	Author(s) Name	Publication & Edition	Units Covered
1	Digital Image Processing	R.C.Gonzalez and R.E.Woods	Pearson Edition	1 to 6

Reference Books

Sr. No.	Title	Author(s) Name	Publication & Edition
1	Digital Image Processing	A.K.Jain	PHL
2	Image processing, Analysis and Machine vision	M.Sonka, V.Hlavac, and R.Boyle	Thomson Asia pvt. Ltd

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE

Video Engineering

Course Details	Video Engineering
Class	Final Year B. Tech Sem - VII
Course Code and Course Title	PCC-ECS-704 Video Engineering
Prerequisites	Electronics all basic circuits.
Teaching scheme: Lecture /Practical/Tutorial	3/0/0
Credits	3
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 03Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: NA	TW: 25 Marks
Practical: NA	ESE: NA

Course Objectives: The course aims to:	
1	Provide basics information of TV system
2	Know color TV transmission and reception
3	Understand basic concept of digital TV system
4	Understand high-definition TV
5	Know advanced TV systems like LCD, plasma, LED, CCTV
6	Provide the knowledge of digital video systems like video conferencing and video phone.

Course Outcomes: Upon successful completion of this course, the students will be able to:	
1	Describe picture and sound transmission and reception
2	Explain color composite video signal
3	Describe principle of digital TV system
4	Explain high-definition television system
5	Elaborate concept of video conferencing and videophone.
6	Describe advanced TV system like LCD, plasma, LED, CCTV, etc..

COURSE CONTENTS		
Unit No.1	**ELEMENTS OF A TELEVISION SYSTEM** Modulation of picture and sound signals, positive and negative modulation, aspect ratio, kell factor, horizontal and vertical resolution, video bandwidth, progressive and interlaced scanning, composite video signal, horizontal & vertical sync details, vestigial sideband correction, channel bandwidth, CCIR-B standards, monochrome TV receiver block diagram	**8 Hrs.**
Unit No.2	**COLOR SIGNAL TRANSMISSION AND RECEPTION** Color mixing theory (additive and subtractive), compatibility considerations, frequency interleaving process, luminance, hue and saturation, color difference signals, color composite video signals, chromaticity diagram, Color TV receiver block diagram.	**7 Hrs.**
Unit No.3	**TV CAMERA TUBE, PICTURE TUBE AND COLOR TELEVISION STANDARDS** NTSC, PAL & SECAM TV standards: Introduction, Coder, decoders, Comparison, Simple PAL and delayed PAL, TV camera tubes- Vidicon, Plumbicon; Color Picture Tubes- PIL, Delta gun, Trinitron; picture tubes, purity & convergence, automatic degaussing.	**7 Hrs.**
Unit No.4	**DIGITAL TV & HDTV** Merits of digital technology, digital TV signals, digitized video parameters, digital transmission and reception, codec functions, ITT Digit 2000 IC system, MAC signals, D2- MAC/Packet signals, advantages of MAC signals, HDTV systems, HDTV standards & compatibility, the MUSE system	**8 Hrs.**
Unit No.5	**ADVANCED DISPLAY & STUDIO SYSTEMS** Stereo sound system, flat panel display TV receivers, 3-D TV picture, digital equipment for TV studios, construction & working of LED TV.	**7 Hrs.**
Unit No.6	**ADVANCED TELEVISION SYSTEM** CATV, CCTV, DTH receiver, IR remote control, Satellite TV: satellite communication system, satellite electronics	**7 Hrs.**

TEXT BOOKS:

1	Monochrome and Color TV – R.R. Gulati, 2nd revised edition, New Age International Publication
2	Modern Television Practice – Principles, Technology and Service – R.R. Gulati, 4th edition, New Age International Publication
3	Television and Video Engineering - A.M. Dhake, 2nd Edition.

REFERENCE BOOKS:

1.	Digital Video Processing-A. Murat Tekalp, Prentice Hall Signal Processing Series, BS publications.
2.	Audio-Video Engineering – R. C. Jaiswal
3.	Consumer Electronics –S P Bali, Pearson

LIST OF EXPERIMENTS: (Minimum 8 experiments)

1	Study of circuit diagram of monochrome and color a TV receiver
2	CVS for different test patterns
3	RF tuner
4	Video IF & detector
5	Sync separators (V & H)
6	Sound section
7	Horizontal section
8	Vertical section
9	DTH
10	LED TV
11	CATV
12	Trouble shooting of color TV
13	Industrial Visit

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE

Cloud Computing (Elective III)

Course Details

Class	Final Year B. Tech Sem - VII
Course Code and Course Title	PEC-ECS-701- Cloud Computing
Prerequisites	Computer Networks, Operating System-I, Information Security.
Teaching scheme: Lecture /Practical/Tutorial	3/0/0
Credits	3
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 03Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: NA	TW: 25 Marks
Practical: NA	ESE: NA

Course Objectives

1. Understanding the systems, protocols and mechanisms to support cloud computing.
2. Understanding the architecture of cloud computing.
3. Discuss Cloud Platforms in Industry.
4. Understanding cloud computing applications.
5. Discuss Cloud Security and various challenges.

Course Outcomes

Upon successful completion of this course, the students will be able to:

1. Understanding and familiar with the basic concepts of cloud computing.
2. Demonstration of different virtualization techniques.
3. Illustrates different cloud applications.
4. Understand resent trends in cloud computing.
5. Comprehend the importance of cloud security.

UNIT NO.	UNIT NAME & DETAILS	NO. OF LECTURES
1.	**Introduction:** Definition, Historical Developments, Computing Platforms and Technologies. Building cloud computing environments, Principles of Parallel and Distributed Computing: Parallel versus Distributed Computing, Elements of Parallel Computing, Elements of Distributed Computing, and Technologies for Distributed Computing.	6
2.	**Virtualization Characteristics,** Virtualization Techniques, Virtualization and Cloud Computing, Pros and Cons of Virtualization, Technology Examples**.**	6
3.	**Cloud Computing Architecture** Cloud Reference Model, Types of Clouds, And Economics of Clouds, Open Challenges, Cloud Platforms in Industry: Amazon Web Services, Google App Engine, And Microsoft Azure.	7
4.	**Cloud Applications** Scientific Applications in – Healthcare, Biology, Geo-Science; Business Applications in– CRM and ERP, Productivity, Social Networking, Media Applications, Multiplayer Online Gaming.	7
5.	**Advanced Topics in Cloud Computing:** Energy Efficiency in Clouds, Market Based Management of Clouds, Federated Clouds / Inter Cloud, Third Party Cloud Services.	5
6.	**Understanding Cloud Security:** Securing the Cloud, The security boundary, Security service boundary, Security mapping, Securing Data, Brokered cloud storage access, Storage location and tenancy, Encryption, Auditing and compliance, Establishing Identity and Presence, Identity protocol standards	7

Text Books

1. Mastering Cloud Computing, Buyya R, Vecchiola C, Selvi S T, McGraw Hill Education (India), 2013.
2. Cloud Computing Bible, Barrie Sosinsky ,Wiley Publishing Inc. 2011(Unit,VI)

Reference Books

1. Buyya R, Broberg J, Goscinski A, "Cloud Computing - Principles and Paradigms", Wiley, 2011.

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE ENGINEERING

JAVA Script (Elective III)

Course Details

Class	Final Year B. Tech Sem - VII
Course Code and Course Title	PEC-ECS-701- Java Script
Prerequisites	C, C++ and Python Programming
Teaching scheme: Lecture /Practical/Tutorial	3/0/0
Credits	3
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 03Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: NA	TW: 25 Marks
Practical: NA	ESE: NA

Course Objectives: The course aims to:	
1	To introduce students to emerging web technologies.
2	To enable students to use and apply JS objects in web applications.
3	To introduced students to create and demonstrate user define functions.
4	To teach students to understand and perform user – browser interactions.
5	To teach principles of object-oriented programming paradigm.
6	To facilitate students to learns events, cookies and exceptions handling.

Course Outcomes: Upon successful completion of this course, the students will be able to:	
1	Identity and apply JS objects in web applications.
2	Articulate and write user define functions.
3	Describe and develop user – browser interactions.
4	Explain the principles of object-oriented programming paradigm.
5	Use and illustrate the events, cookies and handling exceptions.

COURSE CONTENTS		
Unit No.1	**INTRODUCTION TO JAVASCRIPT** Overview of JS, Client-Side JS, Advantages and Limitation of JS, JS development tools, Keywords, Syntax, Comments, Variables, Global variable, Data types (Primitive and Non-primitive), Operators, if, if...else, if...else if...statements, Switch, Break, continue statements, For loop, For-in loop, while loop, do...while loop.	**6 Hrs.**
Unit No.2	**OBJECTS OF JAVASCRIPT** Methods for creating objects, Object properties, JS Objects- Events, Date, Math, Number, Boolean, String and Array.	**6 Hrs.**
Unit No.3	**JAVASCRIPT FUNCTION** Function definition, Syntax, Parameters, Arguments, Invocation function, Function with return value, Function objects. Function Methods, Nested Functions, Function Constructor.	**6 Hrs.**
Unit No.4	**JAVASCRIPT BOM, DOM AND VALIDATION** **Browser objects**- Methods of browser objects, Window, History, Navigator, Screen objects. **Documents objects**-Properties, Methods of document objects, DOM Compatibility. **JS Validation**- JS form validation and JS email validation.	**6 Hrs.**
Unit No.5	**JAVASCRIPT OBJECT ORIENTED PROGRAMMING** JS class, Objects, Objects methods, Prototype, Constructor methods, Static method, Encapsulation, Inheritance, Polymorphism and Abstraction.	**5 Hrs.**
Unit No.6	**JAVASCRIPT EVENT, COOKIES AND EXCEPTION HANDLING** Types of events, operations using events, cookies and its fields, cookies operations, Page redirection, Exception handling, Types of errors, Debugging, Hoisting, JS Strict Mode.	**7 Hrs.**

TEXT BOOKS:

1.	Javascript for Beginners- by Mark Lassoff 's
2.	JavaScript: The Definitive Guide- by David Flanagan, Kindle Edition
3.	Eloquent JavaScript-by MarijnHaverbeke

REFERENCE BOOKS:

1.	The Principles of Object-Oriented JavaScript –by Nicholas C. Zakas.
2.	JavaScript and JQuery: Interactive Front-End Web Development 1st Edition- by Jon Duckett.
3.	HTML, CSS, and JavaScript- by Meloni Julie C.Person Publication.

TUTORIALS: Minimum Eight (8) tutorials to be conducted out of 12, each tutorial Should demonstrate at-least 2-3 different programs to the concern Statement.

Sr. No.	Tutorials
1.	Write a program to use and demonstrate the operators.
2.	Write a program using looping statements (For, While, do-While, For-In).
3.	Write a program to demonstrate the applications of Array.
4.	Write a program to demonstrate the use of Boolean and Math objects.
5.	Write a program using user define functions.
6.	Write a program to create registration form and perform Validation.
7.	Write a program to create class with Objects.
8.	Write a program to perform Constructers.
9.	Write a program to demonstrate Inheritance.
10.	Write a program to demonstrate the Exception handling.
11.	Write a program to demonstrate Cookies.
12.	Write a program to perform Event handling.

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE ENGINEERING

Big Data Analytics (Elective III)

Course Details

Class	Final Year B. Tech Sem - VII
Course Code and Course Title	PEC-ECS-701- Big Data Analytics
Prerequisites	Operating Systems, Hadoop, Java, Networking, Machine Learning and Databases
Teaching scheme: Lecture /Practical/Tutorial	3/0/0
Credits	3
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 03Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: NA	TW: 25 Marks
Practical: NA	ESE: NA

Course Objectives

1. Analyze several key technologies used in manipulating, storing, and analyzing big data.
2. Acquire clear understanding of R & Hadoop.
3. Acquire clear understanding of Integrating R & Hadoop and Acquire clear understanding of Hadoop Streaming and its importance.
4. Manage Big Data and analyze Big Data.
5. Apply tools and techniques to analyze Big Data.

Course Outcomes

Upon successful completion of this course, the students will be able to:

1. Analyze several key technologies used in manipulating, storing, and analyzing big data.
2. Acquire clear understanding of R & Hadoop.
3. Acquire clear understanding of Integrating R & Hadoop and Acquire clear understanding of Hadoop Streaming and its importance.
4. Manage Big Data and analyze Big Data.
5. Apply tools and techniques to analyze Big Data.

COURSE CONTENTS		
Unit No.1	**INTRODUCTION TO BIG DATA ANALYTICS:** Introduction to Big Data, Big Data characteristics, types of Big Data, Traditional vs. Big Data business approach. Technologies Available for Big Data, Infrastructure for Big Data, Big Data Challenges, Case Study of Big Data Solutions.	**4 Hrs.**
Unit No.2	**INTRODUCTION TO HADOOP:** Introduction to Hadoop. Core Hadoop Components, Hadoop Ecosystem, Physical Architecture, Hadoop limitations.	**5 Hrs.**
Unit No.3	**NOSQL:** Introduction to NoSQL, NoSQL business drivers, NoSQL case studies. NoSQL data architecture patterns: Key-value stores, Graph stores, Column family (Big table) stores, Document stores, Variations of NoSQL architectural patterns. Using NoSQL to manage big data: What is a big data NoSQL solution? Understanding the types of big data problems; Analyzing big data with a shared-nothing architecture; Choosing distribution models: master-slave versus peer-to-peer; Four ways that NoSQL systems handle big data problems	**6 Hrs.**
Unit No.4	**MAP REDUCE:** Map Reduce and The New Software Stack: Distributed File Systems, Physical Organization of Compute Nodes, Large Scale File-System Organization. Map Reduce: The Map Tasks, Grouping by Key, The Reduce Tasks, Combiners, Details of Map Reduce Execution, Coping with Node Failures. Algorithms Using Map Reduce: Matrix-Vector Multiplication by Map Reduce, Relational-Algebra Operations by Map Reduce, Matrix Operations, Matrix Multiplication by Map Reduce.	**6 Hrs.**
Unit No.5	**TECHNIQUES IN BIG DATA ANALYTICS:** Finding Similar Item: Nearest Neighbor Search, Similarity of Documents, Mining Data Streams: Data Stream Management Systems, DataStream Model, Examples of Data Stream Applications: Sensor Networks, Network Traffic Analysis, Link Analysis: Page Rank Definition, Structure of the web, dead ends, Using Page rank in a search engine, Efficient computation of Page Rank: Page Rank Implementation Using Map Reduce Frequent Item set Mining: Market-Basket Model, Apriori Algorithm, Algorithm of Park-Chen-Yu	**9 Hrs.**
Unit No.6	**BIG DATA ANALYTICS APPLICATIONS:** Recommendation Systems: Introduction, A Model for Recommendation Systems, Collaborative-Filtering System: Nearest Neighbor Technique, Example. Mining Social-Network Graphs: Social Networks as Graphs, Types of Social-Networks. Clustering of Social Graphs: Applying Standard Clustering Techniques, counting triangles using Map Reduce.	**6 Hrs.**

TEXT BOOKS:

1	Radha Shankarmani and M Vijayalakshmi ―Big Data Analytics‖, Wiley
2	Alex Holmes ―Hadoop in Practice‖, Manning Press, Dreamtech Press
3	Dan McCreary and Ann Kelly ―Making Sense of NoSQL‖ – A guide for managers and therest of us, Manning Press

REFERENCE BOOKS:

1	Bill Franks , ―Taming The Big Data Tidal Wave: Finding Opportunities In Huge DataStreams With Advanced Analytics‖, Wiley
2	Chuck Lam, ―Hadoop in Action‖, Dreamtech Press

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE

Internship

Course Details

Class	Final Year B. Tech Sem - VII
Course Code and Course Title	EL-ECS-701 Internship
Prerequisites	
Teaching scheme: Lecture /Practical/Tutorial	0/2/0
Credits	2
Evaluation scheme CIE/ESE for Theory	NA

Teaching scheme	Examination scheme
Lectures: NA	Theory: NA
Tutorial: NA	TW: 25 Marks
Practical: 04 Hrs. / Week	ESE: NA

Course Objectives

The course is designed to expose the students to industry environment and to take up on-site assignment as trainees or interns.

Course Outcomes

At the end of this internship the student should be able to:
1. Have an exposure to industrial practices and to work in teams
2. Communicate effectively
3. Understand the impact of engineering solutions in a global, economic, environmental, and societal context
4. Develop the ability to engage in research and to involve in life-long learning
5. Comprehend contemporary issues
6. Engage in establishing his/her digital footprint

Term Work

1. Mode of Evaluation: Internship Report, Presentation and Project Review.
2. Collect the Internship Completion Letter given by authorized industry.
3. Assess the work based on progress report (signed by industry expert).

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE

Project Phase I

Course Details

Class	Final Year B. Tech Sem - VII
Course Code and Course Title	EL-ECS-702 Project Phase I
Prerequisites	Project Phase I
Teaching scheme: Lecture /Practical/Tutorial	0/2/0
Credits	2
Evaluation scheme CIE/ESE for Theory	NA

Teaching scheme	Examination scheme
Lectures: NA	Theory: NA
Tutorial: NA	TW: 25 Marks
Practical: 04Hrs/week	ESE: 50 Marks

Course Objectives: The course aims to :	
1	Allow students to demonstrate a wide range of the skills learned at the College of Engineering during their course of study by asking them to deliver a product that has passed through the design, analysis, testing and evaluation
2	Encourage multidisciplinary research through the integration learned in a number of courses.
3	Provide a student the opportunities to apply and integrate his/her knowledge acquired throughout the undergraduate study.

Course Outcomes: After the completion of the course the student should be able to:	
1	Identify the problem statement through literature survey for project work.
2	Develop design strategy for the project work.
3	Develop presentation and interpersonal communication skills through project work.
4	Develop the ability to learn independently and to find/integrate information from different sources required in solving real-life problems.
5	enhance technical report writing skills with proper organization of materials;

1.The project is to be carried out in two semester of Final Year B. Tech (Electronics and Computer Science) Part-I and Part-II.

2.The practical batch size for project will be of 15 students. The project batch will be preferably divided into groups each consisting of not more than 3 students.

3.In semester I, group will select a project with the approval of guide and submit the synopsis of project in the first month of Semester I. The group is expected to complete detail system design, layout etc. in semester I, as a part of the term work in the form of joint report.

4.In addition, all students of project groups will deliver the seminar on the proposed project only.

5.Hardcopy of project diary should be maintained Group wise, where report of every week activity should be maintained. This should be presented at the time of examination.

6.Winter/Summer Internship/Industrial Training report should be submitted along with Seminar report on Project-I and evaluation of the same will be carried out in Final year Project Phase-I as internal assessment and marks should considered in term work by respective Guide

7.Guide of the project batch should take presentation on report of Project Phase –I along with Winter/Summer Internship/Industrial Training report. They should consider marks of the same in term work of project phase-I. and give marks out of 50.

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE

ARM & Embedded System

Course Details

Class	Final Year B. Tech Sem - VIII
Course Code and Course Title	PCC-ECS-801 ARM & Embedded system
Prerequisites	Fundamentals of Microprocessor and Microcontroller and 'C' Programming
Teaching scheme: Lecture /Practical/Tutorial	4/1/0
Credits	4+1

Evaluation scheme CIE/ESE for Practical

Teaching scheme	Examination scheme
Lectures: 04 Hrs. / Week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: NA	TW: 25 Marks
Practical: 02 Hrs. /week	ESE: 50 Marks

Course Objectives: The course aims to:	
1.	Study different concepts and programming of PIC 16F877
2.	Study different on-chip resources of PIC 16F877
3.	Study different concepts of ARM7
4.	Study Programming of ARM7
5.	Study different on chip resources of LPC 2148
6.	Understand basic concepts of RTOS

Outcomes: Upon successful completion of this course, the students will be able to:	
1.	Develop programs using PIC 16F877
2.	Apply on-chip resource facility of PIC 16F877.
3.	Understand Embedded systems and concepts of ARM7.
4.	Develop programs using ARM7
5.	Apply on chip resource facility of LPC 2148.
6.	Understand RTOS concept

COURSE CONTENTS		
Unit No.1	**INTRODUCTION TO PIC MICROCONTROLLER** Difference between RISC and CISC architecture, Features of PIC 16F877, Functional Pinout, CPU Architecture, Memory organization, register file structure, CPU Registers: Status Word, FSR, INDF, PCLATH, PCL, Instruction set, Addressing modes and Simple assembly language Programming.	**8 Hrs.**
Unit No.2	**ON-CHIP RESOURCES OF PIC 16F877** I/O Ports, Timers, CCP Module, ADC, I2C, SPI, Associate registers and programming, Interrupt structure, Configuration word, Oscillator configuration, Reset alternatives.	**8 Hrs.**
Unit No.3	**INTRODUCTION TO EMBEDDED SYSTEM AND ARM PROCESSOR EMBEDDED SYSTEM:** Embedded System definition, Types of Embedded System, Characteristics and Design issues of Embedded systems. **ARM:** Embedded system Hardware, ARM data flow model, register set, CPSR, Pipelining, Exceptions Interrupts & Vector Table, Cache and Tightly coupled memory, ARM Nomenclature.	**8 Hrs.**
Unit No.4	**INSTRUCTION SET AND PROGRAMMING** ARM Instruction set, Thumb Instruction set, Simple assembly language programming.	**7 Hrs.**
Unit No.5	**LPC 2148 MICROCONTROLLER** Features, Architecture details, Port structure, Timer/Counter, UART**,** ADC module, Embedded 'C' programming for interfacing LED's, LCD, Keyboard.	**9 Hrs.**
Unit No.6	**REAL TIME OPERATING SYSTEM (RTOS)** Introduction to RTOS concept, Embedded software architectures: Round robin, Round robin with interrupts, Function queue scheduling and Real time operating system, Tasks and Task states, Task scheduling, Shared data and Reentrancy, Semaphores and shared data using semaphores, Protecting shared data.	**8 Hrs.**

Text Books

1.	Design with PIC Microcontrollers by John B. Peatman, Pearson
2.	Embedded System Design By Frank Vahid / Tony Givargis, Wiley Publication
3.	An Embedded Software Primer, David E. Simon Pearson Education, Asia Publication
4.	ARM System Developers Guide Designing & Optimizing System Software by Andrew N., Dominic Sloss, and Chris Wright.
5.	Datasheet of PIC16F877 and LPC 2148

Reference Books

1.	Embedded systems by Raj Kamal, McGraw Hill
2.	Real- Time Systems Design and Analysis by Phillips A. Laplante, Wiley insia Edition.
3.	Embedded/ Real-Time Systems: Concepts, Design & Programming By Dr. K V K K Prasad, Dreamtech Press
4.	Embedded Systems (A contemporary design tool) by James K Peckol, Wiley Publication.

LIST OF EXPERIMENTS: (MINIMUM EIGHT (8) EXPERIMENTS)

Sr. No.	Title of Experiment
1.	To study Arithmetic and Logical instructions in PIC 16F877.
2.	To study Indirect Addressing mode in PIC 16F877.
3.	To Flash LED connected to Port using Timer delay in PIC 16F877
4.	To study any application using CCP Module in PIC 16F877
5.	To demonstrate serial communication in PIC 16F877
6.	To study Arithmetic and Logical instructions in LPC 2148
7.	To study Load and Store instructions in LPC 2148
8.	To flash the Port pin of LPC 2148 using Embedded ‘C’.
9.	To demonstrate input/ output device interfacing related programs in LPC 2148 using Embedded ‘C’.
10.	To demonstrate serial communication in LPC 2148 using Embedded ‘C’.

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE

Cyber Security

Course Details

Class	Final Year B. Tech Sem - VIII
Course Code and Course Title	PCC-ECS-802- Cyber Security
Prerequisites	Fundamental knowledge of Data Communication, Networking and Information Security.
Teaching scheme: Lecture /Practical/Tutorial	3/1/0
Credits	3+1
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 03Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: NA	TW: 25 Marks
Practical: 02 Hrs/week	ESE: NA

Course Objectives:

1. To gain knowledge about securing both clean and corrupted systems, protect personal data,

And secure computer networks

2. To examine secure software development practice

3. To understand key terms and concepts in I.T. ACT

4. To incorporate approaches for incident analysis and response

Course Outcomes:

On completion of the course, student will be able to

1. Explain the cyber security concepts.

2. Describe the cyber security vulnerabilities and prevention techniques.

3. Explain the different rules and regulations under I.T. ACT.

4. Explain the concepts of digital forensics & incident management

Unit	CONTENTS	Hours
1	**Computer and Network Security** Introduction to Computer Security - Introduction, How Seriously Should You Take Threats to Network Security? Identifying Types of Threats, Basic Security Terminology, Concepts and Approaches, Online Security Resources Networks and the Internet Introduction, Network Basics, How the Internet Works, Basic Network Utilities, Advanced Network Communications Topics	6
2	**Cyber Frauds, DoS, Viruses:** Cyber Stalking, Fraud, and Abuse: Introduction, How Internet Fraud Works, Identity Theft, Cyber Stalking, Protecting Yourself Against Cyber Crime. Denial of Service Attacks: Introduction, DoS, Illustrating an Attack, Malware: Introduction, Viruses, Trojan Horses, The Buffer-Overflow Attack. The Sassier Virus/Buffer Overflow, Spyware, Other Forms of Malware, Detecting and Eliminating Viruses and Spyware	6
3	**Techniques Used by Hackers:** Introduction, Basic Terminology, The Reconnaissance Phase, Actual Attacks, Malware Creation, Penetration Testing	6
4	**Computer Security Technology:** Introduction, Virus Scanners, Firewalls, Antispyware, IDS, Digital Certificates, SSL/TLS, Virtual Private Networks, Wi-Fi Security	6
5	**I.T. ACT:** Introduction, Cyber Security Regulations, Roles of International Law, the state and Private Sector in Cyberspace, Cyber Security Standards. The INDIAN Cyberspace, I.T. Act	6
6	**Introduction to Forensics:** Introduction, General Guidelines, Finding Evidence on the PC, Finding Evidence in System Logs, Getting Back Deleted Files, Operating System Utilities, Operating System Utilities, Mobile Forensics: Cell Phone Concepts	6
	Total	36

Text Books:

1.	Computer Security Fundamentals - Chuck Easttom, Pearson, third edition.

Reference Books:

1	Jason Luttgens, Matthew Pepe, Kevin Mandia, Incident Response & Computer Forensics, McGraw-Hill Osborne Media, 3 rd edition , 2014
2	Keith J. Jones, Richard Bejtlich, Curtis W. Rose, Real Digital Forensics: Computer Security and Incident Response, Paperback – Import, 2005.
3	John Sammons, the Basics of Digital Forensics: The Primer for Getting Started in Digital Forensics Paperback, February 24, 2012.
4	Hacking Exposed: Network Security Secrets & Solutions, Stuart McClure, Joel Scambray

	and George.Kurtz, McGraw-Hill, 2005.
5	Ethical Hacking, Thomas Mathew, OSB Publisher, 2003.
6	Dave Shackleford, Virtualization Security: Protecting Virtualized Environments, John Wiley &Sons, 2012.
7	BRAGG, Network Security: The Complete Reference, McGraw Hill Professional, 2012

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE

Web Technology

Course Details

Class	Final Year B. Tech Sem - VIII
Course Code and Course Title	PCC-ECS-803- Web Technology
Prerequisites	Basic Knowledge of OOP.
Teaching scheme: Lecture /Practical/Tutorial	3/1/0
Credits	3+1
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 03Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: NA	TW: 25 Marks
Practical: 02 Hrs/week	ESE: 50 Marks

Course Objectives:

1. To introduce students to HTML/CSS for front end design.
2. To introduce students to perform client side form validation.
3. Understand emerging Web technologies concepts and tools.
4. To enable students to write web applications/services using different technologies.

Course Outcomes:

Upon successful completion of this course, the students will be able to:

1. Apply knowledge of different HTML/CSS elements for designing web pages.
2. Construct client side scripts for validating HTML form data using Javascript technology.
3. Develop web applications using HTML/CSS/JavaScript/Server side technologies.

UNIT NO.	UNIT NAME & DETAILS	NO. OF LECTURES
1.	**HTML5 and CSS** HTML Structure, XHTML, DOCTYPE, Header Elements, Conditional Style Sheet, Structural Block Elements, Terminal Block Elements, Multipurpose Block Elements, Inline Elements, Class and ID Attributes,	5
2.	**CSS Selector and Inheritance:** Type, Class and ID Selector, Position and Group Selectors, Attribute Selectors, Pseudo-element Selectors, Pseudo- class Selectors, Subclass Selector, Inheritance, Visual Inheritance Box Model : Display, Box Model, Inline Box, Inline-Block Box, Block Box, Table Box, Absolute Box, Floated Box, Box Extends: Width, Height, Sized, Shrink, wrapped, Stretched, Box Margin, Border, Padding, Background, Overflow, Visibility, Page Break Positioning Models, Closest Positioned Ancestor, Stacking Context, Atomic, Static, Absolute, Fixed Relative, Float and Clear, Relative Float	4
3.	**JavaScript** Introduction to java script, Basic program of java script, Function & Some data types like array, object, Event in Java script, Validating HTML form data using java script, Jquery Introduction, Selectors in Jquery	5
4.	**Introducing PHP And PHP Functions** History, General Language Feature PHP Basics: Embedding PHP code in Your Web Pages, Outputting Data to the Browser, PHP supported Data Types, Identifiers, Variables, Constants, Expressions, String Interpolation, and Control Structures Functions: Invoking a Function, creating a Function, Function Libraries, Array: Creating an array, outputting a Array, Merging, slicing, splicing and Dissecting Arrays, Other useful Array Functions	5
5.	**Object-Oriented PHP, Advanced OOP Features, Strings and Regular Expressions, Working with HTML Forms.** Object-Oriented PHP: The benefits of OOP, Key OOP Concepts, Constructor and Destructors, Helper Functions. Advanced OOP Features: Object Cloning, Inheritance, Interfaces, Abstract classes, and Introducing namespaces. Strings and Regular Expressions: Regular Expressions, Other String- Specific Functions, Alternatives for Regular Expression Functions Working with HTML Forms: PHP and Web Forms, Validating Form Data Handling File, Uploads: Uploading Files with PHP	8
6.	**Using PHP with MySQL, Session Handlers** Using PHP with MySQL: Installation Prerequisites, Using the MySQL Extension, Interacting with the Database, Executing Database Transactions. Session Handlers: What Is Session Handling, Configuration Directives, Working with Sessions, Practical Session-Handling Examples, Creating Custom Session Handlers.	8

Experiment List

1. Create html pages for website like login, registration and about us pages.
2. Design created pages using CSS

Construct client-side scripts to validate HTML form data using Java script technology

3. Develop a convertor using JavaScript and HTML [e.g. length, area convertor]
4. Installing Apache and PHP on Linux, Configuring PHP at Build Time on Linux. Or
5. Installation of XAMPP.
6. Hello world Program-Embedded HTML with PHP.
7. Program based on PHP variables, Expression, arrays, control structure
8. Experiment Based on OOP and Advance OOP PHP.
9. Experiment based on form validation using PHP using regular expressions etc.
10. Experiment based on upload various types file.
11. Experiment based on send Mail using PHP.
12. Experiment based on database handling using PHP through HTML Forms. (Insert, delete,

update records)

13. Experiment based on session Management (create Login Application).
14. Installation of CMS-Joomla/ Drupal/WordPress- Install different modules, plug-ins and

learn how to customize it etc.

Text Books:

1. Pro HTML5 and CSS3 Design Patterns by Michael Bowers, Dionysios Synodinos and Victor Sumner, Apress edition

2. Beginning PHP and MySQL: From Novice to Professional, Fourth Edition - W. Jason Gilmore (Unit 4, 5, 6)

Reference Books:

1.Teach Yourself PHP, MYSQL, Apache - Julie C Meloni [SAMS Publication]

2. PHP5 and MySQL Bible Tim Converse, Joyce Park, Clark Morgan

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE

High Performance Communication Networks (Elective 1V)

Course Details

Class	Final Year B. Tech Sem - VIII
Course Code and Course Title	PEC-ECS-801- High Performance Communication Networks
Prerequisites	
Teaching scheme: Lecture /Practical/Tutorial	3/0/0
Credits	3
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 03Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: NA	TW: 25 Marks
Practical: NA	ESE: NA

Course Objectives:

The course aims to:

1. To provide students with an overview of the concepts and fundamentals of different communication networks
2. To study and utilize the frame formats used in communication networks
3. Acquire the knowledge of the interoperability of networks.
4. To understand the different advanced networks architecture and functionality.

Course Outcomes:

Upon successful completion of this course, the students will be able to:

1. Illustrate the different communication networks using the architecture and frames format
2. Design and analyzes simple communication networks
3. Compare various high-performance networks
4. Develop and research on various networks and its interoperability

Section-I

Unit	CONTENTS	Hours
1	**HISTORY OF COMMUNICATION NETWORK** History of Communication Networks, Networking principles, Review of TCP/IP, Switching, Routing. Future networks Internet, FDDI-DQDB- SMDS, Overview of ISDN & BISDN	**6 Hrs.**
2	**NETWORK SERVICES AND LAYERED ARCHITECTURE** Traffic characterization and quality of services, Network services, High performance networks, Network Elements., Layered applications, Open data network model, Network architectures, Network bottlenecks.	**6 Hrs.**
3	**ATM** Main features of ATM, Addressing, signaling and Routing, ATM header structure, ATM AAL, Internetworking with ATM.	**5 Hrs.**
4	**ADVANCED NETWORKS CONCEPTS** VPN-Remote-Access VPN, site-to-site VPN, tunneling to PPP, Security in VPN.MPLS -operation, Routing, Tunneling and use of FEC, Traffic Engineering, MPLS based VPN, overlay networks- P2P connections.	**6 Hrs.**
5	**OPTICAL NETWORKS** Optical Links, WDM system, Optical cross-connects, Optical LANs, Optical paths and networks	**5 Hrs.**
6	**VEHICULAR NETWORKS** Basic Principles and Challenges, Enabling Technologies - Communication requirements, Vehicular positioning, Vehicle sensors, Cooperative System Architecture, Routing Protocols for VANET, VANET-enabled Active Safety Applications - Infrastructure-to-vehicle applications, Vehicle-to-vehicle applications, Pedestrian-to-vehicle applications	**8 Hrs.**
	Total	

Text Books:

1. William Stallings, **"ISDN and Broadband ISDN with Frame Relay and ATM"**, 4thEdition Pearson
2. Leon Gracia, Indra Widjaja, **"Communication Networks-Fundamental Concepts and Key architectures"**, McGraw Hill Companies.
3. H. Hartenstein and K. P. Laberteaux, **"VANET: Vehicular Applications And Inter Networking Technologies"**, Wiley, 2010.

Reference Books:

1. Behrouz Forouzan, **"Data Communications and Networking"**, 4th Edition, McFrawHill Companies
2. Forouzan, **"TCP/IP Protocol Suite",** III$_{rd}$ Edition Tata Mc-Graw Hill publication
3. P. H.-J. Chong, I. W.-H. Ho, **"Vehicular Networks: Applications, Performance Analysis and Challenges"**, Nova Science Publishers, 2019.

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE

Electrical Automobiles (Elective IV)

Course Details

Class	Final Year B. Tech Sem - VIII
Course Code and Course Title	PEC-ECS-801- Electrical Automobiles
Prerequisites	Basic Electrical &Electronics, Engineering Mathematics
Teaching scheme: Lecture /Practical/Tutorial	3/0/0
Credits	3
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 03Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: NA	TW: 25 Marks
Practical: NA	ESE: NA

Course Objectives:

The course aims to:

1. To understand basics of EVs & HEVs
2. To understand basics of battery, battery charging Systems in EVs & HEVs
3. To analyze power management and grid technology
4. To understand the construction and working principle of various motors used in electric vehicles
5. To analyze design of EV and HEV
6. To analyze the effect of changing of parameters on vehicle performance

Course Outcomes:

Upon successful completion of this course, the students will be able to:

1. Know Concept of Electric Vehicles, Hybrid Electric Vehicles & Plug in Hybrid Electric Vehicles
2. Analyze the battery management system& PHEV design
3. Analyze different power converter topology used for electric vehicle application
4. Develop the electric propulsion unit and its control for application of electric vehicles
5. Design issues of EVs & HEVs
6. How to model EVs & HEVs

COURSE CONTENTS		
Unit No.1	**INTRODUCTION TO EVS & HEVS** A brief history of EV & HEV, Basics of EV & HEV, Architectures of EV & HEV, HEV fundamentals.	**6 Hrs.**
Unit No.2	**PLUG-IN HEVS** Introduction to PHEVs, PHEV architectures, Power management of PHEVs, Fuel economy of PHEVs, PHEV design & component sizing, Vehicle-to-grid technology.	**6 Hrs.**
Unit No.3	**POWER ELECTRONICS IN EVS & HEVS** Introduction, Principles of power electronics, Rectifiers, Converters, Inverters, Battery chargers used in EVs & HEVs, Emerging power electronic devices	**6 Hrs.**
Unit No.4	**ELECTRIC MACHINES & DRIVES IN EVS & HEVS** Introduction, Induction motor drives, Permanent magnet motor drives, Brushed & Brushless DC motor, Switched reluctance motors.	**6 Hrs.**
Unit No.5	**COMPONENTS & DESIGN CONSIDERATIONS OF EVS & HEVS** Batteries, Ultra capacitors, Fuel Cells, Controls, Aerodynamic considerations, Consideration of rolling resistance, Transmission efficiency, Consideration of vehicle mass, Electric vehicle chassis & body design, General issues in design.	**7 Hrs.**
Unit No. 6	**MODELLING& CASE STUDIES OF EVS & HEVS** Introduction, Fundamentals of vehicle system modelling, HEV modelling, Case studies - Rechargeable battery vehicles, Hybrid vehicles.	**5 Hrs.**

Text Books:

1	Chris Mi, M. Abul Masrur, David WenzhongGao, "Hybrid Electric Vehicles: Principles and Applications with Practical Perspectives", 2011, Wiley publication.

Reference Books:

1	MehrdadEhsani,YiminGao, Sebastien E. Gay, Ali Emadi, "Modern Electric, Hybrid Electric, and Fuel Cell Vehicles", CRC PRESS
2	Allen Fuhs, "Hybrid Vehicles and the future of personal transportation", 2009, CRC Press.
3	James Larminie, John Lowry, "Electric Vehicle Technology Explained", 2003, Wiley publication.

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE ENGINEERING

Speech Processing (Elective IV)

Course Details

Class	Final Year B. Tech Sem - VIII
Course Code and Course Title	PEC-ECS-801- Speech Processing
Prerequisites	Digital Signal Processing
Teaching scheme: Lecture /Practical/Tutorial	3/0/0
Credits	3
Evaluation scheme CIE/ESE for Theory	30/70

Teaching scheme	Examination scheme
Lectures: 03Hrs/week	Theory: 100 Marks, 70(ESE)+30(CIE)
Tutorial: NA	TW: 25 Marks
Practical: NA	ESE: NA

Course Objectives: The course aims to	
1	To understand basic acoustic theory and time domain models for speech processing.
2	To Understand sampling, quantization and different modulation techniques.
3	To Understand STFT analysis, Homomorphic Speech processing and speech synthesis
4	To Understand Linear predictive coding to enhance speech quality
5	To Understand different techniques to enhance speech quality

Course Outcomes: Upon successful completion of this course, the students will be able to:	
1	Explain the acoustic theory.
2	To Apply sampling, quantization and different modulation techniques.
3	To perform STFT analysis, Homomorphic Speech processing and speech synthesis
4	To Apply Linear predictive coding to enhance speech quality
5	To Apply different techniques to enhance speech quality

COURSE CONTENTS		
Unit No.1	**DIGITAL MODELS FOR THE SPEECH SIGNAL**: Process of speech production, Acoustic theory of speech production, Lossless tube models, and Digital models for speech signals. Time domain models for speech processing: Time dependent processing of speech, Short time energy and average magnitude, Short time average zero crossing rate, Speech vs silence discrimination using energy & zero crossings, Pitch period estimation, Pitch period estimation using autocorrelation function, Median smoothing.	**6 Hrs.**
Unit No.2	**DIGITAL REPRESENTATIONS OF THE SPEECH WAVEFORM:** Sampling speech signals, Instantaneous quantization, Adaptive quantization, Differential quantization, Delta Modulation, Differential PCM, Comparison of systems, direct digital code conversion.	**5 Hrs.**
Unit No.3	**SHORT TIME FOURIER ANALYSIS:** Linear Filtering interpretation, Filter bank summation method, Overlap addition method, Design of digital filter banks, Implementation using FFT, Spectrographic displays, Pitch detection, Analysis by synthesis, Analysis synthesis systems.	**6 Hrs.**
Unit No.4	**HOMOMORPHIC SPEECH PROCESSING**: Homomorphic systems for convolution, complex cepstrum, Pitch detection, Formant estimation, Homomorphic vocoder.	**6 Hrs.**
Unit No.5	**LINEAR PREDICTIVE CODING OF SPEECH:** Basic principles of linear predictive analysis, Solution of LPC equations, Prediction error signal, Frequency domain interpretation, Relation between the various speech parameters, Synthesis of speech from linear predictive parameters, Applications.	**6 Hrs.**
Unit No.6	**SPEECH ENHANCEMENT:** Spectral subtraction & filtering, Harmonic filtering, parametric re-synthesis, Adaptive noise cancellation. **SPEECH SYNTHESIS:** Principles of speech synthesis, Synthesizer methods, Synthesis of intonation, Speech synthesis for different speakers, Speech synthesis in other languages, Evaluation, Practical speech synthesis.	**7 Hrs.**

TEXT BOOKS:

1	L. R. Rabiner and R. W. Schafer, “Digital Processing of Speech Signals," Pearson Education (Asia) Pte. Ltd., 2004.
2	Z. Li and M.S. Drew, “Fundamentals of Multimedia,” Pearson Education (Asia) Pvt. Ltd., 2004.
3	L. R. Rabiner and B. Juang, “Fundamentals of Speech Recognition,” Pearson Education (Asia) Pte. Ltd., 2004

REFERENCE BOOKS:

1	C Becchetti& L P Ricotti, “Speech Recognition Theory & C++ Implementation” John Wiley & Sons.
2	Speech and audio processing by Dr. Shaila D. Apte
3	B. Gold & N. Morgan “Speech & Audio Signal Processing”, John Wiley & Sons.
4	D. O’Shaughnessy, “Speech Communication Human & Machine”, Universities Press.

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE ENGINEERING

Seminar

Course Details

Class	Final Year B. Tech Sem - VIII
Course Code and Course Title	HM-ECS-801- Seminar
Prerequisites	Effective English Communication, Report Writing Skills, Technical Skills.
Teaching scheme: Lecture /Practical/Tutorial	2/0/0
Credits	2
Evaluation scheme CIE/ESE for Theory	NA

Teaching scheme	Examination scheme
Lectures: 2 Hrs. / Week	Theory: NA
Tutorial: NA	TW: 50 Marks
Practical: NA	ESE: NA

Course Objectives

1. Inform latest trends in industry/ research
2. Illustrate the use of technical resources
3. Describe the technical documentation reading process
4. Guide regarding presentation skills
5. Explain the professional skills required for employability
6. Motivate for public speaking

Course Outcomes

At the end of the program learners will be able to:

1. Know the latest trend in industry/ research
2. Utilize the technical resources.
3. Read technical documents, understand it, prepare and present to audience
4. Develop presentation skills and stage daring qualities
5. Adapt and develop professional skills required for employability
6. Motivation for public speaking

General Instructions:

Every student has to give seminar on the topic selected by student / given by teacher (guide). The topic may be any recent technology, standard research paper from recognized journals, innovative project idea. Weekly schedule of the seminar will be arranged and students have to individually deliver seminar on given topic. Team of faculty members will assess the student's seminar.

Assessment method-

Assessment is based on topic selection, presentation, understanding of topic, question and answering, attendance for all sessions etc. and as determined by assessment panel.

Learning Resources

Text Books

1. Lewis Lansford and Peter Astley. Oxford English for Careers: Engineering 1: Student's Book. 2013. USA: Oxford University Press.
2. Jaimie Scanlon. Q: Skills for Success 1 Listening & Speaking. 2015. [Second Revised Edition]. Oxford: Oxford University Press.

Reference Books:

1. Sanjay Kumar and Puspalata. Communication Skills. 2015. [Second Edition] Print. New Delhi: Oxford University Press.
2. John Seely. Oxford Guide to Effective Writing and Speaking. 2013. [Third E dition].New Delhi: Oxford University Press.
3. Meenakshi Raman. Communication Skills. 2011. [Second Edition]. New Delhi: Oxford University Press.
4. Terry O‟Brien. Effective Speaking Skills. 2011. New Delhi: Rupa Publishers.

SHIVAJI UNIVERSITY, KOLHAPUR

ELECTRONICS AND COMPUTER SCIENCE ENGINEERING

Project Phase II

Course Details

Class	Final Year B. Tech Sem - VIII
Course Code and Course Title	EL-ECS-801- Professional Skills
Prerequisites	Project Phase I
Teaching scheme: Lecture /Practical/Tutorial	0/4/0
Credits	4
Evaluation scheme CIE/ESE for Theory	NA

Teaching scheme	Examination scheme
Lectures: NA	Theory: NA
Tutorial: NA	TW: 50 Marks
Practical: 8 Hrs. / Week	ESE: 100 Marks

Course Objectives: The course aims to:	
1	Allow students to demonstrate a wide range of the skills learned at the College of Engineering during their course of study by asking them to deliver a product that has passed through the design, analysis, testing and evaluation
2	Encourage multidisciplinary research through the integration learned in a number of courses.
3	Provide a student the opportunities to apply and integrate his/her knowledge acquired throughout the undergraduate study.

Course Outcomes: After the completion of the course the student should be able to:	
1	Identify the problem statement through literature survey for project work.
2	Develop design strategy for the project work.
3	Develop presentation and interpersonal communication skills through project work.
4	Develop the ability to learn independently and to find/integrate information from different sources required in solving real-life problems.
5	enhance technical report writing skills with proper organization of materials;

• The each project group of semester one will continue the project work in semester II and complete the project in all respect (assembly, testing, fabrication, tabulation, test results etc).

• Hardcopy of project diary should be maintained group wise, where report of every week activity should be maintained, which should be presented at the time of examination

• The project work along with project report should be submitted as part of Semester II on or before the last day of the semester -II.