# SRI MANAKULA VINAYAGAR
## ENGINEERING COLLEGE
(An Autonomous Institution)
### Puducherry – 605 107

*2nd - Board of Studies Meeting in the Department of*
**Computer and Communication Engineering**

for the Programme
**B.Tech – Computer and Communication Engineering**

*Venue*
Seminar Hall, Department of CCE
Sri Manakula Vinayagar Engineering College
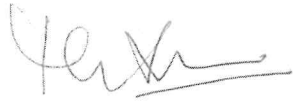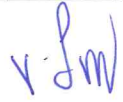Madagadipet, Puducherry – 605 107
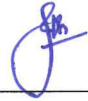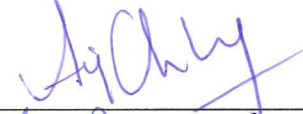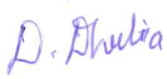
*Date & Time*
**27.03.2021& 10.30 am**

## Minutes of Board of Studies

The second Board of Studies meeting for B.Tech. Computer and Communication Engineering was held on 27th March 2021 at 10:30 A.M in the Seminar Hall, Department of CCE, Sri Manakula Vinayagar Engineering College with the Head of the Department in the Chair.

The following members were present for the BoS meeting

| Sl.No | Name of the Member with Designation and official Address | Responsibility in the BoS | Signature |
|-------|----------------------------------------------------------|---------------------------|-----------|
| 1 | Dr. V.Bharathi Professor and Head Department of CCE, SMVEC | Chairman | |
| **External Members** | | | |
| 2 | Dr. G. Nagarajan Professor, Department of ECE Pondicherry Engineering College, Puducherry | Member | |
| 3 | Dr. G. Lakshmi Sutha Professor & Head, Department of ECE, National Institute of Technology, Karaikal | Member | |

| | | | |
|---|---|---|---|
| 4 | **Dr. T. T. Mirnalinee,** Professor, Department of Computer Science and Engineering, SSN College of Engineering., Chennai | Member | |
| 5 | **Porseezhian Arumugugam** Systems Engineer-II GE Healthcare, Bengaluru | Member | |

**Internal Members**

| | | | |
|---|---|---|---|
| 6 | **Dr. S. Premkumar** Associate Professor/ECE **Specialization:** Wireless Communication | Member | |
| 7 | **Ms. V.Logisvary** Assistant Professor /ECE **Specialization:** Embedded Systems | Member | |
| 8 | **Ms. M.Julie Therese** Assistant Professor/ECE **Specialization:** IOT and Machine learning | Member | |
| 9 | **Mr. C. Sridhar** Assistant Professor/ECE **Specialization:** VLSI  Design | Member | |
| 10 | **Arokiaraj Christian St.Hubert** Assistant Professor /CSE **Specialization:** CSE | Member | |
| 11 | **Ms.P.Rajeswari** Assistant Professor /English **Specialization:** English | Member | |
| 12 | **Mrs. S.Geetha** Assistant Professor /physics **Specialization:** Physics | Member | |
| 13 | **Dr. S. Savithri** Assistant Professor /Chemistry **Specialization:** chemistry | Member | |
| 14 | **Ms. D.Dheebia** Assistant Professor /Chemistry **Specialization:** Mathematics | Member | |

**Co-opted Members**

| | | | |
|---|---|---|---|
| 16 | **Mr.V.Suresh** Sr.Lead Engineer, Qualcom, Chennai | Member (Alumni) | |

**AGENDA OF THE MEETING**

| Item No. | Particulars |
|---|---|
| BoS/UG/CCE 2.1 | Review and confirm minutes of 1st BOS meeting |
| BoS/UG/CCE2.2 | To discuss and approve the syllabi of III to IV Semesters under Regulations2020 for UG Programme: B.Tech. Computer and Communication Engineering students admitted in the year 2020-21 |
| BoS/UG/CCE 2.3 | To discuss and approve the Syllabi of Professional Elective-I offered in the IV semester under Regulations 2020 for the students admitted in the year 2020-21 |
| BoS/UG/CCE 2.4 | To discuss and approve the Syllabi of Open Elective offered in the V/VI semester under Regulations 2019 from Department of Computer and Communication Engineering to other B.Tech-Programmes |
| BoS/UG/CCE 2.5 | To discuss the skill development and certification courses in the curriculum Regulations2020for UG Programme: B.Tech. Computer and Communication Engineering for the students admitted in the year 2020-21 |
| BoS/UG/CCE 2.6 | To discuss about admission details for for UG Programme: B.Tech. Computer and Communication Engineering in the AY 2020-21 |
| BoS/UG/CCE 2.7 | To discuss about continuous assessment schedule and academic plan |
| BoS/UG/CCE 2.8 | Any other item with the permission of chair |

**MINUTES OF THE MEETING**

Dr. V.Bharathi Chairman, BoS initiated the meeting by a warm welcome and introduced the external members, the internal and co-opted members and thanked them for accepting the invitation of 2nd BoS meeting.

The Chairman proceeded with the presentation to deliberate on agenda items

| BoS/UG/CCE 2.1 | Review and confirm minutes of 1st BOS meeting held on 20.07.2020 |
|---|---|
| | The first BoS Meeting for B.Tech.-Computer and Communication Engineering under regulation 2020 held on 20-07-2020 and confirmed the following points <ul><li>Number of credits: 164</li><li>Course structure of the programme</li></ul> |

| | |
|---|---|
| | • Curriculum for I to VIII Semesters<br>• Syllabi for the semesters I and II<br>• Evaluation system<br>• Innovative teaching methodology adopted<br>• Department Vision, Mission and Program Educational objective and program Specific Outcome of the B.Tech Computer and Communication Engineering Programme<br><br>**Minutes are Reviewed and Confirmed** |
| **BoS/UG/CCE 2.2** | To discuss and approve the syllabi of III to IV Semesters under Regulations 2020 for UG Programme: B.Tech. Computer and Communication Engineering students admitted in the year 2020-21 |
| | The BoS members are discussed elaborately and reviewed the Syllabi of semesters III and IV and suggested the following points<br><br>**Semester – III**<br><br>• Suggested to include the topics of Pulse Position Modulation and Pulse width modulation in Unit-II and Convolution codes in Unit –IV in the course of "Communication Systems".<br><br>• Suggested to rename the title of the Skill Development Course 2-"Computer Graphics" into "Animation practice"<br><br>**Semester -IV**<br><br>• Overview of communication buses to be included in Unit-I and 'TCP/IP reference model' could be included in Unit-II for the course of "Principles of Data communication"<br><br>• Suggested to include "PCB Design" course in Skill Development Course 3<br><br>*Suggestions are considered and updated in the curriculum and syllabi of respective courses. The details are provided in Annexure-I*<br><br>**Approved after these minor changes and recommended to Academic Council.** |
| **BoS/UG/CCE 2.3** | To discuss and approve the Syllabi of Professional Elective-I offered in the IV semester under Regulations 2020 for the students admitted in the year 2020-21 |
| | The BoS members reviewed and discussed about syllabi of Professional Elective –I offered in fourth semester curriculum and suggested following point,<br><br>• The topic "LDPC code" to be included in the unit-IV of the course Information Coding and Theory |

| | |
|---|---|
| | *Suggestions are considered and updated in the syllabi of respective course. The details are provided in Annexure-II* |
| | **Approved the syllabi for Professional Elective-I with above mentioned change and recommended to Academic Council.** |
| **BoS/UG/CCE 2.4** | To discuss and approve the Syllabi of Open Elective offered in the V/VI semester under Regulations 2019 from Department of Computer and Communication Engineering to other B.Tech-Programmes |
| | The BoS members reviewed syllabi of Open Elective offered in the curriculum (R-2019) to other Department and suggested the following points |
| | o Suggestion has been provided to include AJAX based web application in "Web Programming" course and suggested to include recent databases |
| | o Suggested to include TCP/IP reference model in Unit –I of "Network Essentials Course" |
| | *Suggestions are considered and updated in the syllabi of respective courses. The details are provided in Annexure-III* |
| | **Approved the syllabi of Open Elective offered in the V/VI semester under R-2019 to other Department with above mentioned changes and recommended to Academic Council.** |
| **BoS/UG/CCE 2.5** | To discuss the skill development and certification courses in the curriculum Regulations 2020 for UG Programme: B.Tech. Computer and Communication Engineering for the students admitted in the year 2020-21 |
| | The BoS members reviewed, |

The BoS members reviewed,

- Induction Program organized from 28.01.2021 to 17.02.2021 to develop student skills in the academic year 2020-21
- The certification course, "Web Programming-I", conducted from 15.03.2021 to 20.03.2021
- Suggested to offer any one of the following course as Certification Course-II in Semester for the students admitted in the year 2020-2021

| Course Code | Course Title |
|---|---|
| U20CCCX04 | Advanced Python Programming |
| U20CCCX57 | Introduction to C Programming |
| U20CCX91 | Web Programming-II |

**Appreciated the conduction of certification course and induction program**

| | |
|---|---|
| **BoS/UG/CCE 2.6** | To discuss about admission details for UG Programme: B.Tech. Computer and Communication Engineering in the AY 2020-21 |
| | The BoS members reviewed the number of students admitted to the B.Tech. Computer and Communication Engineering through Centac and Management and number of girls and boys |
| | **Appreciated for the 80% of admission in the academic year 2020-21** |
| **BoS/UG/CCE 2.7** | To discuss about continuous assessment schedule and academic plan |
| | The BoS members reviewed<br><br>• Continuous assessment schedule<br>• Assignment Schedule<br>• Tentative End semester practical schedule<br>• Tentative End Semester Exam Schedule<br>• Tentative date for commencement of Even semester<br><br>**Appreciated the academic plan proposed for the B.Tech Computer and Communication Engineering programme students admitted in the academic year 2020-21** |
| **BoS/UG/CCE 2.8** | Any other suggestions for improvement<br><br>• Suggested to modify Department Vision and Mission in line with institute Vision and Mission |
| | Revised Department Vision and Mission are given in Annexure- IV<br>**Approved and  recommended to Academic Council** |

The Board of Studies resolved to approve the above suggestions for B.Tech. Computer and Communication Engineering brought forward by the Chairman incorporating the above changes.

The meeting was concluded at 12:10 PM with vote of thanks by **Dr. V. Bharathi**, Head of Department, Computer and Communication Engineering.

# Annexure –I

## (1. Revised Semester-III and IV Curriculum)

## Semester-III

| Sl. No. | Course Code | Course Title |
|---------|-------------|--------------|
| **Theory** | | |
| 1 | U20BST325 | Discrete Mathematics and Graph Theory |
| 2 | U20EST359 | Programming in C++ |
| 3 | U20EST356 | Data  Structures |
| 4 | U20CCT305 | Communication System |
| 5 | U20CCT306 | Signal Processing |
| 6 | U20CCT307 | Software Engineering |
| **Practical** | | |
| 7 | U20HSP301 | General Proficiency – I |
| 8 | U20ESP360 | Programming in C++ Laboratory |
| 9 | U20ESP357 | Data  Structures Laboratory |
| 10 | U20CCP303 | Communication System Laboratory |
| **Employability Enhancement Course** | | |
| 11 | U20CCC3XX | Certification  Course –III** |
| 12 | U20CCS302 | Skill Development Course 2* |
| | | 1)Computer on Office Automation |
| | | 2)Animation Practice |
| **Mandatory Course** | | |
| 13 | U20CCM303 | Physical Education |

## Semester-IV

| Sl. No | Course Code | Course Title |
|---|---|---|
| **Theory** | | |
| 1 | U20BST436 | Probability and Stochastic Process |
| 2 | U20EST467 | Programming in Java |
| 3 | U20CCT408 | Principles of Data Communication |
| 4 | U20CCT409 | Design and Analysis of algorithm |
| 5 | U20CCE4XX | Professional Elective - I |
| 6 | U20XXO4XX | Open Elective-I |
| Practical | | |
| 7 | U20HSP402 | General Proficiency – II |
| 8 | U20ESP468 | Programming in Java Laboratory |
| 9 | U20CCP404 | Data Communication Laboratory |
| 10 | U20CCP405 | Design and Analysis of Algorithm Laboratory |
| **Employability Enhancement Course** | | |
| 11 | U20CCC4XX | Certification Course –IV** |
| 12 | U20CCS403 | Skill Development Course 3* |
| | | 1)Computer  Hardware Trouble Shooting |
| | | 2)Mobile Servicing |
| | | 3) PCB and Circuit Design |
| **Mandatory Course** | | |
| 13 | U20CCM404 | NSS |
| **Professional Elective – I (Offered in Semester IV)** | | |
| 1 | U20CCE401 | Spread Spectrum Communication |
| 2 | U20CCE402 | Network Analysis and Management |
| 3 | U20CCE403 | Information Coding Theory |
| 4 | U20CCE404 | Computer Graphics |
| 5 | U20CCE405 | Operating System |

# (2. Revised Communication Systems Syllabus)

| U20CCT305 | COMMUNICATION SYSTEMS | L | T | P | C | Hrs |
|-----------|----------------------|---|---|---|---|-----|
|           |                      | 3 | 0 | 0 | 3 | 45  |

## Course Objectives
- To study the various analog and digital modulation techniques
- To study the pulse modulation and multiplexing
- To infer Digital transmission techniques
- To understand the principles behind information theory and coding
- To study various spread spectrum techniques

## Course Outcome

*After completion of the course, the students are able to*

**CO1-**Comprehend needs of modulation and various analog modulation techniques (**K2**)

**CO2-**Illustrate pulse modulation and multiplexing (**K3**)

**CO3-**Explain Digital transmission techniques (**K2**)

**CO4-**Interpret the principles behind information theory and coding (**K3**)

**CO5**-Describe spread spectrum communication and multiple access techniques(**K3**)

## UNIT I ANALOG COMMUNICATION                                                    (9 Hrs)
Amplitude Modulation – AM, DSBSC, SSBSC, VSB – PSD, modulators and demodulators – Angle modulation – PM and FM – PSD, modulators and demodulators – Superheterodyne receivers

## UNITII PULSE COMMUNICATION                                                    (9 Hrs)
Low pass sampling theorem – Quantization – PAM, PPM and PWM –– PCM, DPCM, DM, and ADPCM And ADM - Time Division Multiplexing, Frequency Division Multiplexing

## UNIT III DIGITAL COMMUNICATION                                                (9 Hrs)
Phase shift keying – BPSK, DPSK, QPSK – Principles of M-ary signaling M-ary PSK & QAM – Comparison, ISI – Eye pattern, equalizers

## UNIT IV INFORMATION THEORY AND CODING                                         (9 Hrs)
Measure of information – Entropy – Source coding theorem – Shannon–Fano coding, Huffman Coding, Channel capacity – Shannon-Hartley law – Shannon's limit – Error control codes – Linear Block codes-Cyclic codes and convolutional codes- Syndrome calculation

## UNIT V SPREAD SPECTRUM AND MULTIPLE ACCESS                                     ( 9Hrs)
PN sequences – properties – m-sequence – DSSS – Processing gain, Jamming – FHSS – Synchronization and tracking – Multiple Access – FDMA, TDMA, CDMA

## Text Books
1. H Taub, D L Schilling, G Saha, "Principles of Communication Systems", 3rd edition, TMH 2007
2. S. Haykin, "Digital Communications",  John Wiley 2005
3. B.P.Lathi," Modern Digital and Analog Communication Systems", 3rd edition, Oxford University Press, 2007

## Reference Books
1. H P Hsu, Schaum Outline Series, "Analog and Digital Communications", TMH 2006
2. B.Sklar," Digital Communications Fundamentals and Applications", 2nd edition Pearson Education 2007.
3. A.Bource Carson and Paul B.Crilly, "Communication Systems", 5th Edition, Mc Graw Hill, 2010
4. Torrieri, Don, "Principles of Spread Spectrum Communication Systems", Springer, 2015
5. Simon Haykin, "Communication Systems", 4th Edition, John Wiley and Sons, 2001.

**Web References**

1. www.allaboutcircuits.com
2. https://nptel.ac.in/courses/108/102/108102096/
3. http://www.electronics-tutorials.ws
4. www.tutorialspoint.com
5. https://nptel.ac.in/courses/108/104/108104091/

## COs/POs/PSOs Mapping

| COs | Program Outcomes (POs) | | | | | | | | | | | | Program Specific Outcomes (PSOs) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| **1** | 3 | 1 | 2 | 1 | - | - | - | - | - | 1 | - | 1 | 2 | 2 | - |
| **2** | 3 | 1 | 2 | 1 | - | - | - | - | - | 1 | - | 1 | 2 | 2 | - |
| **3** | 3 | 1 | 2 | 1 | - | - | - | - | - | 1 | 1 | 1 | 2 | 2 | - |
| **4** | 3 | 1 | 2 | 2 | - | - | - | - | 1 | 1 | 1 | 1 | 2 | 2 | - |
| **5** | 3 | 1 | 2 | 1 | - | - | - | - | 1 | 1 | 1 | 1 | 2 | 2 | - |

Correlation Level: 1-Low, 2-Medium, 3- High

# (3. Revised syllabus of Principles of Data Communication)

| **U20CCT408** | **PRINCIPLES OF DATA COMMUNICATION** | **L** | **T** | **P** | **C** | **Hrs** |
|---|---|---|---|---|---|---|
| | | **3** | **0** | **0** | **3** | **45** |

**Course Objectives**
- To learn about data transmission media
- To understand the components required to build different types of network.
- To understand the routing in the network.
- To familiarize the functions and protocols of each layer of TCP/IP protocol suite.
- To understand application layer protocols

**Course Outcomes**
*After completion of the course, the students will be able to*
**CO1**- Explain Data Communications System and its components (**K2**)
**CO2**- Describe the concepts of layer models(**K3**)
**CO3**- Evaluate the routing in network layer(**K3**)
**CO4** - Use functionalities and protocols of each layer of TCP/IP protocol suite. (**K3**)
**CO5** -.Interpret application layer protocols(**K3**)

**UNIT I DATA COMMUNICATIONS** **(9 Hrs)**
Transmission – Impairments – Bandwidth Limitations – Modulation – Frequency Spectrum – Multiplexing – Encoding Techniques – Transmission Media - Copper – Fiber – Optical – Radio (wireless) –Overview of communication buses- Cable Pinouts – Crossover – Straight Through - Rollover

**UNIT II LAYER   MODELS** **(9 Hrs)**
Evolution of Computer Networking – Layered Architecture – ISO/OSI Model –TCP/IP reference mdoel Internet Architecture - Link Layer – Framing – Addressing – Error Detection/Correction – Multiple Access Protocols – Address Resolution Protocol (ARP)- B-ISDN- ATM

**UNIT III NETWORK LAYER** **(9 Hrs)**
 Ethernet Basics – CSMA/CD – Frame Format – Switching – Types (datagram, virtual) – Hubs, Bridges, Switches – Virtual LAN (VLAN) – Wireless LAN (802.11) – WAN Technologies –– Frame Relay – MPLS-Network Address Translation – BOOTP/DHCP-ICMP – Routing Principles – Distance Vector Routing(RIP) – Link State Routing (OSPF) – Path Vector Routing (BGP)

**UNIT IV TRANSPORT LAYER** **(9 Hrs)**
Transmission Control Protocol (TCP) /IP suite -End to End Protocols – Connectionless Transport – User Datagram Protocol (UDP) – Reliable Data Transfer – Connection Oriented Transport - - Flow Control – Congestion Control – Transport Layer Alternatives (RPC) – Transport for Real Time Application

**UNIT V  APPLICATION LAYER** **(9 Hrs)**
Application Layer Protocols – HTTP – FTP – Telnet – Email – DNS – Application Performance – Performance Metrics Internet Protocol – IPV4 Packet Format – IP Addressing – Subnetting – Variable Length Subnet Mask(VLSM) – Classless Inter Domain Routing (CIDR) – Private Addressing –) – Router Internals – IPV6 – Quality of Service (QoS)

**Text Books**

1. James F. Kurose, Keith W. Ross, "Computer Networking, A Top-Down Approach Featuring the Internet", 7th Edition, Pearson Education, 2017.
2. Larry L. Peterson, Bruce S. Davie, "Computer Networks: A Systems Approach", 5th Edition, Morgan Kaufmann Publishers Inc., 2011.
3. William Stallings, "Data and Computer Communications", 10th Edition, Pearson Education, 2013.

**Reference Books**

1. Douglas E. Comer, "Internetworking with TCP/IP (Volume I) Principles, Protocols and Architecture", 6th Edition, Pearson Education, 2013.
2. Nader F. Mir, "Computer and Communication Networks", 2nd Edition, Prentice Hall, 2014.
3. Ying-Dar Lin, Ren-Hung Hwang and Fred Baker, "Computer Networks: An Open Source Approach", McGraw Hill Publisher, 2011.
4. Behrouz A. Forouzan and Firouz Mosharraf, "Computer Networks a Top Down Approach", Tata McGraw-Hill, 2017.
5. Rich Seifert, James Edwards, "The All New Switch Book: The Complete Guide to LAN Switching Technology", 2nd Edition , Wiley Publishing Inc, 2011

**Web Reference**

1. https://tinyurl.com/ycy6x454
2. https://tinyurl.com/yapn9ac7
3. https://tinyurl.com/ydf33ye6
4. https://nptel.ac.in/courses/106/105/106105081/
5. https://nptel.ac.in/courses/106/105/106105183/

**COs/POs/PSOs Mapping**

| COs | Program Outcomes (POs) | | | | | | | | | | | | Program Specific Outcomes (PSOs) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| **1** | 3 | 1 | 2 | 1 | - | - | - | - | - | 1 | - | 1 | 2 | 3 | - |
| **2** | 3 | 1 | 2 | 1 | - | - | - | - | - | 1 | - | 1 | 2 | 3 | - |
| **3** | 3 | 1 | 2 | 2 | - | - | - | - | 1 | 1 | 1 | 1 | 2 | 3 | - |
| **4** | 3 | 1 | 2 | 1 | - | - | - | - | 1 | 1 | 1 | 1 | 2 | 3 | - |
| **5** | 3 | 1 | 2 | 2 | - | - | - | - | 1 | 1 | 1 | 1 | 2 | 3 | - |

Correlation Level: 1-Low, 2-Medium, 3- High

# (4. Syllabus of Skill Development Course "PCB and Circuit Design")

| U20CCS403 | 3. PCB AND CIRCUIT DESIGN | L | T | P | C | Hrs |
|---|---|---|---|---|---|---|
| | | 0 | 0 | 2 | - | 30 |

## Course Objectives
- To understand the fundamental concepts in circuit design
- To know about the PCB design and construction along with its types
- To get a basic idea about Proteus software.
- To perform design synchronization with schematic tool
- To study about routing guidelines

## Course Outcomes
*After completion of the course, the students are able to*
**CO1** - Infer the fundamental of circuit design (K2)
**CO2**–Describes PCB design and its types (K2)
**CO3** –Demonstrate the Proteus PCB schematic (K3)
**CO4**–Examines the design synchronization (K4) **CO5**–
Tests the various routing guidelines (K4)

**1. Introduction to Circuit Designing:** Fundamental of circuit design - Creating New Components - Introduction to Analog Circuit Design - Introduction to Digital Circuit Design - Placing Symbols and Ports - Labeling components - Circuit optimization

**2. Introduction to PCB Design** - Definition and Evolution of PCB - Purposes of a PCB - Types of PCBs - Creating the Blank PCB - Defining a sheet template - Printed Circuit Technology - PCB Construction (Power and Ground Plane) - PCB Printing & Etching process

**3. Proteus PCB Schematic** - Defining the Board Shape & Placement Boundary - Creating a board outline & placement / routing boundary - Basic concepts of PCB Designing - Schematic capture - From schematic to PCB - Placing, editing, and connecting parts and electrical symbols - Adding and editing graphics and text

**4. Proteus PCB Editor** - Creating and editing parts - Preparing to create a net list - Creating a net list - Exporting and importing schematic data - PCB Material. - Board Layers, Colors and Grids. - Defining the Electrical/Mechanical Layer - Defining PWR/GND layers.

**5. Design Transfer to the PCB and Design Rule Check** - Design synchronization with schematic tool. - Design transfer using a Net list. - Design rules concepts. - Design Rule Checking

**6. Component Placement & Shielding** - Placing components. - Finding components for placement. - Moving components. - Shielding Practices. - Copper Pour

**7. Routing PCB Layout Routing and Grounding** - Routing guidelines

**Reference Books:**
1. Bruce R. Archambeault , James Drewniak "PCB Design for Real-World EMI Control", Springer-Verlag New York Inc., United States, 2002.
2. Kraig Mitzner, "Complete PCB Design Using OrCAD Capture and PCB Editor", ELSEVIER SCIENCE & TECHNOLOGY, Oxford, United Kingdom, 2009.
3. Keng Tiong Ng , "PCB-RE: Real-World Examples", Independently Published, 2019.
4. Roger Hu, "PCB Design and Layout Fundamentals for EMC",Independently Published, 2019.
5. Matthew Scarpino, "Designing Circuit Boards with EAGLE: Make High-Quality PCBs at Low

Cost", Pearson Education, United States, 2014.

**Web References**

1. https://engineering.eckovation.com/learn-design-pcb/
2. https://www.tronicszone.com/blog/steps-pcb-design-manufacturing/
3. https://www.elprocus.com/what-is-printed-circuit-board-and-designing-process-of-pcb/
4. https://www.electronics-notes.com/articles/analogue_circuits/pcb-design/how-to-design-pcb-board-basics.php
5. https://resources.pcb.cadence.com/blog/2019-what-is-the-pcb-fabrication-process-an-introduction

**COs /POs/PSOs Mapping**

| COs | Program Outcomes (POs) | | | | | | | | | | | | Program Specific Outcomes (PSOs) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| **1** | 3 | 2 | 2 | 1 | 3 | - | - | - | 3 | 2 | 2 | - | 3 | 3 | 1 |
| **2** | 3 | 2 | 2 | 1 | 3 | - | - | - | 3 | 2 | 2 | - | 3 | 3 | 1 |
| **3** | 3 | 2 | 2 | 1 | 3 | - | - | - | 3 | 2 | 2 | - | 3 | 3 | 1 |
| **4** | 3 | 2 | 2 | 1 | 3 | - | - | - | 3 | 2 | 2 | - | 3 | 3 | 1 |
| **5** | 3 | 2 | 2 | 1 | 3 | - | - | - | 3 | 2 | 2 | - | 3 | 3 | 1 |

Correlation Level: 1-Low, 2-Medium, 3- High

# Annexure-II

# (1. Revised Syllabus of Information Theory and Coding)

| U20CCE403 | INFORMATION THEORY AND CODING` | L | T | P | C | Hrs |
|---|---|---|---|---|---|---|
| | | 3 | 0 | 0 | 3 | 45 |

## Course Objectives

- To introduce the basic notions of information and channel capacity.
- To acquire knowledge on Source coding of text, Audio and speech
- To understand source coding of image and video
- To formulate error control coding and decoding techniques applied in communication Systems
- To introduce convolution codes for performance analysis

## Course Outcomes

*After completion of the course, the students will be able to*

**CO1** – Describe the channel performance using Information theory. (**K2)**
**CO2** – Apply Source coding of text, Audio and speech coding algorithms (**K3**)
**CO3** – Describe source coding techniques of image and video (**K2**)
**CO4-** Apply error control codes in Communication systems (**K3**)
**CO5**– Apply convolution codes for performance analysis (**K3**)

## UNIT I INFORMATION THEORY                                                                (9Hrs)

Information – Entropy, Information rate, classification of codes, Kraft McMillan inequality, Source coding theorem, Shannon-Fano coding, Huffman coding, Extended Huffman coding - Joint and conditional entropies, Mutual information - Discrete memoryless channels – BSC, BEC – Channel capacity, Shannon limit.

## UNIT II SOURCE CODING: TEXT, AUDIO AND SPEECH                                    (9Hrs)

Text: Adaptive Huffman Coding, Arithmetic Coding, LZW algorithm – Audio: Perceptual coding, Masking techniques, Psychoacoustic model, MEG Audio layers I,II,III, Dolby AC3 - Speech: Channel Vocoder, Linear Predictive Coding

## UNIT III SOURCE CODING: IMAGE AND VIDEO                                             (9Hrs)

Image and Video Formats – GIF, TIFF, SIF, CIF, QCIF – Image compression: READ, JPEG – Video Compression: Principles-I,B,P frames, Motion estimation, Motion compensation, H.261, MPEG standard

## UNIT IV ERROR CONTROL CODING: BLOCK CODES                                       (9Hrs)

Definitions and Principles: Hamming weight, Hamming distance, Minimum distance decoding - Single parity codes, Hamming codes, Repetition codes - Linear block codes, Cyclic codes - Syndrome calculation, Encoder and decoder – CRC

## UNIT V ERROR CONTROL CODING: CONVOLUTIONAL CODES                        (9Hrs)

Convolutional codes – code tree, trellis, state diagram - Encoding – Decoding: Sequential search and Viterbi algorithm – Principle of Turbo coding -LDPC

## Text Books

1. Nilotpal Manna, Arijit Saha "Information Theory, Coding and Cryptography" Pearson Education, 1st Edition, 2013
2. Andre Neabauer, Jurgen Freudenberger, Volker Kuhn "Coding Theory: Algorithms, Architectures & Applications", Wiley Publications, 2011.
3. R Bose, "Information Theory, Coding and Cryptography", Tata McGraw-Hill, 3rd Edition, 2016

## Reference Books

1. K Sayood, "Introduction to Data Compression" 3/e, Elsevier 2006
2. S Gravano, "Introduction to Error Control Codes", Oxford University Press 2007
3. Amitabha Bhattacharya "Digital Communication", TMH 2006
4. Fred Halsall, "Multimedia Communications: Applications, Networks, Protocols And Standards", Pearson Education Asia, 2002
5. Simon Haykin, "Communication Systems", fourth edition, John Wiley & Sons, 2008

### Web References
1. https://onlinelibrary.wiley.com/doi/full/10.1002/inf2.12016
2. https://nptel.ac.in/courses/117/101/117101053/
3. https://en.wikipedia.org/wiki/Information_theory
4. https://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=18
5. https://www.codeandtheory.com/

## COs/POs/PSOs Mapping

| COs | Program Outcomes (POs) | | | | | | | | | | | | Program Specific Outcomes (PSOs) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| **1** | 3 | 1 | 2 | 1 | - | - | - | - | - | 1 | - | 1 | 1 | 2 | - |
| **2** | 3 | 1 | 2 | 1 | - | - | - | - | - | 1 | - | 1 | 1 | 2 | - |
| **3** | 3 | 1 | 2 | 1 | - | - | - | - | - | 1 | 1 | 1 | 1 | 2 | - |
| **4** | 3 | 1 | 2 | 1 | - | - | - | - | - | 1 | 1 | 1 | 1 | 2 | - |
| **5** | 2 | 1 | 1 | 1 | - | - | - | - | - | 1 | 1 | 1 | 1 | 2 | - |

Correlation Level: 1-Low, 2-Medium, 3- High

# Annexure-III

# (1. Revised Syllabus of Web Programming)

| U19CCO54/ U19CCO64 | **WEB PROGRAMMING** (Common to EEE,ECE, MECH, CIVIL, ICE MECHATRONICS, BME) | L 3 | T - | P - | C 3 | Hrs 45 |
|---|---|---|---|---|---|---|

## Course Objectives
- To Learn the fundamentals of web application development
- To understand the design components and tools using CSS
- To Learn the concepts of JavaScript and programming fundamentals.
- To understand the working procedure of XML
- To study about advance scripting and Ajax applications

## Course Outcomes
*After completion of the course, the students will be able to*
**CO1** - Comprehend basic web applications using HTML**(K2)**
**CO2** - Use CSS to design web applications **(K3)**
**CO3** - Use java scripts functions for the web page creation **(K3)**
**CO4** - Explain XML structure**(K2)**
**CO5** - Demonstrate the web 2.0 application to advance scripts**(K2)**

## UNIT - I INTRODUCTION TO WWW & HTML (9 Hrs)
Protocols, secure connections, application and development tools, the web browser, What is server, dynamic IP, Web Design: Web site design principles, planning the site and navigation. **HTML:** The development process, Html tags and simple HTML forms.

## UNIT – II STYLE SHEETS (9 Hrs)
**CSS:** Need for CSS, Introduction to CSS, basic syntax and structure, using CSS, background images, colors and properties, manipulating texts, using fonts, borders and boxes, margins, padding lists, positioning using CSS, CSS2.

## UNIT - III JAVA SCRIPTS (9 Hrs)
Client side scripting, JavaScript, develop JavaScript, simple JavaScript, variables, functions, conditions, loops and repetition.

## UNIT –IV XML (9 Hrs)
**XML:** Introduction to XML, uses of XML, simple XML, XML key components, DTD and Schemas, Well formed, using XML with application XML, XSL and XSLT. Introduction to XSL, XML transformed simple example, XSL elements, transforming with XSLT.

## UNIT –V ADVANCE SCRIPT (9 Hrs)
JavaScript and objects, JavaScript own objects, the DOM and web browser environments, forms and validations **DHTML:** Combining HTML, CSS and JavaScript, events and buttons, controlling your browser, **AJAX**: Introduction, advantages & disadvantages, AJAX based web application, alternatives of AJAX.

## Text Books
1. Ralph Moseley, M.T. Savaliya, "Developing Web Applications", BPB Publications, 2017.
2. Hirdesh Bhardwaj,, "Web Designing", Pothi.com, 2016
3. P.J. Deitel and H.M. Deitel, Internet and World Wide Web - How to Program, Pearson Education, 2009.

## Reference Books

1. Ralph Moseley, "Developing Web Applications", Wiley India Pvt. Ltd, 2013
2. Joel Sklar, " Principles of Web Design", 6th edition, Cengage Learning, Inc, 2014

3.  B. M. Harwani," Developing Web Applications in PHP and AJAX", Tata McGraw-Hill Education, 2010
4.   UttamK.Roy, Web Technologies, Oxford University Press, 2010.
5.  Rajkamal, Web Technology, Tata McGraw-Hill, 2009.

## Web References

1. https://nptel.ac.in/courses/106/106/106106156/
2. https://www.coursera.org/learn/html-css-javascript-for-web-developers
3. https://code.tutsplus.com/courses/how-to-become-a-web-developer
4. https://webdesignerwall.com/
5. https://www.smashingmagazine.com/

**COs/POs/PSOs Mapping**

| COs | Program Outcomes (POs) | | | | | | | | | | | | Program Specific Outcomes (PSOs) | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| 1 | 2 | 1 | 1 | 1 | 2 | 1 | - | - | - | - | - | 1 | | | |
| 2 | 2 | 1 | 2 | 1 | 2 | 1 | - | - | - | - | - | 1 | | | |
| 3 | 2 | 1 | 2 | 1 | 2 | 1 | - | - | - | - | - | 1 | | | |
| 4 | 2 | 1 | 1 | 1 | 2 | 1 | - | - | - | - | - | 1 | | | |
| 5 | 2 | 1 | 1 | 1 | 2 | 1 | - | - | - | - | - | 1 | | | |

**Correlation Level: 1-Low, 2-Medium, 3- High**

# (2.Revised Syllabus of Network Essentials)

**U19CC053/**
**U19CC063**

**NETWORK ESSENTIALS**
**(Common to EEEMECH, CIVIL, ICE MECHATRONICS, BME)**

| L | T | P | C | Hrs |
|---|---|---|---|---|
| 3 | 0 | 0 | 3 | 45 |

## Course Objectives

- To understand the fundamental concepts of computer communication and data networks
- To gain the necessary knowledge and skills to work effectively with network engineering and administrators
- To learn how to research ,communicated network and IT issuing by reading relevant industry information
- To understanding the basic technologies and step required for setting up managing small LAN
- To understand the various technologies of security to protect the information in network

## Course Outcomes

*After completion of the course, the students will be able to*

**CO1-** Understand the basic knowledge and skills to implement defined network architecture
**CO2**- Explain the performances of data link control and their access medium
**CO3-** Describe about internet Protocol and their working processes in IPV.
**CO4**- Explain the basic concepts of Transport Protocols and working of TCP layer
**CO5**- Design and study the operations of Security and their different algorithm

## UNIT I NETWORK MODELS                                                    (9 Hrs)

Data communications- Networks-PAN,LAN, MAN and WAN- Internet, Intranet and Extranets- Protocols and standards- OSI/ISO reference model- TCP/IP protocol suite-Broadband ISDN-ATM protocol reference model-- SONET/SDH architecture-Bluetooth and UWB –WiFi-WiMax Cognitive Radios- Adhoc and Sensor Networks-Green communications.

## UNIT II DATA LINK CONTROL AND MEDIUM ACCESS                    (9 Hrs)

Types of errors- Error detection and correction- Checksum- Framing-Flow control-Stop and wait protocol- Go-back N- Selective repeat protocols HDLC-Random access protocols- Controlled access- Wired LANs- IEEE standards, IEEE 802.3, 802.4, 802.5 and 802.6- - Fast Ethernet- Gigabit Ethernet – Wireless LANs- IEEE 802.11.

## UNIT III    NETWORK ROUTING                                           (9 Hrs)

Logical addressing- IPv4 addresses- IPv6- Internet protocol- Transition from IPv4 to IPv6- Mapping logical to physical address- Mapping physical to logical address- ICMP-Direct Vs indirect delivery- Forwarding-Unicast  and Multicast routing protocols- Different Routing Algorithms-Internetworking- Routers and gateways.

## UNIT IV TRANSPORT AND CONGESTION                                   (9 Hrs)

Elements of Transport Protocols: addressing, Connection Establishment, Connection Release, Error Control and Flow Control – Congestion control: Desirable Bandwidth Allocation, Regulating the Sending Rate, Wireless Issues- UDP, RPC -TCP Protocol, TCP connection management, TCP sliding window and congestion control.

## UNIT V SECURITY                                                          (9 Hrs)

Introduction to Cryptography, Cipher text, symmetric key cryptography – AES and DES, RSA public key and private keys- Digital signature .Security in the Internet: IPSec, PGP, VPN and Firewalls.

Authentication Protocols: Shared Secret Key, The Diffie-Hellman Key Exchange, Authentication Using Kerberos. Wireless Security- issues and challenge

## Text Books

1. William Stallings, "Data and computer communications", Ninth Edition,Pearson Education, New Delhi, 2014.
2. Behrouz. A. Forouzan, "Data Communication and Networking", Fifth Edition,McGraw Hill, New Delhi, 2013.
3. Pallapa Venkatram and Sathish Babu.B, "Wireless &Mobile Network security ",Tata McGraw Hill, New Delhi, 2010

## Reference Books

1. Douglas E. Comer, "Internetworking with TCP/IP (Volume I) Principles, Protocols and Architecture",6th Edition, Pearson Education, 2013.
2. Nader F. Mir, "Computer and Communication Networks", 2nd Edition, Prentice Hall, 2014.
3. Ying-Dar Lin, Ren-Hung Hwang and Fred Baker, "Computer Networks: An Open Source Approach",McGraw Hill Publisher, 2011.
4. Behrouz A. Forouzan and Firouz Mosharraf, "Computer Networks a Top Down Approach", TataMcGraw-Hill, 2017.
5. Rich Seifert, James Edwards, "The All New Switch Book: The Complete Guide to LAN SwitchingTechnology", 2nd Edition , Wiley Publishing Inc, 2011

## Web References

4. https://tinyurl.com/ycy6x454
5. https://tinyurl.com/yapn9ac7
6. https://tinyurl.com/ydf33ye6
4. https://nptel.ac.in/courses/106/105/106105081/
5. https://nptel.ac.in/courses/106/105/106105183/

**COs/POs/PSOs Mapping**

| COs | Program Outcomes (POs) | | | | | | | | | | | | Program Specific Outcomes (PSOs) | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| **1** | 2 | 1 | 1 | 1 | | 1 | - | - | - | - | - | 1 | | | |
| **2** | 2 | 1 | 2 | 1 | | 1 | - | - | - | - | - | 1 | | | |
| **3** | 2 | 1 | 2 | 1 | | 1 | - | - | - | - | - | 1 | | | |
| **4** | 2 | 1 | 1 | 1 | | 1 | - | - | - | - | - | 1 | | | |
| **5** | 2 | 1 | 1 | 1 | 1 | 1 | - | - | - | - | - | 1 | | | |

**Correlation Level: 1-Low, 2-Medium, 3- High**

# Annexure-IV

# Department of Computer and Communication Engineering

## Vision

To promote students with latest technology and research in the field of Computer and Communication Engineering to meet global socio-economic needs

## Mission

| | |
|---|---|
| **M1: Technical Knowledge** | To provide academic excellence in the field of computer and communication engineering to meet the needs of the Society. |
| **M2: Innovation and Research Exposure** | To conduct recognized research analytically in multi- disciplinary areas of the framework at National and International levels |
| **M3: Employability and Entrepreneurship** | To provide complementary technical, inter and intrapersonal skills for employability and entrepreneurship |
| **M4 - Ethics** | To evolve integrity, ethical principles and interactive skills among the students to form a better nation |