

SHRI VENKATESHWARA UNIVERSITY



Syllabus
DIPLOMA

Electronic & Communication Engineering

VI SEMESTER

(Three Years Programme)

(w.e.f. 2019-20)

**SCHOOL OF ENGINEERING &
TECHNOLOGY**

Electronic & Communication Engineering
SEMESTER- V

Sl No.	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	PEC- 601	Computer Networking and Data Communication	3	0	0	20	10	30		70		100	3
2	PEC-602	Mechatronics	3	0	0	20	10	30		70		100	3
3	PEC-603	Artificial Intelligence	3	0	0	20	10	30		70		100	3
4	PSE- 666	Entrepreneurship and Start- ups	3	0	0	20	10	30		70		100	3
5	PEC-611	Computer Networking and Data Communication Lab	0	0	2				10		15	25	1
6	PEC-612	Project Phase -II	0	0	12				100		100	200	6
7	PEC-613	Seminar	1	0	0				50			50	1
8	AUD- 111	Indian Constitution	2	0	0								0
Indian Constitution - Noncredit Mandatory courses												675	20

Course Code	:	PEC--601
Course Title	:	Computer Networking and Data Communication
Number of Credits	:	3 (L: 3, T: 0, P: 0)
Prerequisites	:	NIL
Course Category	:	PC

Course Content:

Unit 1 - Introduction to data communication.

Concept of analog and digital signals. Bandwidth. Network architecture.

Basics of OSI and TCP/IP reference models.

Types of Computer Networks – Personal Area Network, Local Area Network, Metropolitan Area Network, Wide Area Network, Internetwork.

Computer Network Topologies – Point to Point, Bus topology, Star topology, ring topology, mesh topology, tree topology, Daisy Chain, Hybrid Topology,

Computer Network Model. Transmission media. Wired and wireless connectivity.

Unit 2 – Digital & Analog Transmission.

Digital Transmission – Digital to Digital Conversion, Line Coding, Unipolar Encoding, Polar Encoding, Bipolar Encoding, block Coding

Analog Transmission - Analog-to-Digital Conversion, Digital to analog Conversion, Analog to Analog Conversion.

Sampling, Quantization, Encoding, Transmission Modes.

Unit 3 – Wireless Communication.

Radio, Microwave, Infra-red, Light Transmission.

Wireless Communication Standards, Characterization of the Wireless Channel, Receiver Techniques for Fading Dispersive Channels,

Mobility Management in Wireless Networks, Mobile IP, Mobile Ad hoc Networks, Ad hoc Routing Protocols, Performance Analysis of DSR and CBRP,

Cluster Techniques, Incremental Cluster Maintenance Scheme, Space time Coding for Wireless Communication.

Unit 4 – Data Link Layer Technologies.

Types of Network Routing, Network Layer Protocols. FDM, TDM and CDMA.

Circuit and packet switching. Frame relay and ATM switching. ISDN. Local area network protocols. Fibre optic networks. Satellite networks.

Data link layer design issues: its functions and protocols. Internet protocol. Routing algorithms. Congestion control algorithms. IP addressing schemes. Internetworking and sub-netting.

Error Detection and Correction - Types of Errors, Detection, Correction Switching and Data link layer, data link control and protocols

Unit 5 - Transmission Media & Transmission Control protocol.

Magnetic Media, Twisted Pair Cable, Coaxial Cable, Power Lines, Fiber Optics.

Protocol- Features, Header, Addressing, Connection Management, Error Control and Flow Control, Multiplexing, Congestion Control, Timer Management, Crash Recover

REFERENCES / SUGGESTED LEARNING RESOURCES:

S. No.	Title of Book	Author	Publication
1.	Computer Networking A top down Approach:	J.F.Kurose	Pearson
2.	Computer Networks and Internet	D.E. Comer	Pearson
3.	Wireless Communications: Principles and Practice, 2nd edition	T. Rappaport	Prentice Hall, 2002
4.	Wireless Communication and Networking	John W. Mark, Weihua Zhuang	
5.	Modelling and Analysis of Computer Communication Networks	Jeremiah F. Hayes	
6.	Data communication & Networking	Stallings	

SUGGESTED SOFTWARE/LEARNING WEBSITES:

- www.tutorialspoint.com/data_communication_computer_network/data_communication_computer_network_tutorial.pdf
- www.turbofuture.com/industrial/Elements-of-Electronic-Communications-System
- www.st-andrews.ac.uk/~www_pa/Scots_Guide/iandm/part3/page1.html
- www.antenna-theory.com/basics/main.php
- www.explainthatstuff.com/antennas.html
- www.circuitdiagram.org/am-radio-receiver-with-mk484.html
- www.circuitstoday.com/single-chip-fm-radio-circuit

Course Code	:	
Course Title	:	Mechatronics
Number of Credits	:	3
Prerequisites (Course code)	:	None
Course Category	:	OE

Course Content:

Unit 1 – Introduction to Mechatronics

- Introduction to System Concepts, Analysis and Design
- Mechatronics basic definitions; systems and components;
- Systems with mixed disciplines
- Electronics Fundamentals Review

Unit 2 – Elements in Mechatronics

- Data conversion devices, sensors, micro-sensors, transducers, signal processing devices, timers
- Microprocessors, Microcontrollers
- PID Controllers and PLCs

Unit 3 – Drives

- Stepper Motors, Servo Drives

- Linear Motion bearings, cams
- Systems controlled by camshafts, electronic cams
- Tool magazines and indexing mechanisms.

Unit 4 – Hydraulic Systems

- Flow, Pressure and Direction Control Valves
- Actuators, Supporting Elements, Hydraulic Power Packs, Pumps
- Design of Hydraulic circuits

Unit 5 – Pneumatic System

- Production, Distribution and conditioning of compressed air
- System Components and Graphic representations
- Design of Systems

SUGGESTED LEARNING RESOURCES:

S.No.	Title of Book	Author	Publication
1.	Analysis and design of Dynamic Systems	Cochin, Era and Cadwallender	AddisonWesley, 1997
2.	Mechatronics Engineering	Tomkinson, D. And Horne, J. Longman	McGraw Hill, 1996
3.	Mechatronics	Bolton, W	Pearson

S.No.	Title of Book	Author	Publication
4.	Fundamental of mecha- tronic	M. Jouaneh	Cengage Learning ISBN – 978-1111569020
5.	Mechatronics – An Inte- grated Approach	Clarence W. de Silva	CRC Press ISBN – 978-0849312748

SUGGESTED SOFTWARE/LEARNING WEBSITES:

6. https://youtu.be/Ro_tFv1iH6g
7. <https://www.motioncontroltips.com/faq-what-are-stepper-drives-and-how-do-they-work/>
8. <https://science.howstuffworks.com/robot.htm>
9. <https://howtomechatronics.com/>

Course Code	:	PEC-611
Course Title	:	Computer Networking and Data Communication Lab
Number of Credits	:	1 (L : 0 , T : 0, P : 2)
Prerequisites	:	NIL
Course Category	:	PC

Course Content:

SUGGESTED PRACTICALS/ EXERCISES

The practical in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency.

S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. Required
1.	To study the different physical equipment used for networking		02*
2.	Study the different internetworking devices in a computer network		02*
3.	Study the working of basic networking commands		02*

S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. Required
4.	To study PC to PC communication using parallel port		02
5.	Study of LAN in Star Topology		02
6.	Study of LAN in Bus Topology		02
7.	Study of LAN in Tree Topology		02
8.	Study and configuration of modem of computer		02
9.	Study of wireless communication		02*
10.	Studying PC Communication using LAN		02
	Total		20

Reference Books:

S. No.	Title of Book	Author	Publication
1.	Basic Electrical Engineering	Mittle and Mittal	McGraw Education, New Delhi, 2015, ISBN : 978-0-07-0088572-5
2.	Basic Electrical Engineering	Ritu Sahdev	Khanna Publishing House, Delhi 2018, ISBN: 978-93-86173-49-2
3.	Fundamentals of Electrical Engineering	Saxena, S. B. Lal	Cambridge University Press, latest edition ISBN : 9781107464353
4.	Electrical Technology Vol – I	Theraja, B. L.	S. Chand publications, New Delhi, 2015, ISBN: 9788121924405
5.	Basic Electronics	S. Biswas	Khanna Publishing House, Delhi ISBN: 978-81-87522-164
6.	Electrical Technology Vol – II	Theraja, B. L.	S. Chand publications, New Delhi, 2015, ISBN: 9788121924375
7.	Basic Electrical and Electronics Engineering	Jegathesan, V.	Wiley India, New Delhi, 2015 ISBN : 97881236529513
8.	A text book of Applied Electronics	Sedha, R.S.	S.Chand ,New Delhi, 2008 ISBN-13: 978-8121927833
9.	Electronics Principles	Malvino, Albert Paul, David	McGraw Hill Education, New Delhi,2015, ISBN-13: 0070634244-978
10.	Principles of Electronics	Mehta, V.K. Mehta, Rohit	S. Chand and Company, New Delhi, 2014, ISBN-13-9788121924504
11.	Fundamental of Electronic Devices and Circuits	Bell Devid	Oxford University Press, New Delhi 2015 ISBN : 9780195425239

SUGGESTED SOFTWARE/LEARNING WEBSITES:

- a. en.wikipedia.org/wiki/Transformer
- b. www.animations.physics.unsw.edu.au/~jw/AC.html
- c. www.alpharubicon.com/altenergy/understandingAC.htm
- d. www.electronics-tutorials
- e. learn.sparkfun.com/tutorials/transistors
- f. www.pitt.edu/~qiw4/Academic/ME2082/Transistor%20Basics.pdf
- g. www.technologystudent.com/elec1/transis1.htm
- h. www.learningaboutelectronics.com
- i. www.electrical4u.com

Course Code	:	
Course Title	:	Artificial Intelligence
Number of Credits	:	3
Prerequisites (Course code)	:	None
Course Category	:	OE

Course Content:

Unit 1 – Introduction to Artificial Intelligence

- Artificial Intelligence (AI) definition
- Goals of AI
- History of AI
- Applications of AI

Unit 2 – Agents and Environments

- Agent Terminology, Types of Agents – Simple Reflex Agents, Model Based Reflex Agents, Goal Based Agents
- Nature of Environments, Properties of Environments

Unit 3 –

Search

Algorithms

Terminology

- Brute Force Search Strategies – Breadth First Search, Depth First Search.
- Heuristic Search Strategies, Local Search Algorithms.

Unit 4 – Fuzzy Logic Systems

Introduction to Fuzzy Logic and Fuzzy systems,

- Membership functions,
- Fuzzification/Defuzzification

Unit 5 – Neural Networks

Basic structure of Neural Networks

- Perceptron
- Back-propagation

Suggested Learning Resources:

S. No.	Title of Book	Author	Publication
1	Artificial Intelligence By Example: Develop machine intelligence from scratch using real artificial intelligence use cases	Denis Rothman	Packt Publishing ISBN – 978-1788990547

Course Code	:	PES-666
Course Title	:	Entrepreneurship and Start-ups
Number of Credits	:	4
Prerequisites (Course code)	:	None
Course Category	:	HS

Course Learning Objectives:

1. Acquiring Entrepreneurial spirit and resourcefulness.
2. Familiarization with various uses of human resource for earning dignified means of living.
3. Understanding the concept and process of entrepreneurship - its contribution and role in the growth and development of individual and the nation.
4. Acquiring entrepreneurial quality, competency, and motivation.
5. Learning the process and skills of creation and management of entrepreneurial venture.

Course Content:

Unit 1 - Introduction to Entrepreneurship and Start – Ups

- Definitions, Traits of an entrepreneur, Intrapreneurship, Motivation
- Types of Business Structures, Similarities/differences between entrepreneurs and managers.

Unit 2 – Business Ideas and their implementation

- Discovering ideas and visualizing the business
- Activity map
- Business Plan

Unit 3 – Idea to Start-up

- Market Analysis – Identifying the target market,
- Competition evaluation and Strategy Development,
- Marketing and accounting,
- Risk analysis

Unit 4 – Management

- Company's Organization Structure,
- Recruitment and management of talent.
- Financial organization and management

Unit 5 - Financing and Protection of Ideas

- Financing methods available for start-ups in India
- Communication of Ideas to potential investors – Investor Pitch
- Patenting and Licenses

Unit 6: Exit strategies for entrepreneurs, bankruptcy, and succession and harvesting strategy

Learning Outcome:

Upon completion of the course, the student will be able to demonstrate knowledge of the following topics:

1. Understanding the dynamic role of entrepreneurship and small businesses
2. Organizing and Managing a Small Business
3. Financial Planning and Control
4. Forms of Ownership for Small Business
5. Strategic Marketing Planning
6. New Product or Service Development
7. Business Plan Creation

SUGGESTED LEARNING RESOURCES:

S. No.	Title of Book	Author	Publication
1.	The Startup Owner’s Manual: The Step-by-Step Guide for Building a Great Company	Steve Blank and Bob Dorf	K & S Ranch ISBN – 978-0984999392
2.	The Lean Startup: How Today’s Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses	Eric Ries	Penguin UK ISBN – 978-0670921607
3.	Demand: Creating What People Love Before They Know They Want It	Adrian J. Slywotzky with Karl Weber	Headline Book Publishing ISBN – 978-0755388974
4.	The Innovator’s Dilemma: The Revolutionary Book That Will Change the Way You Do Business	Clayton M. Christensen	Harvard business ISBN: 978-142219602

SUGGESTED SOFTWARE/LEARNING WEBSITES:

- a. <https://www.fundable.com/learn/resources/guides/startup>
- b. <https://corporatefinanceinstitute.com/resources/knowledge/finance/corporate-structure/>
- c. <https://www.finder.com/small-business-finance-tips>
- d. <https://www.profitbooks.net/funding-options-to-raise-startup-capital-for-your-business/>

Course Code	:	AUD-111
Course Title	:	Indian Constitution
Number of Credits	:	0 (L: 2, T:0; P:0)
Prerequisites (Course code)	:	None
Course Category	:	AU

Course Content

Unit 1 – The Constitution - Introduction

- The History of the Making of the Indian Constitution
- Preamble and the Basic Structure, and its interpretation
- Fundamental Rights and Duties and their interpretation
- State Policy Principles

Unit 2 – Union Government

- Structure of the Indian Union
- President – Role and Power
- Prime Minister and Council of Ministers
- Lok Sabha and Rajya Sabha

Unit 3 – State Government

- Governor – Role and Power
- Chief Minister and Council of Ministers
- State Secretariat

Unit 4 – Local Administration

- District Administration
- Municipal Corporation
- Zila Panchayat

Unit 5 – Election Commission

- Role and Functioning
- Chief Election Commissioner
- State Election Commission

Suggested Learning Resources:

S. No.	Title of Book	Author	Publication
1.	Ethics and Politics of the Indian Constitution	Rajeev Bhargava	Oxford University Press, New Delhi, 2008
2.	The Constitution of India	B.L. Fadia	Sahitya Bhawan; New edition (2017)
3.	Introduction to the Constitution of India	DD Basu	Lexis Nexis; Twenty-Third 2018 edition

Suggested Software/Learning Websites:

- <https://www.constitution.org/cons/india/const.html>
- <http://www.legislative.gov.in/constitution-of-india>
- <https://www.sci.gov.in/constitution>
- <https://www.toppr.com/guides/civics/the-indian-constitution/the-constitution-of-india/>