

SHRI VENKATESHWARA UNIVERSITY



**Syllabus
Diploma**

(Computer Science)

V SEMESTER

(Three Years Programme)

(w.e.f. 2019-20)

**SCHOOL OF ENGINEERING &
TECHNOLOGY**

Computer Science
V SEMESTE

Sl No.	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	PCS - 501	Mobile Computing	3	0	0	20	10	30		70		100	3
2	PCS-502	Information Security	3	0	0	20	10	30		70		100	3
3	PCS-503	Internet of Things	2	1	0	20	10	30		70		100	3
4	PCS -504	Introduction to e-Governance	2	1	0	20	10	30		70		100	3
5	POE - 051	Operations Research	3	0	0	20	10	30		70		100	3
6	PCS-511	Mobile Computing Lab	0	0	2				10		15	25	1
7	PCS - 512	Information Security Lab	0	0	2				10		15	25	1
8	PCS -513	Summer Intern-ship-II	0	0	0				50			50	3
9	PCS-514	Project Phase-I	0	0	4				50		50	100	2
												700	22
<i>Summer Internship-II (6 weeks) after IVth Sem</i>													

Course Code	:	PCS-501
Course Title	:	Mobile Computing
Number of Credits	:	4 (L: 3, T: 0, P: 2)
Prerequisites	:	COPC203, COPC204, COPC208
Course Category	:	PE

Course Learning Objectives:

To teaches how to build mobile apps for Android. Students are expected to work on a project as part of the course.

Course Content:

UNIT 1:

A brief history of Mobile, Types of mobile phone generations, The Mobile Ecosystem, Types of Mobile

Applications, Mobile Information Architecture Android Versions, Features of Android, Android Architecture, Installing Android SDK Tools, Configuring Android in Eclipse IDE, Android Development Tools (ADT), Creating Android Virtual Devices (AVD)

UNIT 2:

Creating first android application, Anatomy of android application, Deploying Android app on USB connected Android device, Android application components, Activity life cycle, Understanding activities, Exploring Intent objects, Intent Types, Linking activities using intents

UNIT 3:

Fragments life cycle, Interaction between fragments, Understanding the components of a screen (Layouts), Adapting to display orientation, Action Bar, Views(UI Widgets)-Button, Toast, ToggleButton, CheckBox, RadioButton, Spinner, WebView, EditText, DatePicker, TimePicker, ListView, ProgressBar, Analog and Digital clock, Handling UI events, List fragment, Dialog fragment

UNIT 4:

Menus-Option, Context, Popup, Images-ImageView, ImageSwitcher, AlertDialog, Alarm manager, SMS, E-mail, Media Player, Using camera, recording video, Handling Telephony Manager

UNIT 5:

Storing the data persistently-Data Storage Options: preferences, Internal Storage, External Storage, Content Provider, The SQLite database, Connecting with SQLite database and operations-Insert, Delete, Update, Fetch, Publishing android applications, Deploying APK files

Suggested Lab Work:

This is a skill course. Topics/tools taught in the class should be practiced in the Lab same week and practiced regularly during the semester till student becomes confident about it. Students should explore features of various tools/technologies introduced during the course and become comfortable with their use. Teacher should give weekly practice tasks as assignment. Learnings from this course should be used in the project/software built.

Reference Books:

1. Wei-Meng Lee, Beginning Android 4 Application Development, Wiley Publishing, Inc.
2. Pradeep Kothari, “Android Application Development Black Book”, DreamTech Press
3. James C. Sheusi, “Android Application Development for Java Programmers”, Cengage Learning
4. Mark L Murphy, “Beginning Android”, Wiley India Pvt Ltd
5. Sayed Y Hashimi and Satya Komatineni(2009), “Pro Android”, Wiley India Pvt Ltd
6. Reto Meier, Professional Android 4 Application Development, Wiley India Pvt Ltd

Course outcomes:

Will be able to develop and deploy basic mobile applications.

Course Code	:	PCS-502
Course Title	:	Information Security
Number of Credits	:	4 (L: 3, T: 0, P: 2)
Prerequisites	:	COPC102
Course Category	:	PE

Course Learning Objectives:

To learn how to evaluate and enhance information security of IT infrastructure and organisations

Course Content:

UNIT 1:

Introduction to Information Security, Various aspects of information security (PAIN), Security Features of Operating Systems – Authentication, Logs, Audit Features, File System Protection, User Privileges, RAID options, Anti-Virus Software, etc.

UNIT 2:

Understanding security weaknesses in popular networking protocols – IP, TCP, UDP, RIP, OSPF, HTTP, SMTP, etc.; security weaknesses in common networking devices – Hub, switch, router, WiFi; Security solutions to mitigate security risk of networking protocols (IPSec, HTTPS, etc) and devices (VLAN, VPN, Ingress Filtering, etc)

UNIT 3:

Basics of Cryptography, PKI, Security considerations while developing softwares

UNIT 4:

Network Security Products – Firewall, IDS/IPS, VPN Concentrator, Content Screening Gateways, etc.

UNIT 5:

Introduction to Security Standards – ISO 27001, Indian IT Act, IPR Laws; Security Audit procedures; Developing Security Policies; Disaster Recovery, Business Continuity Planning

Reference Books:

1. Information Security and Cyber Laws, Sarika Gupta, Khanna Publishing House
2. RFCs of protocols listed in content (<https://www.ietf.org>)
3. Various Acts, Laws and Standards (IT Act, ISO27001 Standard, IPR and Copyright Laws, etc.)
4. Security Guideline documents of Operating Systems (OS Manual, Man Pages, etc)
5. <https://www.cert-in.org.in/>
6. <https://www.sans.org/>

Course outcomes:

Understanding of security needs and issues of IT infrastructure. Have basic skills on security audit of networks, operating systems and application software.

Course Code	:	PCS-503
Course Title	:	Internet of Things
Number of Credits	:	3 (L: 2, T: 1, P: 0)
Prerequisites	:	-----
Course Category	:	PC

Course Learning Objectives:

Internet of Things (IoT) is presently an important technology with wide ranging interest from Government, academia and industry. IoT cuts across different application domain verticals ranging from civilian to defence sectors which includes agriculture, space, health care, manufacturing, construction, water, mining, etc. Today it is possible to build different IoT solutions such as shopping system, infrastructure management in both urban

and rural areas, remote health monitoring and emergency notification systems, and transportation systems. Therefore, it is very important to learn the fundamentals of this emerging technology.

Course Content:

UNIT 1:

Introduction to IoT; Sensing; Actuation

UNIT 2 :

Basics of IoT Networking, Communication Protocols, Sensor networks

UNIT 3:

Introduction to Arduino programming, Integration of Sensors/Actuators to Arduino

UNIT 4:

Implementation of IoT with Raspberry Pi; Data Handling Analytics

UNIT 5:

Case Studies: Agriculture, Healthcare, Activity Monitoring

Reference Books:

1. https://nptel.ac.in/noc/individual_course.php?id=noc17-cs22
2. “The Internet of Things: Enabling Technologies, Platforms, and Use Cases”, by Pethuru Raj and Anupama C. Raman (CRC Press)
3. Internet of Things by Dr. Jeeva Jose, Khanna Publishing House (Edition 2017)
4. “Internet of Things: A Hands-on Approach”, by Arshdeep Bahga and Vijay Madisetti (Universities Press)
5. *Internet of Things: Architecture and Design Principles*, Raj Kamal, McGraw Hill
6. Research papers

Course outcomes:

Students will have good understanding of various aspect of IoT, know some tools and have basic implementation skills.

Course Code	:	PCS-504
Course Title	:	Introduction to e-Governance
Number of Credits	:	3 (L: 2, T: 1, P: 0)
Prerequisites	:	-----
Course Category	:	PC

Course Learning Objectives:

To cover the concepts of e-Governance and to understand how technologies and business models shape the contours of government for improving citizen services and bringing in transparency.

Course Content:

UNIT 1:

Exposure to emerging trends in ICT for development; Understanding of design and implementation of e-Government projects, e-governance lifecycle.

UNIT 2:

Need for Government Process Re-engineering (GPR); National e-Governance Plan(NeGP) for India; SMART Governments & Thumb Rules

UNIT 3:

Architecture and models of e-Governance, including Public Private Partnership (PPP); Need for Innovation and Change Management in eGovernance; Critical Success Factors; Major issue including corruption,

resistance for change, e-Security and Cyber laws

UNIT 4:

Focusing on Indian initiatives and their impact on citizens; Sharing of case studies to highlight best practices in managing e-Governance projects in Indian context. Visits to local e-governance sites (CSC, eSeva, Post Office, Passport Seva Kendra, etc) as part of Tutorials.

UNIT 5:

Mini Projects by students in groups – primarily evaluation of various e-governance projects.

Reference Books:

1. Managing Transformation –Objectives to Outcomes. J Satyanarayana, Prentice Hall India
2. The State, IT and Development. Kenneth Kenniston, RK Bagga and Rohit Raj Mathur, Sage Publications India Pvt Ltd.
3. e-Government -The Science of the Possible. J Satyanarayana, Prentice Hall, India
4. <http://www.csi-sigegov.org/publications.php>
5. <https://negd.gov.in>
6. <https://www.nisg.org/case-studies-on-e-governance-in-india>

Course outcomes:

Through exposure to introductory ideas and practices followed in a selected number of e-Governance initiatives in India, the course will help students to understand and appreciate the essence of e-Governance.

Course Code	:	POE-051
Course Title	:	OPERATIONS RESEARCH
Number of Credits	:	3 (L: 3, T: 0, P: 0)
Prerequisites	:	NIL
Course Category	:	PE

Course Learning Objectives:

- To provide a broad and in depth knowledge of a range of operation research models and techniques, which can be applied to a variety of industrial applications.

Course Content:

UNIT-I: Development, Definition, Characteristics and phase of Scientific Method, Types of models; General methods for solving operations research models.

UNIT-II: Allocation: Introduction to linear programming formulation, graphical solution, Simplex Method, artificial variable technique, Duality principle. Sensitivity analysis.

UNIT-III: Transportation Problem Formulation optimal solution. Unbalanced transportation problems, Degeneracy. Assignment problem, Formulation optimal solution.

UNIT-IV: Sequencing: Introduction, Terminology, notations and assumptions, problems with n-jobs and two machines, optimal sequence algorithm, problems with n-jobs and three machines.

UNIT-V: Theory of games: introduction, Two-person zero-sum games, The Maximum –Minimax principle, Games without saddle points – Mixed Strategies, 2 x n and m x 2 Games – Graphical solutions, Dominance property, Use of L.P. to games.

Reference Books:

1. Operations Research: an introduction, Hamdy A. Taha, Pearson Education.
2. Operations. Research: theory and application, J.K. Sharma, Macmillan Publishers.
3. Introduction to Operations Research: concept and cases, Frederick S. Hillier and Gerald J. Lieberman, Tata McGraw-Hill

Course outcomes:

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

CO1	Understand the formulation of Linear Programming
CO2	Analyze and Convert the problem into a mathematical model.
CO3	Understand and implement the transportation problems at workplace
CO4	Understand sequencing to optimize the process time for n- job and m-machine
CO5	Identify and select suitable methods for various games and apply the LP