



SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
(Accredited by NBA-AICTE, New Delhi & Accredited by NAAC with "A" Grade)
Madagadipet, Puducherry - 605 107



SCHOOL OF ARTS AND SCIENCE

Department of Computational Studies

Bachelor of Computer Science

Minutes of 5th meeting of Board of Studies

Venue

Department of Computational Studies
First Floor, SAS Block

Date & Time

20-09-2022 & 10.00 am to 12.00pm



SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
(Accredited by NBA-AICTE, New Delhi & Accredited by NAAC with "A" Grade)
Madagadipet, Puducherry - 605 107



School of Arts and Science Department of Computational Studies Minutes of Board of Studies Meeting for B.Sc. CS

The Fifth meeting of Board of Studies for the course B.Sc. Computer Science was held through online on 20.09.2022 at 10.00 am in the Department of Computational Studies, School of Arts and Science, Sri Manakula Vinayagar Engineering College with the Head of the Department in the Chair.

The following members were present for the Fifth Meeting of Board of Studies.

Sl. No.	Name of the Member	Designation
Head of the Department (Chairman)		
1	Mr. S. VISU, MCA., M.Phil., Assistant Professor and Head, Department of Computational Studies, School of Arts and Science, Sri Manakula Vinayagar Engineering College, Madagadipet, Puducherry. 605 107. E-mail: visucs@smvec.ac.in Mobile: 9791966297	Chairman
External Expert Members		
2	Dr. R. RAMKUMAR, MCA, M.Phil., M.Tech., Ph.D., Associate Prof. and Head, School of Computer Science, VET Institute of Arts and Science , Thindal , Erode. email:ramkumar2006@gmail.com Mobile: 9600966086	Pondicherry University Nominee
3	Dr. V. J. CHAKRAVARTHY, MCA,M.Sc., M.Phil.,Ph.D. Principal , Arulmigu Kapaleeswarar Arts and Science College, Kolathur , Chennai – 99. Email:chakkucksm1808@gmail.com Mobile: 9884161687	Subject Expert (Academic Council Nominee)
4	Dr. S. MANJU PRIYA, M.Sc.,M.Phil.,Ph.D., SET, Professor, Department of Computer Science, Karpaga Academy of Higher Education, Coimbatore. Email:smanjujr@gmail.com Mobile: 9600553725	Subject Expert (Academic Council Nominee)

5	Mr. C. VIMAL RAJ, B.Tech., Systems Architect, TCS, Chennai. Email:vimal06vishwa@gmail.com Mobile: 9952578333	Member (Industry representative)
Internal Members		
6	Dr. A. ANTHONY PAUL RAJ M.Sc., B.Ed., M.Phil., Ph.D. Assistant Professor, Specialization: Network Security & Data Science Years of Experience: 15 years Sri Manakula Vinayagar Engineering College E-mail: anthonypaulrajsas@smvec.ac.in Mobile: 9942531512	Member
7	Mrs. S. DIVYA, M.C.A., Assistant Professor, Specialization: RDBMS Years of Experience: 5 years Sri Manakula Vinayagar Engineering College E-mail: divyacs.sas@smvec.ac.in Mobile: 9791456258	Member
8	Mr. N. VELAN, M.C.A., Assistant Professor, Specialization: Computer Network Years of Experience: 6 Months Sri Manakula Vinayagar Engineering College E-mail: velancs.sas@smvec.ac.in Mobile: 8344577751	Member
9	Mrs. A. SHAMSATH BEGUM, M.C.A., Assistant Professor, Specialization: Networking Years of Experience: 1 Month Sri Manakula Vinayagar Engineering College E-mail: shamsathbegum.sas@smvec.ac.in Mobile: 9500399774	Member
Co-opted Members		
10	Dr. M.A. ISHRATH JAHAN M.A., M.Phil., Ph.D., Associate Professor & Head, Dept. of English, SMVEC	Member
11	Mrs. R. RAJESWARI M.A., NET., Assistant Professor & Head, Dept. of Media Studies, SMVEC	Member

Agenda of the Meeting

Agenda	Description
BoS/U.G/ B.Sc Computer Science 5.1	Welcome Address, Introduction about the Institution, Department and BoS Members
5.2	Confirmation of minutes of the Fourth meeting of the Board of Studies. The Head of the Department appraised the Board regarding the Minutes of the Fourth Meeting of BoS
5.3	To discuss and approve the improvisations in the Curriculum Structure of the Bachelor of Computer Science Programme from the AY 2021-22
5.4	To discuss the modifications in the Syllabi for the Third Year courses under R-2020 regulations for the B.Sc. Computer Science students admitted in the Year 2020-2021 and in the 2021-22
5.5	To consider any other item with the permission of the Chair

Minutes of the Meeting

Item No.: BOS/2022/SAS/UG/CP/5.1

Mr.S.Visu, Chairman, welcomed all the external and internal members. The meeting thereafter deliberated on agenda items that had been approved by the Chairman.

Item No.: BOS/2022/SAS/UG/CP/5.2

Chairman, BoS, appraised the minutes of Fourth meeting of BoS and its implementation and then it was confirmed with the approval of BoS Board members.

Item No.: BOS/2022/SAS/UG/CP/5.3

The Curriculum was discussed and the Board of Members were recommended the following improvisations.

Sl.No.	Regulation	Semester	Course Title with Course Code	Unit No.	Particulars
1	R 2020	V	NPTEL/SWAYAM – A20CPM501	The whole Course	<ul style="list-style-type: none"> The Board Members were suggested to adding online course in semester V.
2	R 2020	VI	.NET Technology Lab – A20CPL610	The whole Course	<ul style="list-style-type: none"> The Board Members has suggested to adding Lab course in semester VI. We have added the lab course according with core theory.
3	R 2020	V & VI	Employability Enhancement Course – A20CPC505/ A20CPC606	The whole Course	<ul style="list-style-type: none"> The Employability Enhancement Course has withdrawn in Semester V & VI. We have a plan to concentrate the Placement Training instead of Employability Enhancement Course.
4	R 2020	VI	Animation and Visual Effects– A20CPE611	The whole Course	<ul style="list-style-type: none"> The Board Members has suggested to introducing a course Animation and Visual Effects instead of Data Visualization using MATLAB.

The above changes made and are given in Annexure I.

Item No.: BOS/2021/SAS/UG/CP/5.4

The Syllabus was discussed and the Board of Members was recommended the following improvisations.

Sl.No.	Regulation	Semester	Course Title with Course Code	Unit No.	Particulars
1	R 2020	V	Network Technologies – A20CPT510	Unit 5	<ul style="list-style-type: none"> The Board members were suggested to reduce the more contents in Unit 5.
2	R 2020	V	Intrusion Detection System and Prevention - A20CPE508	Unit 2 & 3	<ul style="list-style-type: none"> The Board members were suggested to reduce the additional contents in Unit 2 and Unit 3.
3	R 2020	V	System Software - A20CPE509	Unit 1	<ul style="list-style-type: none"> The Board members were suggested to add basic introduction in Unit 1 and we have added the contents.
4	R 2020	V	Python and Network Lab - A20CPL509	The whole Course	<ul style="list-style-type: none"> The Board members were suggested to segregate the list of exercises.
5	R 2020	VI	Data Visualization - A20CPE611	The whole Course	<ul style="list-style-type: none"> The Board members were suggested to ignore the MATLAB in syllabus.




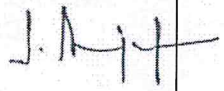
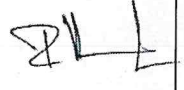



6	R 2020	VI	Ethical Hacking - A20CPE612	Unit 5	<ul style="list-style-type: none"> The Board members were suggested to reduce the more contents in Unit 5.
7	R 2020	VI	.NET Technology Lab - A20CPL610	The whole Course	<ul style="list-style-type: none"> The Board Members has suggested to adding Lab course in semester VI. We have added the lab course according with core theory.
8	R 2020	VI	Animation and Visual Effects- A20CPE611	The whole Course	<ul style="list-style-type: none"> The Board Members has suggested to introducing a course Animation and Visual Effects instead of Data Visualization using MATLAB.


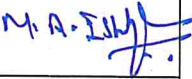
The above corrections have been made in the Syllabus and the details are given in Annexure- II .

Item No.: BOS/2021/SAS/UG/CP/5.5

Sl.No.	Regulation	Semester	Course Title with Course Code	Unit No.	Particulars
1	R 2020	III	DSE Courses	Nil	The Board members have appreciated for the preparation of Discipline Specific Elective Papers.

The above curriculum is given in Annexure III.

S. No.	Name of the Member with Designation and official Address	Responsibility in the BoS	Signature
1	Mr. S. VISU, MCA., M.Phil., Assistant Professor and Head, Department of Computational Studies, School of Arts and Science, Sri Manakula Vinayagar Engineering College, Madagadipet, Puducherry. 605 107. E-mail: visucs@smvec.ac.in Mobile: 9791966297	Chairman	
2	Dr. R. RAMKUMAR, MCA, M.Phil., M.Tech., Ph.D., Associate Prof. and Head, School of Computer Science, VET Institute of Arts and Science , Thindal , Erode. email:ramkumar2006@gmail.com Mobile: 9600966086	University Nominee	
3	Dr. V. J. CHAKRAVARTHY, MCA, M.Sc., M.Phil., Ph.D. Principal , Arulmigu Kapaleeswarar Arts and Science College, Kolathur , Chennai – 99. Email:chakkucksm1808@gmail.com Mobile: 9884161687	Subject Board (Academic Council Nominee)	
4	Dr. S. MANJU PRIYA, M.Sc., M.Phil., Ph.D., SET, Professor, Department of Computer Science, Karpaga Academy of Higher Education, Coimbatore. Email:smanjupr@gmail.com Mobile: 9600553725	Subject Board (Academic Council Nominee)	
5	Mr. C. VIMAL RAJ, B.Tech., Systems Architect, TCS, Chennai. Email:vimal06vishwa@gmail.com Mobile: 9952578333	Industry Board	
6	Dr. A. ANTHONY PAUL RAJ M.Sc., B.Ed., M.Phil., Ph.D. Assistant Professor, Specialization: Network Security & Data Science Years of Experience: 15 years Sri Manakula Vinayagar Engineering College E-mail: anthony paulrajsas@smvec.ac.in Mobile: 9942531512	Internal member	
7	Mrs. S. DIVYA, M.C.A., Assistant Professor, Specialization: RDBMS Years of Experience: 5 years Sri Manakula Vinayagar Engineering College E-mail: divyaacs.sas@smvec.ac.in Mobile: 9791456258	Internal member	
8	Mr. N. VELAN, M.C.A., Assistant Professor, Specialization: Computer Network Years of Experience: 6 Months Sri Manakula Vinayagar Engineering College E-mail: velancs.sas@smvec.ac.in Mobile: 8344577751	Internal member	

9	Mrs. A. SHAMSATH BEGUM, M.C.A., Assistant Professor, Specialization: Networking Years of Experience: 1 Month Sri Manakula Vinayagar Engineering College E-mail: shamsathbegum.sas@smvec.ac.in Mobile: 9500399774	Internal member	
Co-opted Members			
10	Dr. M.A. ISHRATH JAHAN M.A., M.Phil., Ph.D., Associate Professor & Head, Dept. of English, SMVEC	Internal member	
11	Mrs. R. RAJESWARI M.A., NET., Assistant Professor & Head, Dept. of Media Studies, SMVEC	Internal member	

The meeting was concluded at 12:00 pm with vote of thanks by **Mr. S. Visu**, Head of the Department, Department of Computational Studies.



Mr. S.Visu,

**HOD / Dept. of Computational Studies,
Chairman-BoS (B.Sc.CS)**



**Dean SAS
[Dr. S. Muthulakshmi]**



SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
(Accredited by NBA-AICTE, New Delhi & Accredited by NAAC with "A" Grade)
Madagadipet, Puducherry - 605 107



SCHOOL OF ARTS AND SCIENCE

Department of Computational Studies
Bachelor of Computer Science

Minutes of 5th meeting of Board of Studies

ANNEXURE - I

2.E.10.9

Annexure I

SEMESTER – V										
S. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20CPT510	Python Programming	DSC	3	1	0	4	25	75	100
2	A20CPT511	Network Technologies	DSC	3	1	0	4	25	75	100
3	A20CPT512	Artificial Intelligence	DSC	3	1	0	4	25	75	100
4	A20CPE5XX	Discipline Specific Elective-III	DSE	3	0	0	3	25	75	100
Practical										
5	A20CPL509	Python and Network Programming Lab	DSC	0	0	4	2	50	50	100
6	A20CPP501	Mini Project (C#/JAVA/PYTHON)	DSC	0	0	4	2	50	50	100
Skill Enhancement Course										
7	A20CMS514	Entrepreneurial Skills	SEC	0	0	4	2	100	0	100
Online Certification Course										
8	A20CPM501	NPTEL / SWAYAM	OCC	0	0	0	2	100	0	100
							23	400	400	800

SEMESTER – VI										
S. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20CPT613	.Net Technology	DSC	3	1	0	4	25	75	100
2	A20CPT614	Software Engineering	DSC	3	1	0	4	25	75	100
3	A20CPT615	Cloud Computing	DSC	3	1	0	4	25	75	100
4	A20CPE6XX	Discipline Specific Elective-IV	DSE	3	0	0	3	25	75	100
Practical										
5	A20CPL610	.Net Technology Lab	DSC	0	0	4	2	50	50	100
6	A20CPP602	Project Work & Viva-voce	DSC	0	0	10	5	40	60	100
Skill Enhancement Course										
7	A20CPS606	Research Methodology	SEC	0	0	4	2	100	0	100
							24	290	410	700

Discipline Specific Electives (DSE - IV) - offered in Sixth Semester

S. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
1	A20CPE610	Client Server Technology	DSE	3	0	0	3	25	75	100
2	A20CPE611	Animation and Visual Effects	DSE	3	0	0	3	25	75	100
3	A20CPE612	Ethical Hacking	DSE	3	0	0	3	25	75	100



SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
(Accredited by NBA-AICTE, New Delhi & Accredited by NAAC with "A" Grade)
Madagadipet, Puducherry - 605 107



SCHOOL OF ARTS AND SCIENCE

**Department of Computational Studies
Bachelor of Computer Science**

Minutes of 5th meeting of Board of Studies

ANNEXURE - II

Annexure II

A20CPT510	NETWORK TECHNOLOGIES	L	T	P	C	Hrs
		3	1	0	4	60

Course Objectives

- To understand the basic concepts of Data Communications.
- To understand the functionalities and components involved in the physical layer.
- To learn the basic concepts of data link layer services and network layer communication protocols
- To understand various load characteristics and network traffic conditions, decide the transport protocols to be used.
- To analyze and compare the different protocols available in the application layer.

Course Outcomes

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

CO1 - Analyze the network components and network standards.

CO2 - Determine the Physical layer functionalities, Transmission modes and media.

CO3 - Analyze the Error correction and detection techniques and determine the proper usage of IP address, subnet mask and default gateway in a routed network.

CO4 - Describe, analyze and compare different protocols in transport layer.

CO5 - Analyze the functional working of different protocols of application layer.

UNIT I DATA COMMUNICATIONS

(12Hrs)

Overview of Data Communications – Networks and its types – Network topologies. Transmission technologies: Signal Transmission – Digital signaling – Analog Signaling. Networks Models: Protocol Layering – OSI reference model – TCP/IP Protocol suite.

UNIT II PHYSICAL LAYER

(12Hrs)

Physical layer functionalities – Analog to digital conversion using PCM, Transmission Modes: Parellel–Serial. Transmission Media: Guided and unguided media. Switching: Introduction. Circuit Switching and Packet switching Networks.

UNIT III DATA LINK LAYER AND NETWORK LAYER

(14Hrs)

Data link layer services – Error Detection and Correction – Sliding window protocols – Network devices. Network layer functionality. Routing Algorithms: The Optimality Principle – Shortest path algorithm, Distance vector routing – Classful Addressing – Subnetting – Network layer protocols: IPV4, IPV6.

UNIT IV TRANSPORT LAYER

(12Hrs)

The Transport Services - Connection management – Transport layer Congestion Control – Transport Layer Protocols: User Datagram Protocol (UDP) – Transmission Control Protocol (TCP).

UNIT V WIRELESS TECHNOLOGIES

(10Hrs)

Wireless Technologies: Wi-fi, Bluetooth, Li-fi, Cellular Internet: 3G, 4G, 5G.

Text Books

1. Behrouz A. Forouzan, Data Communications and Networking, Fifth Edition TMH, 2013.
2. Tanenbaum, A.S. and David J. Wetherall "Computer Networks", 5th ed., Prentice Hall, 2011
3. James F. Kurose and Keith W. Ross, "Computer Networking: A Top-Down Approach: International Edition", Pearson Education, Sixth edition, 2013.

Reference Books

1. Larry L. Peterson and Bruce S. Davie, "Computer Networks- A system approach", 5th edition, Elsevier, 2012.
2. Stallings, W., "Data and Computer Communications", 10th Ed., Prentice Hall Int. Ed., 2013.
3. DayanandAmbawade, Deven Shah, "Advanced Compter Networks", Dreamtech Press, 1st edition, 2011.
4. Pallapamanvi V, "Data Communications and Computer Networks", PHI, 4th edition, 2014.
5. Andre S.Tanenbaum, "Computer Networks", Pearson Publication, 4th Edition, 2018.

Web References

1. <https://www.geeksforgeeks.org/last-minute-notes-computer-network/>
2. <https://lecturenotes.in>
3. <https://www.cse.iitk.ac.in/users/dheeraj/cs425/>
4. <https://nptel.ac.in/courses/106/105/106105183/>
5. <https://nptel.ac.in/courses/106/105/106105081/>

A20CPE508

**INTRUSION DETECTION SYSTEM AND
PREVENTION**

L	T	P	C	Hrs
3	0	0	3	45

Course Objectives

- To provide a solid foundation to the students in network security
- To provide a solid foundation to the students in intrusion detection and prevention.
- To enable the students to master the knowledge about intrusion detection and prevention in the context of real-life applications.
- To prepare the students for understanding and evaluating critically
- To prepare the students for understanding and assimilating new knowledge and emerging technology in network security

Course Outcomes

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

- CO1** - Understand the physical location, the operational characteristics and the various functions performed by the intrusion detection and prevention system.
- CO2** - Describe how components in different layers inter-operate in the intrusion detection and prevention system.
- CO3** - Learn new techniques and to align new security technologies to existing network infrastructure
- CO4** - Understand the current and effective architecture to deal with network security threats.
- CO5** - Apply intrusion detection alerts and logs to distinguish attack by using SNORT tool..

UNIT I INTRODUCTION

(9 Hrs)

History of Intrusion detection, Audit, Concept and definition , Internal and external threats to data, attacks, Need and types of IDS, Information sources Host based information sources, Network based information sources.

UNIT II INTRUSION DETECTION AND NETWORK TRAFFIC SIGNATURE

(9 Hrs)

Components of IDS, Steps of implementation and monitoring, Host- and network-based IDS, Implementing and evaluating IDS, intrusion detection versus intrusion prevention, Signature analysis, Detecting traffic signatures.

UNIT III INTRUSION DETECTION AND PREVENTION TECHNIQUES

(9 Hrs)

Host-based intrusion detection system (IDS)- Intrusion prevention system (IPS)- Network based IDS/IPS- Data collection for IDS/IPS- Intrusion detection techniques- misuse detection- pattern matching, rule-based and state-based.

UNIT IV IDS and IPS ARCHITECTURE

(9 Hrs)

Tiered architectures- single-tiered-multi-tiered- peer-to-peer- Sensor- sensor functions-sensor deployment and security- Agents-agent functions- agent deployment and security- Manager component- manager functions- manager deployment and security.

UNIT V IDP TOOLS

(9 Hrs)

Introduction to Snort, Snort Installation Scenarios, Installing Snort, Running Snort on Multiple Network Interfaces, Snort Command Line Options. Step-By-Step Procedure to Compile and Install Snort Location of Snort Files, Snort Modes Snort Alert Modes.

Text Books

1. Ali A. Ghorbani, Network intrusion detection and prevention concepts and techniques, Springer, 2010
2. C. Endorf, E. Schultz and J. Mellander, Intrusion Detection & Prevention, McGrawHill/Osborne, 2004.
3. Rafeeq Rehman : " Intrusion Detection with SNORT, Apache, MySQL, PHP and ACID," 1st Edition, Prentice Hall , 2003

Reference Books

1. Christopher Kruegel, Fredrik Valeur, Giovanni Vigna: "Intrusion Detection and Correlation Challenges and Solutions", 1st Edition, Springer, 2005.
2. Carl Endorf, Eugene Schultz and Jim Mellander " Intrusion Detection & Prevention", 1st Edition, Tata McGraw-Hill, 2004.
3. Stephen Northcutt, Judy Novak : "Network Intrusion Detection", 3rd Edition, New Riders Publishing, 2002

Web References

1. <https://opensourceforu.com/2017/04/best-open-source-network-intrusion-detectiontools/>
2. <https://security.berkeley.edu/intrusion-detection-guideline>
3. <https://www.snort.org/>

Course Objectives

- To understand the various concepts of system software.
- To gain about the Assembler.
- To learn about Macro and Macro processors
- To learn about Loaders
- To learn the Compilers.

Course Outcomes

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

CO1 - Learn about the various concepts of system software.

CO2 - Learn about various types of Assembler.

CO3 - Learn about Macros and Macro processor

CO4 - Analyze the working of loaders.

CO5 - Explore the working of compiler.

UNIT I INTRODUCTION**(9 Hrs)**

What is System Software – Features – Types of System Software – Operating System – Programming Language Translators – Device Drivers – Firmware Software – Utility Software.

UNIT II ASSEMBLER**(9 Hrs)**

Assemblers: Purpose-pass 1 and pass 2 of assembly with flow chart-symbol table-literal table-base table generation.

UNIT III MACROS**(9 Hrs)**

Macros: Concept-definition macro call-macro call with arguments conditional - nested macros.-Macro processor: Definition-generation of macro definition table macro name table argument list array-two pass-macro processors -simple two-pass algorithms.

UNIT IV LOADERS**(9 Hrs)**

Loaders: concept - General-loader scheme-four functions of a loader allocation-relocation-linking and loading as accomplished by absolute-relocating and direct-linking loader.

UNIT V COMPILER**(9 Hrs)**

Definition-lexical analysis-syntax analysis -interpretation-parse tree storage allocation-code generation-optimization-structure of compiler. Features of High level languages: PL/I language data types and structure storage allocation and scope of names accessing flexibility - functional modularity asynchronous operation.

Text Book

1. John J. Donovan , System programming
2. Leland L. Beck "System Software-Introduction to system program
3. Damdhare., Introduction to system software

Reference books

1. "System Software: An Introduction to Systems Programming" by Leland L Beck. ...
2. "System Software" by M Joseph.
3. "System Software: An Introduction to Systems Programming for VTU" by Leland L Beck. ...

Web references

1. https://www.tutorialspoint.com/basics_of_computers/basics_of_computers_software_concepts.html
2. <https://www.geeksforgeeks.org/introduction-of-assembler/>
3. <https://www.geeksforgeeks.org/macro-processor/>
4. http://www.tezu.ernet.in/~utpal/course_mat/ss_compil.html
5. <https://www.techopedia.com/definition/8104/loader>

A20CPL509

PYTHON AND NETWORK LAB

L	T	P	C	Hrs
0	0	4	2	30

Course Objectives

- To practice the fundamental programming methodologies in the Python programming language.
- To apply logical skills for problem solving using control structures and arrays.
- To implement, test and debug programs that use different data types, variables, strings, arrays, pointers and structures.
- To design basic networking styles and provides recursive solution to problems.
- To understand the miscellaneous aspects of networking.

Course Outcomes

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

CO1 – Apply and practice logical formulations to solve simple problems leading to specific applications.

CO2 – Develop python programs for simple applications making use of basic constructs, arrays and strings.

CO3 – Develop the networking programs using IP.

CO4 – Design the module for Client and Server.

CO5 – Construct the network specializations.

List of Exercises

Python

1. Finding Area of a Triangle, Rectangle and Square.
2. Checking whether a given number is Prime or not.
3. Implementation of User defined functions.
4. Various operations on List and Tuples.
5. Various operations on string and dictionary.
6. Various types of inheritance using python.

Network

7. Detect Network Changes with IP Address.
8. Log Management with Python and Network Monitoring with Cacti.
9. NetFlow and sFlow Based Monitoring.
10. Alerting and Email Notification using networking system.
11. Testing DHCP Server and Client.
12. Test Network Speed with Python.

Reference Books

1. Stallings, W., “Data and Computer Communications”, 10th Ed., Prentice Hall Int. Ed., 2013.
2. John V Guttag, “Introduction to Computation and Programming Using Python”, MIT Press, Revised and expanded Edition, 2013.

Web References

1. <https://pythonprogramming.net/introduction-learn-python-3-tutorials/>
2. <https://www2.mvcc.edu/users/faculty/jfiore/CP/labs/LaboratoryManualForComputerProgramming.pdf>
3. <https://www.codecademy.com/learn/learn-python>
4. <https://www.geeksforgeeks.org/last-minute-notes-computer-network/>
5. <https://lecturenotes.in>

A20CPE611

ANIMATION AND VISUAL EFFECTS

L	T	P	C	Hrs
3	0	0	3	45

Course Objectives

- Evaluate teaching and learning processes using assistive technology for students with disabilities.
- Describe and demonstrate how people with disabilities can benefit from working on multidisciplinary team.
- Describe and demonstrate the use of technology devices for people with disabilities.
- Identify and evaluate technologies that maximize the potential of people with disabilities.
- Describe and demonstrate the use of assistive technology performance areas that facilitate inclusion in academic learning and work settings.

Course Outcomes

After Completion of the course, the students will be able to

- CO1 - Develop technology-enabled assessment and evaluation strategies
- CO2 - Demonstrate knowledge, attitudes and skills of assessment professionals working on multidisciplinary team
- CO3 - Facilitate instruction in the new technology devices that emerge within digital / interactive learning environments
- CO4 - Implement curriculum methods and strategies that use technology activities to maximize student learning
- CO5 - Identify and apply emerging technologies in learning and working environments

UNIT I – VFX & ANIMATION

(9 Hrs)

VFX- Understanding VFX - Brief history of VFX - Need for visual effects – Future of visual effects – Pros & Cons of visual effects - Applications of VFX – Comparison between VFX and Animation **Animation-** History of animation – Applications of animation – Career in Animation – Pros & Cons of animation

UNIT II – LEARNING AFTER EFFECTS

(9 Hrs)

The Platform – Tools used – Plugins & Types – Imports & Exports - Masking – Object Duplication - Motion Tracking – Rotoscoping - Colour Play – Visual Effects - Render tab & Advance option – Exporting to Media Encoder

UNIT III – LEARNING PREMIERE PRO

(9 Hrs)

The Platform - Difference between After Effects & Premiere Pro – Effects & Presets tab – Audio Splitting & its work – LUTs & its Application – Working with Creative Curve – Render Tab & Advance Options.

UNIT IV - INTRODUCTION TO BLENDER & TOOLS

(9 Hrs)

Basics of Blender – Understanding Blender Interface & Tools – The Blender Scene - Project overview & character Design – Using other design methods

UNIT V - BLENDER WORKS

(9 Hrs)

Modeling & its tools in Blender –Character Modelling –Unwrapping, Paining & Shaders – Character Rigging & Animation – The Render Page – Lighting & Composition

Text Book

1. Learning Blender: A Hands-On Guide to Creating 3D Animated Characters By Oliver Villar

Reference Books

1. Adobe After Effects CC Classroom in a Book 2018 Release By Lisa Fridsma & Brie Gyncild
2. Adobe Premiere Pro CC Classroom in a Book 2018 Release By Maxim Jago

Web Resources

1. https://www.synchronorm.com/products/depence2/visualization/overview/?gclid=EA1aIQobChM1st_Z8Paw6gIVgXwrCh0sIwYXEAAAYAiAAEgK_2fD_BwE
2. <https://libguides.bournemouth.ac.uk/c.php?g=471655&p=4636056>

Course Objectives

- Investigate how to attack a computer system.
- Explore low tech hacking techniques Investigate web-based hacking.
- Explore wireless network hacking.
- Investigate Trojans and other attacks.
- Perform penetration testing.

Course Outcomes

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

CO1 - Identify and analyze the stages an ethical hacker requires to take in order to compromise a target system.

CO2 - Identify tools and techniques to carry out a penetration testing.

CO3 - Critically evaluates security techniques used to protect system and user data.

CO4 - Demonstrate systematic understanding of the concepts of security at the level of policy and strategy in a computer system.

CO5 - Develop a practical understanding of the current cyber security issues.

UNIT I INTRODUCTION**(9 Hrs)**

Ethical Hacking Introduction - Attack Scenarios - Emulating Cyber Attacks - Cyber Laws - Programming (C, Python, Assembly Language Basics, Computer Memory)

UNIT II SCOPE**(9 Hrs)**

Scope of Hacking - Red Team Operations - Purple Team Operation - Bug Bounty Programs

UNIT III EXPLOITATION**(9 Hrs)**

System Exploitation Basic System Exploits - Windows Exploits – Power shell Exploitation - Web Application Exploitation

UNIT IV MALWARE**(9 Hrs)**

Malware Analysis Study of Malware - Mobile Malware – Ransomware.

UNIT V ETHICAL HACKING MOTION**(9 Hrs)**

Putting Ethical Hacking in Motion- Social Engineering- Why Hackers Use Social Engineering- Understanding the Implications- Performing Social-Engineering Attacks.

Text Books

1. Allen Harper, Shon Harris, Jonathan Ness, Chris Eagle, Gideon Lenkey, and Terron Williams, "Gray Hat Hacking The Ethical Hacker's Handbook", McGraw-Hill, 5th Edition, 2018.
2. Kenneth C.Brancik "Insider Computer Fraud" Auerbach Publications Taylor & Francis Group– 2008.
3. Kimberly Graves, "Certified Ethical Hacker STUDY GUIDE", Wiley publication, 2010.

Reference Books

1. Sean-Philip Oriyano, "Hacker Techniques, Tools, and Incident Handling, Jones and Bartlett Learning LLC", 3rd Edition, 2018.
2. AnkitFadia, "The Unofficial Guide to Ethical Hacking", Premier Press, 2nd Edition 2006.
3. LakshayEshan, "Ethical Hacking A Beginners Guide to Learning the World of Ethical Hacking", Amazon Digital Services LLC - KDP Print US, 2018.
4. RafayBaloch, "Ethical Hacking and Penetration Testing Guide", CRC Press, 2017.
5. Adidas Wilson, "Hacking Essentials The Beginner's Guide To Ethical Hacking And Penetration Testing", Adidas Wilson, 2019.

Web References

1. <https://freedomhacker.net> › Internet Security.
2. <https://www.guru99.com/c-sharp-tutorial.html>.
3. <https://www.hackthissite.org/>
4. <https://www.eccouncil.org/programs/certified-ethical-hacker-ceh/>

A20CPL610

.NET TECHNOLOGY LAB

L	T	P	C	Hrs
3	0	0	2	30

Course Objectives

- To understand the fundamentals of developing modular application by using object oriented concepts.
- To utilize the C# and .NET framework to build distributed enterprise applications.
- To develop Console Application, Windows Application and Web Applications.
- To connect to multiple data sources and managing them effectively.
- To learn the product development.

Course Outcomes

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

CO1 - Learn about MS.NET framework developed by Microsoft.

CO2 - Develop and implement Applications with C#.

CO3 - Design the interface for application development.

CO4 - Understand the .NET framework and deployment in the .NET.

CO5 - Explore Assemblies and Deployment in .NET enterprise applications.

List of Experiments

1. Classes and objects
2. Inheritance
3. Operator Overloading
4. Threading
5. Events and delegates
6. Working with windows forms controls
7. Validating data
8. Creating custom dialog box
9. Designing an MDI application with menu
10. Retrieving data from a SQL database
11. Manipulating data in a connected environment
12. Manipulating data in a disconnected environment

Text Books

1. David Chappell, "Understanding .NET – A Tutorial and Analysis", Addison Wesley, 2015.
2. Herbert Schildt, "C# 3.0 The Complete Reference", McGraw-Hill Professional, Third Edition, 2015.
3. Keogh, "J2EE The Complete Reference", Tata McGraw-Hill, 2015.

Reference Books

1. Andrew Troelsen, Pro C# 5.0 and the .NET 4.5 Framework, Sixth edition, A Press, 2012.
2. Joh Skeet, C# in depth, Manning publications, Third Edition, 2014.
3. AdrewStellman and Jennifer Greene, Head First C#, Third Edition, O'Reilly, 2013.

Web Resources

1. <https://www.c-sharpcorner.com/csharp-tutorials>
2. <https://www.guru99.com/c-sharp-tutorial.html>
3. <https://www.sitesbay.com/csharp/index>
4. <https://www.sitesbay.com/interview/dot-net>



SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
(Accredited by NBA-AICTE, New Delhi & Accredited by NAAC with "A" Grade)
Madagadipet, Puducherry - 605 107



SCHOOL OF ARTS AND SCIENCE

**Department of Computational Studies
Bachelor of Computer Science**

Minutes of 5th meeting of Board of Studies

ANNEXURE - III

Annexure - III

DISCIPLINE SPECIFIC ELECTIVES										
S. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Discipline Specific Electives (DSE - I) - offered in Third Semester										
1	A20CPE301	Introduction to Data Science using Hadoop	DSE	3	0	0	3	25	75	100
2	A20CPE302	Computer Graphics	DSE	3	0	0	3	25	75	100
3	A20CPE303	Information Security	DSE	3	0	0	3	25	75	100
Discipline Specific Electives (DSE - II) - offered in Fourth Semester										
1	A20CPE404	Image Processing	DSE	3	0	0	3	25	75	100
2	A20CPE405	Computer hardware and Trouble Shooting	DSE	3	0	0	3	25	75	100
3	A20CPE406	Data Mining	DSE	3	0	0	3	25	75	100
Discipline Specific Electives (DSE - III) - offered in Fifth Semester										
1	A20CPE507	Data Science using R	DSE	3	0	0	3	25	75	100
2	A20CPE508	Intrusion Detection System and Prevention	DSE	3	0	0	3	25	75	100
3	A20CPE509	System Software	DSE	3	0	0	3	25	75	100
Discipline Specific Electives (DSE - IV) - offered in Sixth Semester										
1	A20CPE610	Client Server Technology	DSE	3	0	0	3	25	75	100
2	A20CPE611	Animation and Visual Effects	DSE	3	0	0	3	25	75	100
3	A20CPE612	Ethical Hacking	DSE	3	0	0	3	25	75	100



SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi and Affiliated to Pondicherry University)
(Accredited by NBA-AICTE, New Delhi and Accredited by NAAC with "A" Grade)
Madagadipet, Puducherry



SCHOOL OF ARTS AND SCIENCE

BACHELOR OF SCIENCE IN COMPUTER SCIENCE

ACADEMIC REGULATIONS 2020 (R-2020) CURRICULUM AND SYLLABI

COLLEGE VISION AND MISSION

Vision

To be globally recognized for excellence in quality education, innovation and research for the transformation of lives to serve the society.

Mission

M1: Quality Education:

To provide comprehensive academic system that amalgamates the cutting edge technologies with best practices.

M2: Research and Innovation:

To foster value based research and innovation in collaboration with industries and institutions globally for creating intellectuals with new avenues.

M3: Employability and Entrepreneurship:

To inculcate the employability and entrepreneurial skills through value and skill based training.

M4: Ethical Values:

To instill deep sense of human values by blending societal righteousness with academic professionalism for the growth of society.

DEPARTMENT OF COMPUTATIONAL STUDIES

VISION AND MISSION

Vision:

To come up with successfully as a high-quality human capital in Computer Science and related areas for the sustainable growth of the IT industry needs of the country.

Mission:

M1: Innovative Skills:

Ensuring deeper understanding of fundamentals and acquiring innovative skills within core areas of Computer Science.

M2: Motivated Graduates:

Producing highly skilled and motivated graduates with the ability of problem solving individually and in teams.

M3: Ethical Responsibilities:

Providing a deep awareness of our ethical responsibilities to our profession and to the society.

B.Sc. Computer Science

STRUCTURE FOR UNDERGRADUATE PROGRAMME

S. No	Course Category	Breakdown of Credits
1	Language Modern Indian Language (MIL)	6
2	English (ENG)	6
3	Discipline Specific Core Courses (DSC)	83
4	Discipline Specific Elective Courses (DSE)	12
5	Inter-Disciplinary Courses (IDC)	16
6	Skill Enhancement Courses (SEC)	12
7	Employability Enhancement Courses (EEC*)	-
8	Ability Enhancement Compulsory Courses (AECC)	4
9	Open Elective (OE)	4
10	Extension Activity (EA)	1
11	Online Course (OCC)	2
Total		146

SCHEME OF CREDIT DISTRIBUTION – SUMMARY

S. No	Course Category	Credits per Semester						Total Credits
		I	II	III	IV	V	VI	
1	Language Modern Indian Language (MIL)	3	3	-	-	-	-	6
2	English (ENG)	3	3	-	-	-	-	6
3	Discipline Specific Core Courses (DSC)	12	12	12	12	16	19	83
4	Discipline Specific Elective Courses (DSE)	-	-	3	3	3	3	12
5	Inter-Disciplinary Courses (IDC)	4	4	4	4	-	-	16
6	Skill Enhancement Courses (SEC)	2	2	2	2	2	2	12
7	Employability Enhancement Courses (EEC*)	-	-	-	-	-	-	-
8	Ability Enhancement Compulsory Courses (AECC)	2	2	-	-	-	-	4
9	Open Elective (OE)	-	-	2	2	-	-	4
10	Extension Activity (EA)	-	1	-	-	-	-	1
11	Online Course (OCC)	-	-	-	-	2	-	2
Total		26	27	23	23	23	24	146

* EEC will not be included for the computation of "Total of Credits" as well as "CGPA"

B.Sc. Computer Science



2. E. 10. 25

SEMESTER – I										
S. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20TAT101/ A20FRT101	Tamil - I / French – I	MIL	3	0	0	3	25	75	100
2	A20GET101	General English – I	ENG	3	0	0	3	25	75	100
3	A20CPT101	Problem Solving using C	DSC	4	0	0	4	25	75	100
4	A20CPT102	Digital Logic and Computer Organization	DSC	4	0	0	4	25	75	100
5	A20CPD101	Computational Mathematics	IDC	3	1	0	4	25	75	100
Ability Enhancement Compulsory Course										
6	A20AET101	Environmental Studies	AECC	2	0	0	2	100	0	100
Practical										
7	A20CPL101	Programming in C Lab	DSC	0	0	4	2	50	50	100
8	A20CPL102	Digital Lab	DSC	0	0	4	2	50	50	100
Skill Enhancement Course										
9	A20CPS101	Communication Skills Lab	SEC	0	0	4	2	100	0	100
Employment Enhancement Course										
10	A20CPC101	Web Programming	EEC	0	0	4	0	100	0	100
							26	525	475	1000

B.Sc. Computer Science



2.E.10.26

SEMESTER – II										
S. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20TAT202/ A20FRT202	Tamil - II / French – II	MIL	3	0	0	3	25	75	100
2	A20GET202	General English-II	ENG	3	0	0	3	25	75	100
3	A20CPT203	Programming in C++	DSC	4	0	0	4	25	75	100
4	A20CPT204	Data Structures and Algorithms	DSC	4	0	0	4	25	75	100
5	A20CPD202	Discrete Mathematics	IDC	3	1	0	4	25	75	100
Ability Enhancement Compulsory Course										
6	A20AET202	Public Administration	AECC	2	0	0	2	100	0	100
Practical										
7	A20CPL203	Programming in C++ Lab	DSC	0	0	4	2	50	50	100
8	A20CPL204	Data Structures Lab	DSC	0	0	4	2	50	50	100
Skill Enhancement Course										
9	A20CPS202	Quantitative Aptitude and Logical Reasoning	SEC	0	0	4	2	100	0	100
Extension Activities										
10	A20EAL201	National Service Scheme	EA	0	0	2	1	100	0	100
Employment Enhancement Course										
11	A20CPC202	AngularJS	EEC	0	0	4	0	100	0	100
							27	625	475	1100

SEMESTER – III										
S. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20CPT305	Problem Solving using Java	DSC	4	0	0	4	25	75	100
2	A20CPT306	Microprocessors and Assembly Language Programming	DSC	4	0	0	4	25	75	100
3	A20CPE3XX	Discipline Specific Elective – I	DSE	3	0	0	3	25	75	100
4	A20MAD307	Numerical Methods	IDC	3	1	0	4	25	75	100
5	A20XXO3XX	Open Elective – I	OE	2	0	0	2	25	75	100
Practical										
6	A20CPL305	Programming in Java Lab	DSC	0	0	4	2	50	50	100
7	A20CPL306	Microprocessors Lab	DSC	0	0	4	2	50	50	100
Skill Enhancement Course										
8	A20CPS303	Office Automation Tools	SEC	0	0	4	2	100	0	100
Employment Enhancement Course										
9	A20CPC303	Exploring Java	EEC	0	0	4	0	100	0	100
							23	425	475	900

SEMESTER – IV										
S. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20CPT407	Operating Systems	DSC	4	0	0	4	25	75	100
2	A20CPT408	Database Management Systems	DSC	4	0	0	4	25	75	100
3	A20CPD404	Distributed Computing	IDC	3	0	0	4	25	75	100
4	A20CPE4XX	Discipline Specific Elective- II	DSE	3	0	0	3	25	75	100
5	A20XXO4XX	Open Elective – II	OE	2	0	0	2	25	75	100
Practical										
6	A20CPL407	Operating Systems Lab	DSC	0	0	4	2	50	50	100
7	A20CPL408	DBMS Lab	DSC	0	0	4	2	50	50	100
Skill Enhancement Course										
8	A20CPS404	Android App Development	SEC	0	0	4	2	100	0	100
Employment Enhancement Course										
9	A20CPC404	Mobile Application Development	EEC	0	0	4	0	100	0	100
							23	425	475	900

SEMESTER – V										
S. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20CPT509	Python Programming	DSC	3	1	0	4	25	75	100
2	A20CPT510	Network Technologies	DSC	3	1	0	4	25	75	100
3	A20CPT511	Artificial Intelligence	DSC	3	1	0	4	25	75	100
4	A20CPE5XX	Discipline Specific Elective-III	DSE	3	0	0	3	25	75	100
Practical										
5	A20CPL509	Python and Network Lab	DSC	0	0	4	2	50	50	100
6	A20CPP501	Mini Project (C#/JAVA/PYTHON)	DSC	0	0	4	2	50	50	100
Skill Enhancement Course										
7	A20CMS314	Entrepreneurial Skills	SEC	0	0	4	2	100	0	100
Online Certification Course										
8	A20CPM501	NPTEL/SWAYAM	OCC	0	0	0	2	100	0	100
							23	400	400	800

SEMESTER – VI										
S. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20CPT612	.Net Technology	DSC	3	1	0	4	25	75	100
2	A20CPT613	Software Engineering	DSC	3	1	0	4	25	75	100
3	A20CPT614	Cloud Computing	DSC	3	1	0	4	25	75	100
4	A20CPE6XX	Discipline Specific Elective-IV	DSE	3	0	0	3	25	75	100
Practical										
5	A20CPL610	.Net Technology Lab	DSC	0	0	4	2	50	50	100
6	A20CPP602	Project Work & Viva-voce	DSC	0	0	10	5	40	60	100
Skill Enhancement Course										
7	A20CPS606	Research Methodology	SEC	0	0	4	2	100	0	100
							24	290	410	700

DISCIPLINE SPECIFIC ELECTIVES										
S. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Discipline Specific Electives (DSE - I) - offered in Third Semester										
1	A20CPE301	Introduction to Data Science using Hadoop	DSE	3	0	0	3	25	75	100
2	A20CPE302	Computer Graphics	DSE	3	0	0	3	25	75	100
3	A20CPE303	Information Security	DSE	3	0	0	3	25	75	100
Discipline Specific Electives (DSE - II) - offered in Fourth Semester										
1	A20CPE404	Image Processing	DSE	3	0	0	3	25	75	100
2	A20CPE405	Computer hardware and Trouble Shooting	DSE	3	0	0	3	25	75	100
3	A20CPE406	Data Mining	DSE	3	0	0	3	25	75	100
Discipline Specific Electives (DSE - III) - offered in Fifth Semester										
1	A20CPE507	Data Science using R	DSE	3	0	0	3	25	75	100
2	A20CPE508	Intrusion Detection System and Prevention	DSE	3	0	0	3	25	75	100
3	A20CPE509	System Software	DSE	3	0	0	3	25	75	100
Discipline Specific Electives (DSE - IV) - offered in Sixth Semester										
1	A20CPE610	Client Server Technology	DSE	3	0	0	3	25	75	100
2	A20CPE611	Animation and Visual Effects	DSE	3	0	0	3	25	75	100
3	A20CPE612	Ethical Hacking	DSE	3	0	0	3	25	75	100

Annexure – II
OPEN ELECTIVE COURSES
COMPLETE LIST OF OPEN ELECTIVES OFFERED BY ALL THE DEPARTMENTS

Sl. No	Course Code	Course Title	Offering Department
1	A20BTO301	Biotechnology for Human Welfare	Bioscience
2	A20BTO302	Food Processing	Bioscience
3	A20BTO303	Food Technology	Bioscience
4	A20CHO304	Food Analysis (Practical)	Chemistry
5	A20CHO305	Molecules of Life (Practical)	Chemistry
6	A20CHO306	Water Analysis (Practical)	Chemistry
7	A20CMO307	Fundamentals of Accounting and Finance	Commerce and Management
8	A20CMO308	Fundamentals of Management	Commerce and Management
9	A20CMO309	Fundamentals of Marketing	Commerce and Management
10	A20CPO310	Data Structures	Computational Studies
11	A20CPO311	Programming in C	Computational Studies
12	A20CPO312	Programming in Python	Computational Studies
13	A20ENO313	Conversational Skills	English
14	A20ENO314	Fine-tune your English	English
15	A20ENO315	Interpersonal Skills	English
16	A20MAO316	Mathematical Modelling	Mathematics
17	A20MAO317	Quantitative Aptitude - I	Mathematics
18	A20MAO318	Statistical Methods	Mathematics
19	A20VCO319	Event Management	Media Studies
20	A20VCO320	Graphic Design	Media Studies
21	A20VCO321	Role of social media	Media Studies
22	A20NDO322	Basic Food Groups	Food Science
23	A20NDO323	Life Style Management	Food Science
24	A20NDO324	Nutritive Value of Foods	Food Science
25	A20PHO325	Astrophysics	Physics
26	A20PHO326	Basic of Modern Communication System	Physics
27	A20PHO327	Bio-Physics	Physics
28	A20TMO328	அடிப்படைத்தமிழ்	Tamil
29	A20TMO329	வாழ்வியல் இலக்கணம்	Tamil
30	A20TMO330	புதுக்கவிதைப் பாடறை	Tamil

Sl. No.	Course Code	Course Title	Offering Department
1	A20BTO401	Herbal Technology	Bioscience
2	A20BTO402	Vermiculture	Bioscience
3	A20BTO403	Biotechnology for Society	Bioscience
4	A20CHO404	C++ Programming and its Application to Chemistry	Chemistry
5	A20CHO405	Computational Chemistry Practical	Chemistry
6	A20CHO406	Instrumental Methods of Analysis	Chemistry
7	A20CMO407	Essential Legal Awareness	Commerce and Management
8	A20CMO408	Essentials of Insurance	Commerce and Management
9	A20CMO409	Practical Banking	Commerce and Management
10	A20CPO410	Database Management Systems	Computational Studies
11	A20CPO411	Introduction to Data Science using Python	Computational Studies
12	A20CPO412	Web Development	Computational Studies
13	A20ENO413	Functional English	English
14	A20ENO414	English Next-India	English
15	A20ENO415	English for Competitive Exam	English
16	A20MAO416	Discrete mathematics	Mathematics
17	A20MAO417	Operations Research	Mathematics
18	A20MAO418	Quantitative Aptitude - II	Mathematics
19	A20VCO419	Basics of News Reporting	Media Studies
20	A20VCO420	Scripting for media	Media Studies
21	A20VCO421	Video Editing	Media Studies
22	A20NDO422	Food Labelling	Food Science
23	A20NDO423	Hygiene and Sanitation	Food Science
24	A20NDO424	Nutrition for Adolescent	Food Science
25	A20PHO425	Digital Electronics	Physics
26	A20PHO426	Geo-Physics	Physics
27	A20PHO427	Space Science	Physics
28	A20TMO428	சிறுகதைப் பயிற்சி	Tamil
29	A20TMO429	செய்தி வாசிப்பு பயிற்சி	Tamil
30	A20TMO430	நிகழ்த்துக்கலை	Tamil

Inter Disciplinary Course			
Course Code	Course Title	Offering Department	Permitted Departments
A20PD303	Computer Basics	Computer Science	Nutrition and Dietetics

A20CPT509**PYTHON PROGRAMMING**

L	T	P	C	Hrs
4	0	0	4	60

Course Objectives

- To acquire programming skill in core python.
- To learn the basic looping and functions.
- To learn how to design python program and applications.
- To acquire the basic packages.
- To develop the object oriented programming.

Course Outcomes

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

- CO1 – Define the structure and components of a python program.
 CO2 – Illustrate the concepts of Python decision statements.
 CO3 – Use list, tuple, Set and dictionary in python program.
 CO4 – Read / write data from/to files and structure a program using Exceptions and Modules.
 CO5 – Knowing the basic oops concepts.

UNIT I INTRODUCTION TO PYTHON PROGRAMMING LANGUAGE (12 Hrs)

Introduction to Python Language – Strengths and Weaknesses – IDLE – Operators – Data Types – Introduction List, Tuple, Set, Dictionary. String : Slicing, Basic operations on strings- Built in methods -

UNIT II DECISION MAKING, LOOPING & FUNCTIONS (12 Hrs)

Control Flow: Introduction – Control Flow and Syntax – Indenting – Relational Expressions – Logical Expressions – If Statement – If else – else if – Nested if. Loop: The while Loop– Nested while Loop – For Loop – Nested for Loop – Break and continue Functions: parameters – Return values – Local and global scope – Function composition – Recursion and lambda functions.

UNIT III LIST, TUPLE, SET, DICTIONARY AND ARRAYS (12 Hrs)

Lists: List operations – List slices – List methods – List loop – Mutability – Aliasing – Cloning lists – List parameters – Tuples: Tuple assignment – Tuple as return value – Advanced list processing – List comprehension – Sets – Dictionaries: Operations and methods – Arrays.

UNIT IV FILES, EXCEPTIONS, MODULES AND PACKAGES (12 Hrs)

Built In Functions. Files and Exception: Text Files – Reading and writing files – Format operator – Command line arguments – Errors and exceptions – Handling exceptions – Modules – Standard modules – Packages.

UNIT V OBJECT ORIENTED PROGRAMMING IN PYTHON (12 Hrs)

Classes and Objects – Constructors – Inheritance – Abstraction – Polymorphism – Encapsulations – Dynamic Binding.

Text Books

1. Martin C Brown, "Python The Complete Reference", McGraw-Hill Education, 4th Edition, 2018
2. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", Shroff/O'Reilly Publishers, 2nd edition, 2016(<http://greenteapress.com/wp/thinkpython/>).
3. ReemaThareja, "Python Programming Using Problem Solving Approach", ISBN:9780199480173, Oxford University Press, First edition, 2017.

Reference Books

1. Robert Sedgewick, "Kevin Wayne, Robert Dondero – Introduction to Programming in Python: An Inter-disciplinary Approach", Pearson India Education Services Pvt. 2016.
2. Timothy A. Budd, "Exploring Python", Mc-Graw Hill Education (India) Private Ltd., 2015.
3. Ben Stephenson, "The Python Workbook A Brief Introduction with Exercises and Solutions", Springer International Publishing, Switzerland 2014.

Web References

1. <https://www.learnpython.org/>
2. <https://pythonprogramming.net/introduction-learn-python-3-tutorials/>
3. <https://www.codecademy.com/learn/learn-python>
4. <https://nptel.ac.in/courses/106/106/106106182/>

5/1



A20CPT510	NETWORK TECHNOLOGIES	L	T	P	C	Hrs
		3	1	0	4	60

Course Objectives

- To understand the basic concepts of Data Communications.
- To understand the functionalities and components involved in the physical layer.
- To learn the basic concepts of data link layer services and network layer communication protocols
- To understand various load characteristics and network traffic conditions, decide the transport protocols to be used.
- To analyze and compare the different protocols available in the application layer.

Course Outcomes

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

CO1 - Analyze the network components and network standards.

CO2 - Determine the Physical layer functionalities, Transmission modes and media.

CO3 - Analyze the Error correction and detection techniques and determine the proper usage of IP address, subnet mask and default gateway in a routed network.

CO4 - Describe, analyze and compare different protocols in transport layer.

CO5 - Analyze the functional working of different protocols of application layer.

UNIT I DATA COMMUNICATIONS**(12Hrs)**

Overview of Data Communications – Networks and its types – Network topologies. Transmission technologies: Signal Transmission – Digital signaling – Analog Signaling. Networks Models: Protocol Layering – OSI reference model – TCP/IP Protocol suite.

UNIT II PHYSICAL LAYER**(12Hrs)**

Physical layer functionalities – Analog to digital conversion using PCM, Transmission Modes: Parallel–Serial. Transmission Media: Guided and unguided media. Switching: Introduction. Circuit Switching and Packet switching Networks.

UNIT III DATA LINK LAYER AND NETWORK LAYER**(14Hrs)**

Data link layer services – Error Detection and Correction – Sliding window protocols – Network devices. Network layer functionality. Routing Algorithms: The Optimality Principle – Shortest path algorithm, Distance vector routing – Classful Addressing – Subnetting – Network layer protocols: IPV4, IPV6.

UNIT IV TRANSPORT LAYER**(12Hrs)**

The Transport Services - Connection management – Transport layer Congestion Control – Transport Layer Protocols: User Datagram Protocol (UDP) – Transmission Control Protocol (TCP).

UNIT V WIRELESS TECHNOLOGIES**(10Hrs)**

Wireless Technologies: Wi-fi, Bluetooth, Li-fi, Cellular Internet: 3G, 4G, 5G.

Text Books

1. Behrouz A. Forouzan, Data Communications and Networking, Fifth Edition TMH, 2013.
2. Tanenbaum, A.S. and David J. Wetherall "Computer Networks", 5th ed., Prentice Hall, 2011
3. James F. Kurose and Keith W. Ross, "Computer Networking: A Top-Down Approach: International Edition", Pearson Education, Sixth edition, 2013.



Reference Books

1. Larry L. Peterson and Bruce S. Davie, "Computer Networks- A system approach", 5th edition, Elsevier, 2012.
2. Stallings, W., "Data and Computer Communications", 10th Ed., Prentice Hall Int. Ed., 2013.
3. Dayan and Ambawade, Devén Shah, "Advanced Compter Networks", Dreamtech Press, 1st edition, 2011.
4. Pallapamanvi V, "Data Communications and Computer Networks", PHI, 4th edition, 2014.
5. Andre S.Tanenbaum, "Computer Networks", Pearson Publication, 4th Edition, 2018.

Web References

1. <https://www.geeksforgeeks.org/last-minute-notes-computer-network/>
2. <https://lecturenotes.in>
3. <https://www.cse.iitk.ac.in/users/dheeraj/cs425/>
4. <https://nptel.ac.in/courses/106/105/106105183/>
5. <https://nptel.ac.in/courses/106/105/106105081/>

5/11



A20CPT511**ARTIFICIAL INTELLIGENCE**

L	T	P	C	Hrs
3	1	0	4	60

Course Objectives

- To understand the basic concepts of applications of AI.
- To understand the functionalities of predicate calculus.
- To learn the basic concepts of natural language processing
- To understand various developments of expert system.
- To analyze and compare the case studies.

Course Outcomes

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

- CO1** - Know about the applications of artificial intelligence.
CO2 - Determine the predicate calculus and knowledge based systems.
CO3 - Very good knowledge in NLP process.
CO4 - Describe the knowledge representation and expert systems.
CO5 - Analysis the case studies..

UNIT I INTRODUCTION**(12Hrs)**

Artificial Intelligence - definition-Underlying Assumption A.I. Technique space search Production systems- Control Strategies-Heuristic search Problem characteristics-Production system characteristics.

UNIT II PREDICATE CALCULUS**(12Hrs)**

Predicate calculus & Knowledge Representation: Predicate calculus - Answer extraction - knowledge based systems - knowledge processing, inference technique.

UNIT III SOFTWARE AGENTS**(12Hrs)**

Architecture for Intelligent Agents – Agent communication – Negotiation and Bargaining – Argumentation among Agents – Trust and Reputation in Multi-agent system

UNIT IV APPLICATIONS**(12Hrs)**

AI applications – Language Models – Information Retrieval- Information Extraction – Natural Language Processing - Machine Translation – Speech Recognition – Robot – Hardware – Perception – Planning – Moving

UNIT V EXPERT SYSTEMS**(12Hrs)**

Experts Systems Definition of Expert Systems Characteristics of an Expert Systems Architecture of Expert Systems role of expert system knowledge acquisition - advantages and limitation of expert system- example expert System: MYCIN.

Text Book

1. N. J. Nilsson, Artificial Intelligence – A New Synthesis, Morgan Kaufmann, 1998.
2. Artificial Intelligence - Elaine Rich, Kevin Knight, Shivasankar B.Nair-Third edition- McGraw Hill- 2017
3. Stuart Russel, Peter Norvig "AI – A Modern Approach", 2nd edition, Pearson Education, 2007

Reference Books

1. E. Rich, K. Knight, S.B. Nair, Artificial Intelligence, 3/e, TMH, 2008.
2. S.J. Russel, P. Norvig Artificial Intelligence: A Modern Approach, 3 /e, PrenticeHall, 2009.
3. Ivan Bratka, "PROLOG Programming for Artificial Intelligence", Addison Wesley, 1986.

Web References

1. <https://www.sitesbay.com/ai/artificial-intelligence-types-of-artificial-intelligence>
2. https://www.tutorialspoint.com/artificial_intelligence/index.htm
3. <https://tutorialspoint.dev/computer-science/machine-learning/artificial-intelligence-an-introduction>
4. <https://www.javatpoint.com/artificial-intelligence-tutorial>
5. <https://www.tutorialandexample.com/artificial-intelligence-tutorial/>



A20CPL509

PYTHON AND NETWORK LAB

L	T	P	C	Hrs
0	0	4	2	30

Course Objectives

- To practice the fundamental programming methodologies in the Python programming language.
- To apply logical skills for problem solving using control structures and arrays.
- To implement, test and debug programs that use different data types, variables, strings, arrays, pointers and structures.
- To design basic networking styles and provides recursive solution to problems.
- To understand the miscellaneous aspects of networking.

Course Outcomes

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

- CO1 – Apply and practice logical formulations to solve simple problems leading to specific applications.
 CO2 – Develop python programs for simple applications making use of basic constructs, arrays and strings.
 CO3 – Develop the networking programs using IP.
 CO4 – Design the module for Client and Server.
 CO5 – Construct the network specializations.

List of Exercises**Python**

1. Finding Area of a Triangle, Rectangle and Square.
2. Checking whether a given number is Prime or not.
3. Implementation of User defined functions.
4. Various operations on List and Tuples.
5. Various operations on string and dictionary.
6. Various types of inheritance using python.

Network

7. Detect Network Changes with IP Address.
8. Log Management with Python and Network Monitoring with Cacti.
9. NetFlow and sFlow Based Monitoring.
10. Alerting and Email Notification using networking system.
11. Testing DHCP Server and Client.
12. Test Network Speed with Python.

Reference Books

1. Stallings, W., "Data and Computer Communications", 10th Ed., Prentice Hall Int. Ed., 2013.
2. John V Guttag, "Introduction to Computation and Programming Using Python", MIT Press, Revised and expanded Edition, 2013.

Web References

1. <https://pythonprogramming.net/introduction-learn-python-3-tutorials/>
2. <https://www2.mvcc.edu/users/faculty/jfiore/CP/labs/LaboratoryManualForComputerProgramming.pdf>
3. <https://www.codecademy.com/learn/learn-python>
4. <https://www.geeksforgeeks.org/last-minute-notes-computer-network/>
5. <https://lecturenotes.in>



A20CPP501

MINI PROJECT (C# / JAVA / PYTHON)

L	T	P	C	Hrs
0	0	4	2	30

Table: 10 CAM & ESM break-up for Mini Project

SI. No	Description			Weightage
1	Continuous Assessment Marks			
a	Review 1	Review Committee*	5	10
		Guide	5	
b	Review 2	Review Committee*	5	10
		Guide	5	
c	Review 3	Review Committee*	15	30
		Guide	15	
	Total CAM			50
2	End Semester Marks			
a	Evaluation of Mini Project report	Internal Examiner	20	40
		External Examiner	20	
b	Outcome*	Conference Presentations / Publication of papers /prototypes /patents etc	10	10
	Total ESM			50
	Total Marks			100

A20CPT612

.NET TECHNOLOGY

L	T	P	C	Hrs
3	0	0	4	60

Course Objectives

- To understand the fundamentals of developing modular application by using object oriented concepts.
- To utilize the .NET Controls to build distributed enterprise applications.
- To develop Console Application, Windows Application and Web Applications using object oriented concepts.
- To learn the State Management.
- To connect to multiple data sources and managing them effectively.

Course Outcomes

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

CO1 - Learn about MS.NET framework developed by Microsoft.

CO2 - Develop and implement Applications with C#.

CO3 - Design the interface for application development.

CO4 - Understand the State Management and deployment in the .NET.

CO5 - Explore Assemblies and Deployment in Data Access with ADO.NET.

UNIT I INTRODUCTION**(12 Hrs)**

Introduction to .NET – .NET Framework – Common language Runtime (CLR) – Common Type System (CTS) – Common language Specification (CLS) – Compilation process – Assemblies – Namespaces – Command line compiler.

UNIT II CONTROLS**(12 Hrs)**

Controls: HTML Server Controls – Web Server Controls – Web User Controls – Validation Controls – Custom Web Controls – Ad rotator Control – Internet Explorer Control – Calendar Control.

UNIT III C# FUNDAMENTALS**(12 Hrs)**

C# class - object - string formatting - Types - scope - Constants - C# iteration - Control flow - Operators - Array - String - Enumerations - Structures - Custom namespaces. Programming constructs – value types and reference types – object oriented concepts – Encapsulation – Inheritance – polymorphism – Interfaces – collections – Multithreading.

UNIT IV STATE MANAGEMENT**(12 Hrs)**

State Management: View State – Control State – Hidden Fields – Cookies – Query Strings – Application State – Session State.

UNIT V DATABASE PROGRAMMING**(12 Hrs)**

Data Access with ADO.NET – Architecture – Data reader – Data Adapter – Command – Connection – Data set – Data binding – Data Grid Control – XML based Data sets.

Text Books

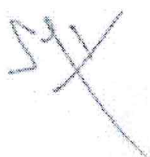
1. David Chappell, "Understanding .NET – A Tutorial and Analysis", Addison Wesley, 2002.
2. Herbert Schildt, "C# 3.0 The Complete Reference", McGraw-Hill Professional, Third Edition, 2009.
3. Keogh, "J2EE The Complete Reference", Tata McGraw-Hill, 2015.

Reference Books

1. Andrew Troelsen, Pro C# 5.0 and the .NET 4.5 Framework, Sixth edition, A Press, 2012.
2. Joh Skeet, C# in depth, Manning publications, Third Edition, 2014. .
3. AdrewStellman and Jennifer Greene, Head First C#, Third Edition, O'Reilly, 2013.

Web Resources

1. <https://www.c-sharpcorner.com/csharp-tutorials>
2. <https://www.guru99.com/c-sharp-tutorial.html>
3. <https://www.sitesbay.com/csharp/index>
4. <https://www.sitesbay.com/interview/dot-net>



A20CPT613	SOFTWARE ENGINEERING	L	T	P	C	Hrs
		3	1	0	4	60

Course Objectives

- To understand the various models and methods.
- To gain about software development life cycle models.
- To develop the software design.
- To connect the coding techniques.
- To learn the testing of software.

Course Outcomes

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

CO1 - Learn about the various models and methods.

CO2 - Develop and implement the software life cycle models.

CO3 - Design the software models.

CO4 - Analyze the coding techniques.

CO5 – Explore the testing of software.

UNIT INTRODUCTION**(12Hrs)**

Introduction to Software - Software characteristics - Software applications - Software Engineering a Generic view-Software process-Software process model-The Linear sequential - Model-Prototyping Model-RAD Model-Fourth Generation Techniques.

UNIT II SOFTWARE MEASURES AND METRICS**(12Hrs)**

Measures, Metrics and Indicators-Software metrics Process metrics - Project metrics. Software measurement size oriented metrics Function oriented metrics Measuring Quality Metrics for small organization Establishing a software metrics program.

UNIT III SOFTWARE PROJECT PLANNING**(12Hrs)**

Software Project Planning-objectives-Feasibility-Software project Estimation Empirical Estimation models. The structure of Estimation models-COCOMO model - Software Risks-Software Quality Assurance.

UNIT III SOFTWARE DESIGN**(12Hrs)**

Software Design: Fundamental Design Concepts - Modules and Modularization Criteria –Design Notations –Design Techniques -Detailed Design Considerations -Real-Time and Distributed System-Design -Test Plans -Milestones, walkthroughs, and Inspections.

UNIT IV SOFTWARE TESTING**(12Hrs)**

Software Testing Technique - Software Testing Fundamentals Testing objectives Testing Principles - Testability - Test case Design-White Box Testing - Basic path testing-Control Structure Testing-Black Box Testing.

Text Books

1. R. Fairley, "Software Engineering Concepts", Tata McGraw Hill Edition -2017.
2. Roger S. Pressman, "Software Engineering: A Practitioner's Approach", McGraw Hill, 7th edition, 2010. (Module 1 & Module 5)
3. Software Engineering , Tenth Edition , Pearson by Ian Sommerville

5/21



Reference Books

1. Software Engineering: A Practitioner's Approach by Bruce R. Maxim
2. Pankaj Jalote's Software Engineering: A Precise Approach
3. Software Engineering 0th Edition, Kindle Edition by Suraiya Hussain

Web References

1. <https://www.sitesbay.com/software-engineering/index>
2. <https://www.sitesbay.com/software-engineering/se-software-project-management-tools>
3. <https://www.sitesbay.com/software-engineering/se-risk-management-in-software-engineering>
4. https://www.tutorialspoint.com/software_engineering/index.htm



A20CPT614

CLOUD COMPUTING

L	T	P	C	Hrs
3	1	0	4	60

Course Objectives

- To define the fundamental ideas behind Cloud Computing.
- To classify the basic ideas and principles in cloud information system.
- To relate cloud storage technologies and relevant distributed file systems
- To understand the Big Data Platform and its Use cases
- To provide an overview of Apache Hadoop, Provide HDFS Concepts and Interfacing with HDFS

Course Outcomes

After completion of the course, the students should be able to:

- CO1** – Explain the core concepts of the cloud computing paradigm.
CO2 – Apply fundamental concepts in cloud infrastructures.
CO3 – Illustrate the fundamental concepts of cloud storage such as Amazon S3 and HDFS.
CO4 – Explain the Utility Computing concepts.
CO5 – Understand the Amazon Web Services concepts.

UNIT I INTRODUCTION**(12Hrs)**

Introduction to Cloud Computing – The Evolution of Cloud Computing – Hardware Evolution – Internet Software Evolution – Server Virtualization - Federation in the Cloud - Presence in the Cloud.

UNIT II SERVICES**(12Hrs)**

Web Services Deliver from the Cloud – Communication-as-a-Service – Infrastructure-as-a-Service – Monitoring-as-a-Service – Platform-as-a-Service – Software-as-a-Service – Building Cloud Network.

UNIT III CLOUD INFRASTRUCTURE**(12Hrs)**

Introduction - Advancing towards a Utility Model – Evolving IT infrastructure – Evolving Software Applications – Continuum of Utilities- Standards and Working Groups – Standards - Bodies and Working Groups – Service Oriented Architecture – Business Process Execution Language

UNIT IV UTILITY COMPUTING**(12Hrs)**

Utility Computing Technology – Virtualization – Hyper Threading – Blade Servers - Automated Provisioning - Policy Based Automation – Application Management – Evaluating Utility Management Technology

UNIT V AMAZON WEB SERVICES**(12Hrs)**

Identity and Access Management(IAM) – Elastic Compute Cloud(EC2) – EC2 Instance Storage – S3 – Database & Analytics.

Text Books

1. Kai Hwang, Geoffrey C. Fox, Jack G. Dongarra, "Distributed and Cloud Computing, From Parallel Processing to the Internet of Things", Morgan Kaufmann Publishers, 2012.
2. Ritting house, John W., and James F. Ransome, —Cloud Computing: Implementation, Management and Security, CRC Press, 2017.

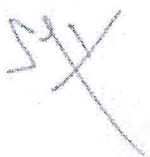


Reference Books

1. John W. Rittinghouse and James F. Ransome, "Cloud Computing Implementation, Management and Security", 2010, CRC Press, Taylor & Francis Group, Boca Raton London New York. [Unit -11 and Unit II]
2. Alfredo Mendoza, "Utility Computing Technologies, Standards, and Strategies", Artech House INC, 2007. [Unit -11I to Unit V]
3. Bunker and Darren Thomson, "Delivering Utility Computing", 2006, John Wiley & Sons Ltd.
4. Pete Warden, "Big Data Glossary", O'Reilly, 2011.

Web References

1. [www.coltdacentres.net/Cloud Technology](http://www.coltdacentres.net/Cloud%20Technology).
2. <https://www.zdnet.com/article/what-is-cloud-computing-everything-you-need-to-know-about-the-cloud/>
3. www.digitalocean.com/community/tutorials/an-introduction-to-big-data-concepts-and-terminology



A20CPL610	.NET TECHNOLOGY LAB	L	T	P	C	Hrs
		0	0	4	2	30

Course Objectives

- To understand the fundamentals of developing modular application by using object oriented concepts.
- To utilize the C# and .NET framework to build distributed enterprise applications.
- To develop Console Application, Windows Application and Web Applications.
- To connect to multiple data sources and managing them effectively.
- To learn the product development.

Course Outcomes

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

CO1 - Learn about MS.NET framework developed by Microsoft.

CO2 - Develop and implement Applications with C#.

CO3 - Design the interface for application development.

CO4 - Understand the .NET framework and deployment in the .NET.

CO5 - Explore Assemblies and Deployment in .NET enterprise applications.

List of Experiments

1. Classes and objects
2. Inheritance
3. Operator Overloading
4. Threading
5. Events and delegates
6. Working with windows forms controls
7. Validating data
8. Creating custom dialog box
9. Designing an MDI application with menu
10. Retrieving data from a SQL database

Text Books

1. David Chappell, "Understanding .NET – A Tutorial and Analysis", Addison Wesley, 2015.
2. Herbert Schildt, "C# 3.0 The Complete Reference", McGraw-Hill Professional, Third Edition, 2015.
3. Keogh, "J2EE The Complete Reference", Tata McGraw-Hill, 2015.

Reference Books

1. Andrew Troelsen, Pro C# 5.0 and the .NET 4.5 Framework, Sixth edition, A Press, 2012.
2. Joh Skeet, C# in depth, Manning publications, Third Edition, 2014.
3. AdrewStellman and Jennifer Greene, Head First C#, Third Edition, O'Reilly, 2013.

Web Resources

1. <https://www.c-sharpcorner.com/csharp-tutorials>
2. <https://www.guru99.com/c-sharp-tutorial.html>
3. <https://www.sitesbay.com/csharp/index>
4. <https://www.sitesbay.com/interview/dot-net>

5/5



A20CPP602

PROJECT WORK & VIVA VOCE

L	T	P	C	Hrs
0	0	10	5	75

The Project work is to be evaluated as follows:

1. The internal assessment (40 marks) is awarded as follows:

15 marks is awarded based on two internal project reviews conducted in periodic intervals by a panel comprising of members of the Department during the tenure of the project.

The student's project guide awards 15 marks for the project work and 10 marks for attendance (attendance marks as specified in the Pondicherry University UG CBCS regulations).

2. The End Semester Examination assessment (60 marks) is evaluated under two aspects

- i) Project Work – (40 marks)
- ii) Project Report and Viva-Voce (20 marks)

Table: 10 CAM & ESM break-up for Project work

Sl. No	Description			Weightage
1	Continuous Assessment Marks			
a	Review 1	Review Committee [#]	5	10
		Guide	5	
b	Review 2	Review Committee [#]	5	10
		Guide	5	
c	Review 3	Review Committee [#]	10	20
		Guide	10	
Total CAM				40
2	End Semester Marks			
a	Evaluation of final report and Viva-voce	Internal Examiner	25	50
		External Examiner	25	
b	Outcome*	Conference Presentations / Publication of papers /prototypes /patents etc	10	10
Total ESM				60
Total Marks				100

A20CPS606

RESEARCH METHODOLOGY

L	T	P	C	Hrs
0	0	4	2	30

Course Objectives

- To facilitate science and research
- To introduce research and methodology concepts
- To inculcate data collection
- To implement the scientific writing
- To construct the basic ethics

Course Outcomes

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

- CO 1** – Identify various concepts science and research
CO 2 – Describing research and methodology concepts
CO 3 – Utilize the data collection
CO 4 – Managing the scientific writing
CO 5 – Deploy the basic ethics.

UNIT I SCIENCE AND RESEARCH**(6 Hrs)**

Definition – History – Evolution of Scientific Inquiry, Scientific Research: Definition, Characteristics, types, need of research. Identification of the problem, assessing the status of the problem, formulating the objectives

UNIT II INTRODUCTION TO RESEARCH METHODOLOGY**(6 Hrs)**

Meaning and importance of Research – Types of Research – Selection and formulation of Research Problem Research Design – Need – Features – Inductive, Deductive and Development of models Developing a Research Plan – Exploration, Description, Diagnosis, Experimentation, Determining Experimental and Sample Designs

UNIT III DATA COLLECTION AND ANALYSIS**(6 Hrs)**

Sources of Data – Primary, Secondary and Tertiary – Types of Data – Categorical, nominal & Ordinal. Methods of Collecting Data : Observation, field investigations, Direct studies – Reports, Records or Experimental observations. Sampling methods – Data Processing and Analysis strategies- Graphical representation.

UNIT IV SCIENTIFIC WRITING**(6 Hrs)**

Structure and components of Scientific Reports – types of Report – Technical Reports and Thesis – Significance – Different steps in the preparation – Layout, structure and Language of typical reports - Illustrations and tables – Bibliography, Referencing and foot notes –Importance of Effective Communication.

UNIT V ETHICS**(6 Hrs)**

Ethical Issues – Ethical Committees – Commercialization – copy right – royalty – Intellectual Property rights and patent law – Track Related aspects of intellectual property Rights – Reproduction of published material – Plagiarism – Citation and Acknowledgement – Reproducibility and accountability.

Text Books

1. Garg.B.L., Karadia, R., Agarwal,F. and Agarwal, U.K., 2002. An introduction to Research Methodology, RBSA Publishers.
2. Kothari, C.R.(2008). Research Methodology: Methods and Techniques. Second Edition. New Age International Publishers, New Delhi.
3. Sinha, S.C. and Dhiman, A.K., 2002. Research Methodology, Ess Publications. 2 volumes.

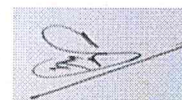
Reference Books

1. Gupta S.P. (2008). Statistical Methods. 37 th ed. (Rev)Sultan Chand and Sons. New Delhi. 1470 p.
2. Leon & Leon (2202). Internet for everyone, Vikas Publishing House.
3. Wadehra, B.L.2000. Law relating to patents, trademarks, copyright designs and geographical indications. Universal Law Publishing.
4. Research Methodology Dr P M Bulakh,Dr P. S. Patki and Dr A S Chodhary 2010 Published by Expert Trading Corporation Dahisar West, Mumbai 400068

Web References

1. <https://gradcoach.com/what-is-research-methodology/>
2. <https://www.guide2research.com/research/how-to-write-research-methodology>
3. https://www.tutorialspoint.com/thematic_apperception_test/thematic_apperception_test_research_methods.htm
4. <https://www.wisdomjobs.com/e-university/research-methodology-tutorial-355.html>

2/1



DISCIPLINE SPECIFIC ELECTIVES
Discipline Specific Electives – III (DSE - III) – offered in Fifth Semester

A20CPE507	DATA SCIENCE USING R	L	T	P	C	Hrs
		3	0	0	3	45

Course Objectives

- To understand the concepts of Data Science.
- To learn about Data analytics.
- To learn about Relational database.
- To learn the concept of Map reduce.
- To know about Machine Learning.

Course Outcomes

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

- CO 1** - Understand the basic concepts of Data Science.
CO 2 - Understand the basic concepts of Data Analytics.
CO 3 - Usage of Relational Databases.
CO 4 - Basics of Map Reduce Method.
CO 5 - Basic concepts of machine Learning.

UNIT I INTRODUCTION TO DATA SCIENCE**(9 Hrs)**

Introduction to Data Science: Definition of Data Science, Need for Data Science, components of data science - Data science process – Introduction to NoSQL

UNIT II DATA ANALYTICS**(9 Hrs)**

Business Intelligence Systems Application and Development: BIG DATA Overview: Types, Characteristics, Architecture, BI vs Data Science - Data Analytics Life Cycle - Big Data Analytics: Methodology - Technologies – Advantages

UNIT III RELATIONAL DATABASE**(9 Hrs)**

Big data Management - Operational Databases: importance of RDBMS in Big Data Environment, Non-Relational databases, key value pair database, document database, columnar database, graph database, spatial database

UNIT IV MAP REDUCE**(9 Hrs)**

Map Reduce Fundamentals: Tracing the Origins of MapReduce, Understanding the mapFunction, Adding the reduce Function, Putting map and reduce Together, Optimizing Map Reduce Tasks.

UNIT V MACHINE LEARNING**(9 Hrs)**

Introduction to Machine Learning for Data Analysis: Introduction: Need, Types of ML learning algorithms: Supervised and Semi-supervised, Unsupervised, reinforcement.

Text Books

1. Davy Cielen, Arno D. B. Meysman, Mohamed Ali, "Introducing Data Science", manning publications, 2016 (Chapter 1 to 3 for Module I & Module V)
2. "Data Science and Big Data Analytics", EMC Education Service, Wiley. 2015 (Chapter 1 & Chapter 2 for module II)
3. Alan Nugent, Dr. Fern Halper, Marzia Kaufman, "Big Data for Dummies", by Judith Hurwitz, , Wiley pub, 2013. (Chapter 7 & 8 for module III and IV)

Reference Books

1. R for Data Science, Hadley Wickham & Garrett Grolemund, O'Reilly
2. R for everyone, Advance Analytics and Graphics, by Jared P. Lander, Second Edition.
3. R in Action: Data Analysis and Graphics with R, by Dr. Rob Kabacoff, Second Edition.
4. Rudolph Russell, "Machine Learning Step-by-Step Guide To Implement Machine Learning algorithms with Python", 2018. (Chapter I for module V)

Web References

1. <https://r4ds.had.co.nz/introduction.html>
2. <https://online-learning.harvard.edu/course/data-science-r-basics?delta=2>
3. <https://www.analyticsvidhya.com/blog/2016/02/complete-tutorial-learn-data-science-scratch/>
4. <https://www.tutorialspoint.com/r/index.htm>
5. https://www.tutorialspoint.com/data_science_machine_learning_data_analysis_python_and_r/index.asp
6. https://www.tutorialspoint.com/r/r_overview.htm



A20CPE508	INTRUSION DETECTION SYSTEM AND PREVENTION	L	T	P	C	Hrs
		3	0	0	3	45

Course Objectives

- To provide a solid foundation to the students in network security
- To provide a solid foundation to the students in intrusion detection and prevention.
- To enable the students to master the knowledge about intrusion detection and prevention in the context of real-life applications.
- To prepare the students for understanding and evaluating critically
- To prepare the students for understanding and assimilating new knowledge and emerging technology in network security

Course Outcomes

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

- CO1** - Understand the physical location, the operational characteristics and the various functions performed by the intrusion detection and prevention system.
- CO2** - Describe how components in different layers inter-operate in the intrusion detection and prevention system.
- CO3** - Learn new techniques and to align new security technologies to existing network infrastructure
- CO4** - Understand the current and effective architecture to deal with network security threats.
- CO5** - Apply intrusion detection alerts and logs to distinguish attack by using SNORT tool..

UNIT I INTRODUCTION**(9 Hrs)**

History of Intrusion detection, Audit, Concept and definition , Internal and external threats to data, attacks, Need and types of IDS, Information sources Host based information sources, Network based information sources.

UNIT II INTRUSION DETECTION AND NETWORK TRAFFIC SIGNATURE**(9 Hrs)**

Components of IDS, Steps of implementation and monitoring, Host- and network-based IDS, Implementing and evaluating IDS, intrusion detection versus intrusion prevention, Signature analysis, Detecting traffic signatures.

UNIT III INTRUSION DETECTION AND PREVENTION TECHNIQUES**(9 Hrs)**

Host-based intrusion detection system (IDS)- Intrusion prevention system (IPS)- Network based IDS/IPS- Data collection for IDS/IPS- Intrusion detection techniques- misuse detection- pattern matching, rule-based and state-based.

UNIT IV IDS and IPS ARCHITECTURE**(9 Hrs)**

Tiered architectures- single-tiered-multi-tiered- peer-to-peer- Sensor- sensor functions-sensor deployment and security- Agents-agent functions- agent deployment and security- Manager component-manager functions- manager deployment and security.

UNIT V IDP TOOLS**(9 Hrs)**

Introduction to Snort, Snort Installation Scenarios, Installing Snort, Running Snort on Multiple Network Interfaces, Snort Command Line Options. Step-By-Step Procedure to Compile and Install Snort Location of Snort Files, Snort Modes Snort Alert Modes.

Text Books

1. Ali A. Ghorbani, Network intrusion detection and prevention concepts and techniques, Springer, 2010
2. C. Endorf, E. Schultz and J. Mellander, Intrusion Detection & Prevention, McGrawHill/Osborne, 2004.
3. Rafeeq Rehman : " Intrusion Detection with SNORT, Apache, MySQL, PHP and ACID," 1st Edition, Prentice Hall , 2003



Reference Books

1. Christopher Kruegel, Fredrik Valeur, Giovanni Vigna: "Intrusion Detection and Correlation Challenges and Solutions", 1st Edition, Springer, 2005.
2. Carl Endorf, Eugene Schultz and Jim Mellander " Intrusion Detection & Prevention", 1st Edition, Tata McGraw-Hill, 2004.
3. Stephen Northcutt, Judy Novak : "Network Intrusion Detection", 3rd Edition, New Riders Publishing, 2002

Web References

1. <https://opensourceforu.com/2017/04/best-open-source-network-intrusion-detectiontools/>
2. <https://security.berkeley.edu/intrusion-detection-guideline>
3. <https://www.snort.org/>



A20CPE509**SYSTEM SOFTWARE**

L	T	P	C	Hrs
3	0	0	3	45

Course Objectives

- To understand the various concepts of system software.
- To gain about the Assembler.
- To learn about Macro and Macro processors
- To learn about Loaders
- To learn the Compilers.

Course Outcomes

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

CO1 - Learn about the various concepts of system software.

CO2 – Learn about various types of Assembler.

CO3 – Learn about Macros and Macro processor

CO4 - Analyze the working of loaders.

CO5 – Explore the working of compiler.

UNIT I INTRODUCTION**(9 Hrs)**

What is System Software – Features – Types of System Software – Operating System – Programming Language Translators – Device Drivers – Firmware Software – Utility Software.

UNIT II ASSEMBLER**(9 Hrs)**

Assemblers: Purpose-pass 1 and pass 2 of assembly with flow chart-symbol table-literal table-base table generation.

UNIT III MACROS**(9 Hrs)**

Macros: Concept-definition macro call-macro call with arguments conditional - nested macros.- Macro processor: Definition-generation of macro definition table macro name table argument list array-two pass-macro processors -simple two-pass algorithms.

UNIT IV LOADERS**(9 Hrs)**

Loaders: concept - General-loader scheme-four functions of a loader allocation-relocation-linking and loading as accomplished by absolute-relocating and direct-linking loader.

UNIT V COMPILER**(9 Hrs)**

Definition-lexical analysis-syntax analysis –interpretation-parse tree storage allocation-code generation-optimization-structure of compiler. Features of High level languages: PL/1 language data types and structure storage allocation and scope of names accessing flexibility - functional modularity asynchronous operation.

TEXT BOOK

1. John J. Donavan , System programming
2. Leland L. Beck "System Software-Introduction to system program
3. Damdhare., Introduction to system software

Reference books

1. " System Software: An Introduction to Systems Programming" by Leland L Beck.
2. " System Software" by M Joseph.
3. " System Software: An Introduction to Systems Programming for VTU" by Leland L Beck.

Web references

1. https://www.tutorialspoint.com/basics_of_computers/basics_of_computers_software_concepts.html
2. <https://www.geeksforgeeks.org/introduction-of-assembler/>
3. <https://www.geeksforgeeks.org/macro-processor/>
4. http://www.tezu.ernet.in/~utpal/course_mat/ss_compil.html
5. <https://www.techopedia.com/definition/8104/loader>



DISCIPLINE SPECIFIC ELECTIVES**Discipline Specific Electives – IV (DSE - IV) – offered in Sixth Semester**

A20CPE610	CLIENT / SERVER TECHNOLOGY	L	T	P	C	Hrs
		3	0	0	3	45

Course Objectives

- To learn about objective evaluations and details of Client/Server development tools.
- To know about the network structures.
- To use in operating system and database management system
- To learn the basics of applications in client server technology.
- To know about system development and web services

Course Outcomes

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

- CO 1 - Understand the objective evaluations and details of Client/Server development tools.
 CO 2 - Get and detailed networking concepts.
 CO 3 - Used in operating system and database management system.
 CO 4 - Basics of applications in client server technology.
 CO 5 – Web services developments.

UNIT I INTRODUCTION TO CLIENT SERVER**(9 Hrs)**

Introduction – defining client/server computing – Classification of client/server systems – clients/server – advantages & disadvantages –driving forces behind client/server computing

UNIT II TCP/IP**(9 Hrs)**

Introduction – two approaches of network communication – Ethernet technology – fiber distributed data interconnect(FDDI) – internet architecture – interconnection through IP routers – UDP. Related TCP – Segment format –TCP checksum computation – TCP connection reset – TCP state machine – TCP performance – TCP/IP over ATM network – VPN

UNIT III CLIENT SERVER DATABASE**(9 Hrs)**

Client/Server databases – Introduction – client/server in respect of databases – client/server database architecture – database middleware component – access to multiple databases – distributed client/server database systems – distributed DBMS – web/database system for client/server applications

UNIT IV CLIENT SERVER APPLICATION**(9 Hrs)**

Client/server application components – introduction – technologies for client/server application – services of a client/server application – categories of client/server applications – client services – server services – client/server application connectivity – client/server application: Layered Architecture

UNIT V WEB SERVICES**(9 Hrs)**

System development – hardware & software requirements – communication interface technology – client/server technology & web services – what are web services – web services & client/server/browser – server technology – client/server technology & web applications

Text Book

1. Subhash Chandra Yadav & Sanjay Kumar Singh, "An Introduction to Client/Server Computing", New Age International Publishers, 2009.
2. Douglas E Comer, "Internetworking with TCP/IP-Principles, Protocols and Architecture", Pearson Education.
3. Dawana Travis Dewire, "Client/Server Computing", Tata McGraw -Hill Publishing Company Limited, New Delhi, 2003.

Reference Books

1. Patrick Smith, Client/server computing (Professional reference series), Paperback .

5/11



Academic Curriculum and Syllabi R-2020

2. Robert Orfali, Dan Harkey and Jeri Edwards, "Essential Client/Server Survival Guide", Galgotia Publications, New Delhi, 2001.
3. Joel P Kaster, "Understanding Thin Client/Server Computing", Prentice Hall of India, New Delhi, 2001.
4. Jein Edwards, "3 tier Client/server at Work", Wiley Computer Publishing, USA, 1999. 4. AshhofaiolTomy Martin, "Building N - tier Applications with COM and VB 6.0", Wiley Computer Publishing, Singapore, 1999.
5. Travis Derive D, "Second - generation Client/Server Computing" McGraw Hill, New Delhi, 1997.

Web References

1. <https://www.tutorialspoint.com/Client-Server-Computing>
2. <https://www.eukhost.com/blog/webhosting/client-server-technology/>
3. <https://www.quora.com/What-are-client-server-technology>

5/1



	L	T	P	C	Hrs
A20CPE611 ANIMATION AND VISUAL EFFECTS	3	0	0	3	45

Course Objectives

- Evaluate teaching and learning processes using assistive technology for students with disabilities.
- Describe and demonstrate how people with disabilities can benefit from working on multidisciplinary team.
- Describe and demonstrate the use of technology devices for people with disabilities.
- Identify and evaluate technologies that maximize the potential of people with disabilities.
- Describe and demonstrate the use of assistive technology performance areas that facilitate inclusion in academic learning and work settings.

Course Outcomes

After Completion of the course, the students will be able to

CO1 - Develop technology-enabled assessment and evaluation strategies

CO2 - Demonstrate knowledge, attitudes and skills of assessment professionals working on multidisciplinary team

CO3 - Facilitate instruction in the new technology devices that emerge within digital / interactive learning environments

CO4 - Implement curriculum methods and strategies that use technology activities to maximize student learning

CO5 - Identify and apply emerging technologies in learning and working environments

UNIT I – VFX & ANIMATION**(9 Hrs)**

VFX- Understanding VFX - Brief history of VFX - Need for visual effects – Future of visual effects – Pros & Cons of visual effects - Applications of VFX – Comparison between VFX and Animation **Animation**- History of animation – Applications of animation – Career in Animation – Pros & Cons of animation

UNIT II – LEARNING AFTER EFFECTS**(9 Hrs)**

The Platform – Tools used – Plugins & Types – Imports & Exports - Masking – Object Duplication - Motion Tracking – Rotoscoping - Colour Play – Visual Effects - Render tab & Advance option – Exporting to Media Encoder

UNIT III – LEARNING PREMIERE PRO**(9 Hrs)**

The Platform - Difference between After Effects & Premiere Pro – Effects & Presets tab – Audio Splitting & its work – LUTs & its Application – Working with Creative Curve – Render Tab & Advance Options.

UNIT IV - INTRODUCTION TO BLENDER & TOOLS**(9 Hrs)**

Basics of Blender – Understanding Blender Interface & Tools – The Blender Scene - Project overview & character Design – Using other design methods

UNIT V - BLENDER WORKS**(9 Hrs)**

Modeling & its tools in Blender –Character Modelling –Unwrapping, Paining & Shaders – Character Rigging & Animation – The Render Page – Lighting & Composition

Text Book

1. Learning Blender: A Hands-On Guide to Creating 3D Animated Characters By Oliver Villar

Reference Books

1. Adobe After Effects CC Classroom in a Book 2018 Release By Lisa Fridsma & Brie Gyncild
2. Adobe Premiere Pro CC Classroom in a Book 2018 Release By Maxim Jago

Web Resources

1. https://www.synchronorm.com/products/depence2/visualization/overview/?gclid=EAlalQobChMIst_Z8Paw6gIVgXwrCh0slwYXEAAAYAiAAEgK_2fD_BwE
2. <https://libguides.bournemouth.ac.uk/c.php?g=471655&p=4636056>

5/1



A20CPE612

ETHICAL HACKING

L	T	P	C	Hrs
3	0	0	3	45

Course Objectives

- Investigate how to attack a computer system.
- Explore low tech hacking techniques Investigate web-based hacking.
- Explore wireless network hacking.
- Investigate Trojans and other attacks.
- Perform penetration testing.

Course Outcomes

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

- CO1** - Identify and analyze the stages an ethical hacker requires to take in order to compromise a target system.
- CO2** - Identify tools and techniques to carry out a penetration testing.
- CO3** - Critically evaluates security techniques used to protect system and user data.
- CO4** - Demonstrate systematic understanding of the concepts of security at the level of policy and strategy in a computer system.
- CO5** - Develop a practical understanding of the current cyber security issues.

UNIT I INTRODUCTION**(9 Hrs)**

Ethical Hacking Introduction - Attack Scenarios - Emulating Cyber Attacks - Cyber Laws - Programming (C, Python, Assembly Language Basics, Computer Memory)

UNIT II SCOPE**(9 Hrs)**

Scope of Hacking - Red Team Operations - Purple Team Operation - Bug Bounty Programs

UNIT III EXPLOITATION**(9 Hrs)**

System Exploitation Basic System Exploits - Windows Exploits – Power shell Exploitation - Web Application Exploitation

UNIT IV MALWARE**(9 Hrs)**

Malware Analysis Study of Malware - Mobile Malware – Ransomware.

UNIT V ETHICAL HACKING MOTION**(9 Hrs)**

Putting Ethical Hacking in Motion- Social Engineering- Why Hackers Use Social Engineering- Understanding the Implications- Performing Social-Engineering Attacks.

Text Books

1. Allen Harper, Shon Harris, Jonathan Ness, Chris Eagle, Gideon Lenkey, and Terron Williams, "Gray Hat Hacking The Ethical Hacker's Handbook", McGraw-Hill, 5th Edition, 2018.
2. Kenneth C.Brancik "Insider Computer Fraud" Auerbach Publications Taylor & Francis Group– 2008.
3. Kimberly Graves, "Certified Ethical Hacker STUDY GUIDE", Wiley publication, 2010.

Reference Books

1. Sean-Philip Oriyano, "Hacker Techniques, Tools, and Incident Handling, Jones and Bartlett Learning LLC", 3rd Edition, 2018.
2. AnkitFadia, "The Unofficial Guide to Ethical Hacking", Premier Press, 2nd Edition 2006.
3. LakshayEshan, "Ethical Hacking A Beginners Guide to Learning the World of Ethical Hacking", Amazon Digital Services LLC - KDP Print US, 2018.
4. RafayBaloch, "Ethical Hacking and Penetration Testing Guide", CRC Press, 2017.
5. Adidas Wilson, "Hacking Essentials The Beginner's Guide To Ethical Hacking And Penetration Testing", Adidas Wilson, 2019.

Web References

1. <https://freedomhacker.net> › Internet Security.
2. <https://www.guru99.com/c-sharp-tutorial.html>.
3. <https://www.hackthissite.org/>
4. <https://www.eccouncil.org/programs/certified-ethical-hacker-ceh/>

5/1



1970-1971

2. E. 10. 62 3. 5.