DEPARTMENT OF INFORMATION TECHNOLOGY

About the Department

G.T.N. Arts college is the only aided college functioning in Dindigul district for the welfare of urban and rural based men and women students. It caters to the needs of the most economically weaker students. IT department was started during the academic year 2006 – 2007. IT department is as one of the departments of Madurai Kamarajar University affiliated Colleges producing university rank holders. The department also offers consultations for various computer oriented industries in and around dindigul district. IT Student is regularly visiting various software industries every year as a part of the academic and industrial relationship. We are conducting placement training classes regularly for our students. Our students are placed in various companies through on campus interviews and working with remarkable packages.

PRINCIPAL

Dr. P. Balagurusamy,M.A., M.Phil., M.Ed., P.G.D.C.A., Ph.D.,

STAFF MEMBERS

1.Mrs.S.Vijayalakshmi M.Sc.,M.Phil.,DCA.,SET.,NET.,	**- Assistant Professor and Head**
2.Mrs. S.AmeenaBanu, M.C.A., M.Phil.,	**- Assistant Professor**
3.Mr.N.Thambirajan, M.Sc., M.Phil.,	**- Assistant Professor**
4.Mrs.P.Murugeswari M.Sc., M.Phil.,SET.,B.Ed.,	**- Assistant Professor**
5.Dr.C.KirubaharanM.C.A.,M.Phil.,PhD	**- Assistant Professor**
6. Mrs.P.Chandrakala M.C.A., M.Phil.,M.E(CSE).,NET.,	**- Assistant Professor**
7. Mrs.R.Gunasundari M.C.A.,	**- Assistant Professor**

Programme Outcomes (Pos)

1.Apply the knowledge acquired in the respective disciplines and also have a multidisciplinary perspective towards the study of sciences.

2.Attain skills like analytical reasoning, critical thinking and problem solving to evince interest in higher education and research for offering solutions to societal and environmental problems.

3.Communicate articulately and effectively and interpret the results obtained from scientific studies and put forth innovative ideas to carve a niche in their domain.

4.Instill the principles and ethics learnt from the field of study and exhibit the qualities like leadership, entrepreneurship and teamwork for discharging their duties as responsible citizens.

5.Utilize the growing advancements in Information and Communication Technology and embrace digital learning to become life-long learners.

Programme Specific Outcomes

1.Utilize the knowledge of nucleus programs in the IT Industry.

2.Implement computer skill in the areas related to multimedia, website design, Hardware and networking.

3. Identify, analyze, evaluate problems systematically and provide solutions in IT based domains.

4.Solve the complex problems in every career at every level to step towards the goal.

5. Demonstrate basic knowledge in the areas such as, Software Engineering, Data communication and Networking, Data base management, and Operating Systems for building IT applications.

6.Develop logic and programming skills in computing activities with the help of programming languages.

7. State, design and implement knowledge based discovery and machinebased learning in computer system by using various algorithms.

8.Work as an individual and will be well equipped as a leader in diverse teams and create multifunctional software products.

9. Gaining knowledge of grammatical, conventions, varieties, formulations, courses and culture. Becoming competent to face competitive examinations through development of language skills.

10. Categorise the environmental issues and effects of ecosystem and will also be able to balance the wealth from waste and will be capable of honouring the gender equality.

11. Judge and differentiate between right and wrong moral values and their responsibilities towards community

12. Engage in life-long learning, to remain current in their profession and obtain additional qualifications to enhance their career positions in IT industries.

Under Choice Based Credit System (CBCS)
Course Pattern for B.Sc (Information Technology)

Objectives

The Syllabus for B.Sc IT Programme under semester system has been designed on the basis of Choice Based Credit System (CBCS), which would focus on job oriented programmes and value added education. It will come into effect from June 2020 onwards.

Eligibility

Candidates should have passed the Higher Secondary Examination, Government of Tamil Nadu or any other examination accepted by the syndicate of Madurai Kamaraj University as equivalent there to.

Duration of the Course

The students who join the B.Sc.(IT) Programme shall undergo a study period of three academic years – Six semesters.

Summary of Hours and Credits – Programme name

Part	Semester	Specification	No. of Course	Total Hrs	Total Credit	Total credits
I	I - II	Languages (Tamil / French)	4	24	12	12
II	I - II	English	4	24	12	12
III	I – VI	**Core Courses** Theory Practical Allied Elective Project	 13 10 4 2 1	 52 34 16 8 6	 43 30 16 8 5	102
IV	III - VI	Skill Based Courses	4	8	8	20
IV	III & IV	Self Study Courses 1. Soft Skills I 2. Soft Skills II	2	-	4	
IV	I &II	Non Major Electives	2	4	4	
IV	I & II	1. Value Education 2. Environment and Gender Studies	2	4	4	
V	I-IV	Physical Education Practical (Non-Semester	1	-	2	4
		Extension Activities	1		2	
		Total	50	180	150	150

Course Pattern – from 2020-2021 Batch
Department of Information Technology

Sem.	Part	Study Component	Course Code	Course Title	Hrs	Credit
I	I	Tamil I / French I	20UTAL11/ 20UFRL12	jw;fhy ftpijAk; rpWfijAk; French Language And Civilization I	6	3
	II	English I	20UENL11	English language through literature I	6	3
	III	Core Course I	20UITC11	Introduction to Programming	4	3
		Core Practical I	20UITC1P	Introduction to Programming-Lab	3	3
		Core Practical II	20UITC1Q	Multimedia Tools-Lab	3	3
		Allied Course I	20UMAA12	Discrete Mathematics	4	4
	IV	Non Major Elective Course I	20UITN11	Fundamentals of Information Technology	2	2
	IV	Value Education	20UVEV11	Value Education	2	2
				Total	**30**	**23**
II	I	Tamil II / French II	20UTAL21/ 20UFRL22	gf;jp ,yf;fpaKk; GjpdKk; French Language And Civilization II	6	3
	II	English II	20UENL21	English language through literature II	6	3
	III	Core Course II	20UITC21	Programming in C#.NET	4	3
		Core Practical III	20UITC2P	Programming in C#.NET-Lab	3	3
		Core Practical IV	20UITC2Q	HTML & CSS-Lab	3	3
		Allied Course II	20UMAA22	Operations Research	4	4
	IV	Non Major Elective Course II	20UITN21	E-Commerce	2	2
		Environment and Gender Studies	20UEGS21	Environment and Gender Studies	2	2
	V	Physical Education-Practical	20UPEV2P	Physical Education – Practical (Non Semester Course)	-	2
				Total	**30**	**25**

III	**I**	Tamil III / French III	20UTAL31/ 20UFRL31	fhg;gpa ,yf;fpaKk; ciueilAk; French Language And Civilization III	6	3
		English III	20UENL31	English language through literature III	6	3
	III	Core Course III	20UITC31	Database Management System Concepts	4	4
		Core Practical V	20UITC3P	Relational Database Management System-Lab	4	3
		Core Course IV	20UITC32	Data Structures and Computer Algorithms	4	4
		Allied Course III	20UMAA33	Numerical Methods	4	4
	IV	Skill Based Practical I	20UITS3P	JavaScript-Lab	2	2
	IV	Self Study Course I	20USSS31	Soft Skills I	-	2
				Total	**30**	**25**
IV	**I**	Tamil IV / French IV	20UTAL41 / 20UFRL41	gz;ila ,yf;fpaKk; ehlfKk; / French Language, Culture And Civilization IV	6	3
	II	English IV	20UENL41	English language through literature IV	6	3
	III	Core Course V	20UITC41	Advanced Java Programming	4	3
	IV	Core Practical VI	20UITC4P	Advanced Java Programming -Lab	4	3
		Core Course VI	20UITC42	Operating System Concepts	4	3
		Allied Course IV	20UMAA43	Quantitative Aptitude	4	4
	V	Skill Based Practical II	20UITS4P	Fundamentals of Hardware Practices-Lab	2	2
		Self Study Course II	20USSS41	Soft Skills II		2
		Extension Activities	Common Code	Club Activities		2
				Total	**30**	**25**
V	III IV	Core Course VII	20UITC51	Data Communication and Computer Networks	4	4
		Core Practical VII	20UITC5P	Network Simulation-Lab	4	3

		Core Course VIII	20UITC52	Python Programming	4	4
		Core Practical VIII	20UITC5Q	Python Programming-Lab	4	3
		Core Course IX	20UITC53	Software Engineering	4	3
		Core Course X	20UITC54	Data Mining	4	3
		Core Elective Course I	20UITE51 20UITE52 20UITE53	1.Cryptography and Network Security 2. Ethical Hacking 3.Machine Learning	4	4
		Skill Based Practical III	20UITS5P	PHP and My SQL -Lab	2	2
				Total	**30**	**26**
VI	III	Core Course XI	20UITC61	Introduction to GoLang Programming	4	3
		Core Practical IX	20UITC6Q	GoLang Lab	3	3
		Core Course XII	20UITC62	Computer Graphics	4	3
		Core Practical X	20UITC6R	Computer Graphics	3	3
		Core Course XIII	20UITC63	Big Data Analytics	4	3
		Core Elective Course II	20UITE61	1.Cloud Computing	4	4
			20UITE62	2.Internet of Things		
			20UITE63	3.Theory of Computation		
		Core Project I	20UITC6P	Project Work/Viva Voce	6	5
		Skill Based Practical IV	20UITS6P	Linux Administration	2	2
				Total	**30**	**26**
	Overall Total for all VI Semesters				**180**	**150**

Allied Courses

There will be FOUR Allied courses to fulfill the B.Sc(IT) programme during three years.

Subject	Maximum Marks	Year of Study
Mathematics	100 100	I
Mathematics	100 100	II

The Syllabus for the Allied Courses can be obtained from the Allied Department of Mathematics.

Value Added Courses

The Department of Information Technology is offering the following Value Added Courses for thirty hours for all the UG students with no prejudice to the Under Graduate programme results.

Sl.No.	Semester	Course Code	Course Title
1.	III	20CINF31	Business Analytics
2	IV	20CINF41	Desktop Publishing
3	V	20CINF51	Internet and its Application
4	VI	20CINF61	Cyber Security

Extra Credit Self Paced Courses for Advanced Learners

The Department of B.Sc(IT) has offered the following Extra Credit Self Paced Courses to enlighten the advanced learners. The department persuades the students to take virtual courses on MOOCS, SWAYAM and NPTEL.

(i) IPV4 and IPV6.
(ii) Virtualization
(iii) Amazon Web Services
(iv) UI,UX Design Thinking

Programme	B.Sc.(IT)	Programme Code	UIT
Course Code	20UITC11	Number of Hours/Cycle	4
Semester	I	Max. Marks	100
Part	III	Credit	3
Core Course I			
Course Title	Introduction to Programming		
Cognitive Level	Up to K3		

Preamble

This Course provides the students a well-built foundation on programming concepts and its application. It also facilitates the students to resolve the problems using C program with Linux.

Unit - I Introduction of Linux **8 Hours**

Structure of Linux – Linux file system – Types of users, files and permission – Structure of Password file – Directories and Path name – Linux basic Commands – standard I/O files - redirecting standard I/O files - Pipelines and filters – Process status – Protecting, Terminating, Setting priority and killing a process.

Unit - II Introduction of C **10 Hours**

Basic Elements of C – Data Types – Operator – Control Statements – Branching, Looping, Nested Control Structures – Strings - Strings Functions.

Unit – III Functions and Arrays **10 Hours**

Functions – Built in Functions – Types of Functions – Scope of Variables – Call by Values and call by reference- Recursion- Arrays – Passing Arrays to Functions – Multi-Dimensional Arrays – Strings Operations – Enumerated Data Types.

Unit – IV Structures and Union **7 Hours**

Structures –User Defined Data Types – Union - Nested Structure, Passing Structures to Functions.

Unit – V Pointers and Files **10 Hours**

Pointer Concept – Declaration – Accessing Variable through Pointer – Initializing Pointer Variable – Pointers and Functions – Pointers and Arrays – Pointers and Structures – Example Programs using Pointers with Function, Arrays and Structures – Command Line Arguments. File Handling - File Pointer – High Level File Operations – Opening and Closing of File – Creating, Processing and Updation on Files – Simple File Handling Programs.

Pedagogy

Class Room Lectures, Power point presentation, , Seminar, Quiz, Assignments

Text Books

1. Balagurusamy, E. (2012), *Programming in ANSI C*, Tata McGraw Hill Publishing Company, 6th Ed.

2. Sumitabha Das. UNIX Concepts and Applications. 4th Edition, New Delhi: Tata McGraw Hill, 2011.

Reference Books

1. Gottfried (2006*), Programming with C,Schaum's Outline Series*, Tata McGraw Hill.

2. Herbert Schildt, *The Complete Reference C*, MC Graw Hill Education, 4th Edition.

3. Yashavant P Kanetkar. Unix Shell Programming. New Delhi: BPB Publications, 2008.

E-Resources

1. https://www.tutorialspoint.com/cprogramming/c_useful_resources.htm
2. https://www.programiz.com/c-programming
3. https://www.javatpoint.com/linux-tutorial
4. https://www.youtube.com/watch?v=-CpG3oATGIs
5. https://www.learn-c.org/

Course Outcomes

At the end of the course, students would be able to:

CO1	Explain the Linux files systems, Linux Commands and process status.
CO2	Classify various Control structures and operators.
CO3	Explain Functions and Arrays.
CO4	Experiment structures and union.
CO5	Make use of pointers and Files in various programs.

Mapping Course Outcomes with Program Outcomes

COs/PSOs	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**	**PSO7**	**PSO8**	**PSO9**	**PSO10**	**PSO11**	**PSO12**
CO1	2	2	2	1	1	1	1	1	1	3	1	2
CO2	2	1	2	2	2	2	2	1	2	1	1	1
CO3	3	1	2	3	3	3	2	1	2	1	1	1
CO4	3	1	2	3	3	2	2	2	2	1	1	1
CO5	3	3	2	3	1	3	2	2	3	1	1	2

Articulation Mapping - K Levels with Course Outcomes (COs)

Units	**Cos**	**K – Level**	**Section A**		**Section B**	**Section C**
			MCQs		**Either/or Choice**	**Open Choice**
			No. of Questions	**K-Level**	**No. of Questions**	**No. of Questions**
1	CO1	Up to K2	2	K1 & K2	2(K1 & K1)	1(K1)
2	CO2	Up to K2	2	K1 & K2	2(K2 & K2)	1(K2)
3	CO3	Up to K3	2	K1 & K2	2(K3 & K3)	1(K3)
4	CO4	Up to K2	2	K1 & K2	2(K2 & K2)	1(K2)
5	CO5	Up to K3	2	K1 & K2	2(K3 & K3)	1(K3)
No of Questions to be asked			10		10	5
No of Questions to be answered			10		5	3
Marks for each Question			1		4	10
Total Marks for each Section			10		20	30

K1 – Remembering and recalling facts with specific answers

K2 – Basic understanding of facts and stating main ideas with general answers

K3 – Application oriented – Solving problems

Distribution of Section –wise Marks with K Levels

K Levels	**Section A (No Choice)**	**Section B (Either/or)**	**Section C (Open Choice)**	**Total Marks**	**% of Marks without choice**	**Consolidated (Rounded off)**
K1	5	8	10	23	23	23%
K2	5	16	20	41	41	41%
K3		16	20	36	36	36%
Total Marks	10	40	50	100	100	100%

Lesson Plan

Unit	Description	Hours	Mode
I **Introduction of Linux**	a)Structure and linux file system b)Linux Commands c)Standard I/O and Pipe line command d)Process	2 2 2 2	Descriptive method PPT Presentation Assignment
II **Introduction of C**	a) Elements of C, Data types b) Operator & I/O function in C c)Control and Looping Statements d)Strings	2 2 3 3	Descriptive method Quiz
III **Functions and Arrays**	a) Functions: Definition, prototype b) Parameters passing techniques& recursion c)Arrays & Types of Array d) by Values and call by reference	3 2 3 2	PPT Presentation Assignment Descriptive method
IV **Structures and Union**	a)Structures b)User defined data types c)Union d)Structure and Function	2 2 2 1	Descriptive method Assignment
V **Pointers and Files**	a)Pointer Concepts b)Pointers&Functions,Pointers&array c)File Concepts d)File Operations	2 3 2 3	Descriptive method Quiz PPT Presentation

Course designed by: Mr.N.Thambirajan

Programme	**B.Sc.(IT)**	**Programme Code**	**UIT**
Course Code	**20UITC1P**	**Number of Hours/Cycle**	**3**
Semester	**I**	**Max. Marks**	**100**
Part	**III**	**Credit**	**3**
Core Practical I			
Course Title	**Introduction to Programming-Lab**		
Cognitive Level	**Up to K3**		

Preamble

This Laboratory course will make possible students to know checking various conditions, looping and solve the problems. The course provides as an establishment laboratory for progress the problem solving skills of students.

List of Practicals

1. Sum of digits.
2. Armstrong or not.
3. Prime or not.
4. Fibonacci series.
5. To demonstrates redirection of standard output to a file .EX:df>f1.txt?
6. To emulate the Unix ls-l command?
7. Find the grade of a student using else if ladder.
8. String Handling function.
9. Add, subtract and multiply two matrices.
10. Generate student mark list using array of structures.
11. Build and process the student mark list using file.
12. Build and process inventory control using file.
13. Build and process electricity bill using file.
14. Study of Unix/Linux general purpose utility command (man, who,cat, cd, cp, ps, ls, mv, rm, mkdir, rmdir, echo, more, date, time, kill, history, chmod,chown, finger, pwd, cal, logout, shutdown)
15. Implement in C the following Unix commands using system calls
    A) cat B)mv

Course designed by: N.Thambirajan

Programme	B.Sc.(IT)	Programme Code	UIT
Course Code	20UITC1Q	Number of Hours/Cycle	3
Semester	I	Max. Marks	100
Part	III	Credit	3
Core Practical II			
Course Title	Multimedia Tools-Lab		
Cognitive Level	Up to K3		

Preamble

This course is designed to facilitate to understand, create and edit animation using multimedia tools and this understandability makes the students to be a successful Graphics designer.

PHOTOSHOP:

1.Create a College ID Card by using appropriate tools in Photoshop.
2.Design a photo frame using custom shapes in Photoshop.
3. Explain the procedure to Creating a Cover Page for a text book.
4.Design a Logo for Coffee shop.
5.Design a Movie Poster with Texture Background using Photoshop.
6. Design an image by applying text masking effect.
7. Design an image by apply rainbow effect, blur effect, Lighting effect Filter.
8. Explain the steps for Designing a Passport Size Photo on a Max Size Paper
9. Removing facial blemishes/mole
10. Convert the given image to a pencil sketch.

FLASH:

1.To create an animation to represent the growing moon.
2. To create an animation to indicate a ball bouncing on steps.
3.Using flash, show the gradual conversion of a square to a circle.
4. Using flash, highlight a neatly formatted text by a spotlight from left to right
5.Write action script to play and stop an animation.

INKSCAPE

1. Create artistic text and apply a Drop Shadow and adjust the Settings using inkscape
2. Create a Label using inkscape software.
3. To create a invitation using inkscape
4. To create 3d text format in inkscape.
5. To create 3d chair model in inkscape.

Course designed by:S.Vijayalakshmi

Programme	B.Sc.(IT)	Programme Code	UIT
Course Code	20UITN11	Number of Hours/Cycle	2
Semester	I	Max. Marks	100
Part	IV	Credit	2
Non Major Elective Course I			
Course Title	Fundamentals of Information Technology		
Cognitive Level	Up to K3		

Preamble

This course aims at smooth the progress of the students to understand basic computer functional components and gain the knowledge about Internet and world wide web.

Unit I Introduction to Computers **4 Hours**

Definition - Characteristics of a Computer - Applications / Uses of Computers - Classification of Digital Computer Systems : Microcomputer, Minicomputer, Mainframe and Supercomputer - Anatomy of the Computer.

Unit II Central Processing Unit **6 Hours**

Introduction - CPU - Memory - Random Access Memory(RAM) - Read Only Memory(ROM) -Registers - Factors affecting processor speed - Instruction Set - Machine Cycle - Working of CPU and Memory.

Unit III Input Devices and Output Devices **7 Hours**

Introduction - Keyboard - Mouse - Trackball - Game Controllers - Scanners - Barcode Reader - Optical Character Recognition(OCR) - Digitizer - Voice Recognition - Web Cams - Digital Camera - Video Cameras - Monitor - Printer - Plotter.

Unit IV Computer Software: **5 Hours**

Introduction - What is computer Software? Hardware/ Software interaction - Software Categories - Classification of Software - Operating systems – Utilities – Compilers and Interpreters.

Unit V Telecommunication and Networks: **8 Hours**

Introduction - Types of Networks - Network Topologies - Network Protocols - Network Architecture. – Network Standardization - Internet and WWW: Introduction - Evolution of Internet - What can I do in the Internet? - Internet Addressing - WWW - web pages and HTML - Web Browsers - Searching the web.

Pedagogy

Class Room Lectures, Power point presentation, Seminar, Quiz, Assignments

Text Book

1. Alexis leon & Mathews leon(2008), *Fundamentals of Information Technology*,Vikas publication,
2nd edition.

Reference Books

1. Durgesh pant and Magesh kumar Sharma,(2008), *Fundamentals of Information Technology*, Lakshmi publications, 2nd edition.
2. Rajaraman V.,(2013*), Introduction To Information Technology*, PHI Learning limited.
3.Vaishali Sharma, *The essentials of information technology*,Dhanpat Rai publishing Company.

E-Reources

1.https://www.youtube.com/watch?v=awLnur5Yt9o
2.https://www.tutorialspoint.com/computer_fundamentals/index.htm
3.https://www.javatpoint.com/computer-fundamentals-tutorial
4.https://www.tutorialspoint.com/fundamentals_science_and_technology/information_technology.htm
5. https://www.youtube.com/watch?

Course Outcomes

At the end of the course, students would be able to:

No.	Course Outcome
CO1	Relate the basics of computer system, its architecture
CO2	Describe the Central Processing Unit and Memory.
CO3	Classify the various Input and Output Devices
CO4	Explain about Computer software and its type.
CO5	Make use of Internet and Build the Web documents.

Articulation Mapping - K Levels with Course Outcomes (COs)

Units	Cos	K – Level	Section A	Section B
			Either/or Choice	Open Choice
			No. of Questions	No. of Questions
1	CO1	Up to K1	2(K1 & K1)	1(K1)
2	CO2	Up to K2	2(K2 & K2)	1(K1)
3	CO3	Up to K2	2(K1 & K1)	1(K2)
4	CO4	Up to K2	2(K2 & K2)	1(K2)
5	CO5	Up to K3	2(K3 & K3)	1(K3)
No of Questions to be asked			10	5
No of Questions to be answered			5	3
Marks for each Question			3	5
Total Marks for each Section			15	15

K1 – Remembering and recalling facts with specific answers

K2 – Basic understanding of facts and stating main ideas with general answers

K3 – Application oriented – Solving problems

Distribution of Section –wise Marks with K Levels

K Levels	Section A (Either/Or)	Section B (Open choice)	Total Marks	% of Marks without choice	Consolidated (Rounded off)
K1	12	10	22	40%	40%
K2	12	10	22	40%	40%
K3	6	5	11	20%	20%
Total Marks	30	25	55	100%	100%

Lesson Plan

Unit	Description	Hours	Mode
I **Introduction to Computers**	a)Definition, Characteristics of a Computer Applications / Uses of Computers b).Classification of Digital Computer Systems Microcomputer, Minicomputer, Mainframe and Supercomputer, Anatomy of the Computer.	1 3	Descriptive Method PPT Presentation Assignment
II **Central Processing Unit**	a)Introduction to CPU, Memory, Random Access Memory(RAM), Read Only Memory(ROM) b)Registers, Factors affecting processor speed c)Instruction Set - Machine Cycle, .Working of CPU and Memory.	2 2 2	Descriptive Method PPT Presentation Assignment
III **Input Devices and Output Devices**	a)Introduction, Keyboard , Mouse, Trackball, Game Controllers b)Scanners, Barcode Reader, Optical Character Recognition(OCR) c) Digitizer, Voice Recognition, Web Cams, Digital Camera, Video Cameras d) Monitor, Printer, Plotter.	1 2 2 2	Descriptive Method PPT Presentation Assignment
IV **Computer Software**	a)Introduction, What is computer Software? Hardware/ Software interaction b)Software Categories, Classification of Software Operating systems, Utilities, Compilers and Interpreters	2 3	Descriptive Method PPT Presentation Assignment
V **Telecommunication and Networks**	**a)**Introduction, Types of Networks, Network Topologies Network Protocols b)Network Architecture., Network Standardization c) Internet and WWW: Introduction, Evolution of Internet, What can I do in the Internet? d) Internet Addressing, WWW, web pages and HTML, Web Browsers, Searching the web.	3 1 2 2	Descriptive Method PPT Presentation Assignment

Course designed by : S.Vijayalakshmi

Programme	**B.Sc.(IT)**	**Programme Code**	**UIT**
Course Code	**20UITC21**	**Number of Hours/Cycle**	**4**
Semester	**II**	**Max. Marks**	**100**
Part	**III**	**Credit**	**3**
Core Course II			
Course Title	**Programming in C#.NET**		
Cognitive Level	**Up to K3**		

Preamble

The course helps the students to master all procedure of software development in C#
Programming Language and to demonstrate these techniques by implementing the solution for variety of problems.

Unit I: Overview of .Net Framework 9 Hours

.NET Features –The Common Language Runtime (CLR) –The .NET Framework class Library –The Common Type System –Visual Studio .NET IDE 2005.Windows Forms: Window Forms Fundamentals –Windows MDI Forms –Creating Dialog boxes –Adding Controls to Forms –Handling Events.

Unit II:Decision Making Branching, Looping 9 Hours

Decision Making and Branching –Decision making and Looping, Methods in C#, Handling array, Structures and Enumerations.

Unit III: Classes and Objects, Inheritance, Interface 8 Hours

Class and Objects-Inheritance and Polymorphism-Interfaces-Operator Overloading.

Unit IV: Windows Control 9 Hours

Category 1:the control class –Text boxes –Rich Text Boxes –Labels –Buttons. Category 2:Checkboxes –Radio Button –List Boxes –Combo boxes. Category 3:Picture Boxes –Scroll Bars –Timers.

Unit V:File Handling and User Controls 10 Hours

Advanced Windows Programming: Graphics Handing, File Handling: The File stream Class –Using stream Writer class, Binary Writer class, Binary Reader class. User Controls: Creating User Controls, Adding properties, methods, events, Using the Scrollable Control Class, Container Control class, Using System, Windows, Forms, User Control class.

Text Books

1.J.G.R. Sathiaseelan, N. Sasikaladevi, (2009), *Programming with C#.NET*, PHI Learning Private Limited, New Delhi.
2. E. Balagurusamy, Reprint (2010), *Programming in C# a primer*.

Reference Books

1. Herbert Schildt(2004), *"The Complete Reference: C#",* Tata McGraw Hill Publications,.
2. E. Balagurusamy(2009), *"Programming in C#",* Tata Mc-GrawHill Publications, 2nd Edition.
3.J. G. R. Sathiaseelan and N. Sasikaladevi(2009), *"Programming with C#.Net*", Pearson Education,1st Edition,.

Pedagogy

Class Room Lectures, Power point presentation, Experience Sharing, Brain storming, Activity

E-Resources

1.www.w3schools.com/html
2.https://www.tutorialspoint.com/html/html_basic_tags.htm
3.https://developer.mozilla.org/en-US/docs/Learn/Getting_started_with_the_web/HTML_basics

Course Outcomes

At the end of the course, students would be able to:

No	Course Outcome
CO1	Depicts the basic concepts of .net frame work and specify the CLR with it‘s features.
CO2	Describes the C#.Net with Object Oriented View , it‘s various loops, and decision making
CO3	Interpret Inheritance, Polymorphism, Interfaces and Operator overloading
CO4	Discuss the various tools on window controls illustrative applications.
CO5	Handle file, graphics features of .Net and explain how to create user control.

Mapping Course Outcomes with Program Outcomes

COs/PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	PSO11	PSO12
CO1	2	2	2	1	1	2	1	1	1	3	1	1
CO2	2	2	2	2	2	3	1	2	1	2	1	2
CO3	3	2	2	2	2	3	3	2	1	2	1	2
CO4	3	2	3	2	1	3	3	3	3	3	1	3
CO5	3	3	3	3	2	3	3	3	3	3	1	3

Articulation Mapping - K Levels with Course Outcomes (COs)

Units	Cos	K – Level	Section A		Section B	Section C
			MCQs		Either/or Choice	Open Choice
			No. of Questions	K-Level	No. of Questions	No. of Questions
1	CO1	Up to K2	2	K1 & k2	2(K1 & K1)	1(K1)
2	CO2	Up to K2	2	K1 & k2	2(K2 & K2)	1(K2)
3	CO3	Up to K3	2	K1 & k2	2(K2 & K2)	1(K2)
4	CO4	Up to K3	2	K1 & k2	2(K3 & K3)	1(K3)
5	CO5	Up to K3	2	K1 & k2	2(K3 & K3)	1(K3)
No of Questions to be asked			10		10	5
No of Questions to be answered			10		5	3
Marks for each Question			1		4	30
Total Marks for each Section			10		20	30

K1 – Remembering and recalling facts with specific answers

K2 – Basic understanding of facts and stating main ideas with general answers

K3 – Application oriented – Solving problems

Distribution of Section –wise Marks with K Levels

K Levels	Section A (No Choice)	Section B (Either/or)	Section C (Open Choice)	Total Marks	% of Marks without choice	Consolidated (Rounded off)
K1	5	8	10	23	23%	23%
K2	5	16	20	41	41%	41%
K3		16	20	36	36%	36%
Total Marks	10	40	50	100	100%	100%

Lesson Plan

Unit	Description	Hours	Mode
I **Overview of .Net Framework**	a) .NET Features-The Common Language Runtime (CLR) b) The .NET Framework class Library-The Common Type System – Visual Studio .NET IDE2005. c) Window Forms Fundamentals-Windows MDI Forms – Creating Dialog boxes d) Adding Controls to Forms – Handling Events.	2 2 2 3	Descriptive Method PPT Presentation Assignment
II **Decision Making and Branching, Looping, Array**	a) Decision Making and Branching – Decision making and Looping. b) Methods in C#, Handling array- Structures and Enumerations	5 4	Descriptive Method Quiz
III **Classes and Objects, Inheritance, Interface**	a) Class and Objects. b) Inheritance and Polymorphism c) Interfaces d) Operator Overloading.	2 2 2 2	Descriptive Method PPT Presentation Quiz
IV **Windows controls**	a) Category 1: the control class – Text boxes – Rich Text Boxes – Labels – Buttons. b) Category 2: Checkboxes – Radio Button – List Boxes – Combo boxes. c) Category 3: Picture Boxes – Scroll Bars – Timers.	3 3 3	Descriptive Method PPT Presentation Assignment
V **File Handling and User Controls**	a) Graphics Handing - The File stream Class – Using stream Writer class. b)Binary Writer class, Binary Reader class – Creating User Controls, Adding properties, methods, events c)Using the Scrollable Control Class, Container Control class, Using System ,Windows, Forms, User Control class.	3 3 4	Descriptive Method PPT Presentation Assignment

Course designed by: Mr.N.Veeramani

Programme	B.Sc.(IT)	Programme Code	UIT
Course Code	20UITC2P	Number of Hours/Cycle	3
Semester	II	Max. Marks	100
Part	III	Credit	3
Core Practical III			
Course Title	Programming in C#.NET-Lab		
Cognitive Level	Up to K3		

Preamble

This course provides the basic concepts of object oriented programming and trains the students to create object oriented programs.

Program List:

1.Develop a Console application to check whether the given number is odd or even.
2.Develop a Console application to implement method over loading.
3.Develop a Console application for constructor over loading.
4.Develop a Console application to count number of positives, negatives and zeros in an array
5.Develop a Console application for Matrix Addition.
6.Create a windows application that allows the user to enter a number in the text box named ‗getnum'. Check ‗getnum' is palindrome or not print the result in a label when the user clicks on a button.
7.Create a windows application which will ask the user to input his/her name and a message, display the two items concatenated in a label and change the format of the label using radio buttons and check boxes for selection, the user can make the labels' test bold, underlined or italic and change it's color. Include buttons to display the message in the label, clear the text boxes & label & exit.
8.Create a windows application which generates Fibonacci series in to a list box.
9.Create a windows application to add and delete items to and from the combo box.
10.Create a windows application to generate even numbers and odd numbers in separate list boxes.
11.Create a windows application for property implementation.
12.Create a windows application to set font style and font color using check boxes and radio buttons.

Course designed by :Mr.N.Veeramani

Programme	**B.Sc.(IT)**	**Programme Code**	**UIT**
Course Code	**20UITC2Q**	**Number of Hours/Cycle**	**3**
Semester	**II**	**Max. Marks**	**100**
Part	**III**	**Credit**	**3**
Core Course Practical IV			
Course	**HTML & CSS-Lab**		
Cognitive	**Up to K3**		

Preamble

This course is designed to facilitate to understand, create and edit animation using HTML and CSS . This understandability makes the students to be a successful Web designer.

HTML4

1. Program to describe various text formatting commands.
2. Program to create an Unordered list and ordered list.
3. Program to create a Table.
4. Program to create a simple form.
5. Program to insert scrolling text using Marquee tag.
6. Program to divide a page into Frames.
7. Program to create a simple layout of Webpage.

CSS2

1. Creating Horizontal menu using CSS.
2. Creating a Webpage Layout using CSS.

CSS3

1. To create box-shadow and border-radius .
2. Design multiple backgrounds .
3. To create text-shadow .
4. Create the Transition effect .
5. Develope the 3d rotation object .
6. To Animate the object .

Course designed by: S.Ameena Banu

Programme	B.Sc.(IT)	Programme Code	UIT
Course Code	20UITN21	Number of Hours/Cycle	2
Semester	II	Max. Marks	100
Part	IV	Credit	2
Non Major Elective Course II			
Course Title	E-Commerce		
Cognitive Level	Up to K3		

Preamble

This Course provides the basic concept of E-Commerce application and make the students for getting employment in government and private sector.

Unit I Basic concepts of E-Commerce 6 Hours

Introduction - Electronic commerce framework - Anatomy of E-Commerce application -Electronic Commerce Organization Applications - The Network Infrastructure for Electronic commerce - The Internet as a Network Infrastructure.

Unit II Electronic Commerce and World Wide Web 5 Hours

The Business of Internet Commercialization - Electronic Commerce and World Wide Web –Consumer - Oriented Electronic Commerce.

Unit III Electronic Data Interchange 5 Hours

Electronic Payment Systems-Electronic Data Interchange - EDI implementation - MIME and Value Added Networks.

Unit IV Marketing with Digital Library 6 Hours

Inter Organizational Electronic Commerce - The Corporate Digital Library - Advertising and Marketing on the internet.

Unit V Digital copyrights 8 Hours

Consumer Search and Resource Discovery - On-Demand Education and Digital Copyrights -Software Agents.

Pedagogy

Powerpoint presentation, Youtube videos, Course material

Text Book

1.Venkatachalam,A.,and Jeyapragash,A.,(2001),*E-commerce Made Simple*, A.M.Publications.

Reference Book(s)

1. Jeffrey F.,Rayport and Bernard J., and Jaworski, *Introduction to E-Commerce*, Tata Mc-Graw Hill,2nd Edition.
2. Reenstein,(2000), *Electronic Commerce*, Tata Mc-Graw Hill Pvt., Ltd.,
3. Bharat Bhaskar,(2003), *Electronic Commerce* , Tata MC- Graw Hill, New Delhi.

E- Resources

1.www.cloudsway.com
2.www.ekm.com
3.https://www.up.com/suppliers/order_inv/edi/what_is_edi/#:~:text=Electronic%20Data%20Interchange%20(EDI)%20is,electronically%20are%20called%20trading%20partners
4. http://repo.uum.edu.my/2310/1/syed_salim-pwork.pdf
5. https://www.locklizard.com/ipr-protection/

Course Outcomes

At the end of the course, students would be able to:

No	Course Outcome
CO1	State the basic concepts of E-commerce
CO2	Explain the E business Strategies
CO3	Develop the payment system
CO4	Develop selling and marketing on web
CO5	Construct E business model

Articulation Mapping - K Levels with Course Outcomes (COs)

Units	Cos	K – Level	Section A	Section B
			Either/Or	Open Choice
			No. of Question	No. of Question
1	CO1	Up to K1	2(K1 & K1)	1(K1)
2	CO2	Up to K2	2(K2 & K2)	1(K2)
3	CO3	Up to K2	2(K1 & K1)	1(K2)
4	CO4	Up to K2	2(K2 & K2)	1(K2)
5	CO5	Up to K3	2(K3 & K3)	1(K3)
No of Questions to be asked			5	5
No of Questions to be answered			5	3
Marks for each Question			3	5
Total Marks for each Section			15	15

K1 – Remembering and recalling facts with specific answers
K2 – Basic understanding of facts and stating main ideas with general answers
K3 – Application oriented – Solving problems

Distribution of Section –wise Marks with K Levels

K Levels	Section A (Either/or)	Section B (Open Choice)	Total Marks	% of Marks without choice	Consolidated (Rounded off)
K1	12	5	17	31	31%
K2	12	15	27	49	49%
K3	6	5	11	20	20%
Total Marks	30	25	55	100	100%

Lesson Plan

Unit	Description	Hours	Mode
I **Basic concepts of E-Commerce**	a)Introduction - Electronic commerce framework b)Anatomy of E-Commerce application c)Electronic Commerce Organization Applications d)The Network Infrastructure for Electronic commerce e)The Internet as a Network Infrastructure.	1 1 2 1 1	Descriptive method PPT Presentation
II **Electronic Commerce and World Wide Web**	a) The Business of Internet Commercialization b)Electronic Commerce and World Wide Web c)Consumer – Oriented Electronic Commerce.	1 2 2	Descriptive method Quiz
III **Electronic Data Interchange**	a)Electronic Payment Systems b)Electronic Data Interchange c)EDI implementation d)MIME and Value Added Networks.	2 1 1 1	PPT Presentation Assignment Descriptive method
IV **Marketing with Digital Library**	a)Inter Organizational Electronic Commerce b)The Corporate Digital Library c)Advertising and Marketing on the internet.	2 2 2	Descriptive method Assignment
V **Digital copyrights**	a)Consumer Search and Resource Discovery b)On-Demand Education and Digital Copyrights c)Software Agents.	2 2 2	Descriptive method Quiz PPT Presentation

Course designed by: S.AmeenaBanu

Programme	B.Sc.(IT)	Programme Code	UIT		
Course Code	20UITC31	Number of Hours/Cycle	4		
Semester	III	Max. Marks	100		
Part	III	Credit	4		
Core Course III					
Course Title	Database Management System Concepts		L	T	P
Cognitive Level		Up to K3	55	5	-

Preamble

This course provides the student a well-built foundation on Database concepts. It also introduced the concepts related to information system in organizational usage.

Unit I	**Introduction to Databases**	**9 Hours**
	Introduction: Database system Applications-Purpose of database system-View of data-Database languages- Database Design-Database and Application Architecture-Database Users and Administrators. **Introduction to Relational Model:** Structure of Relational Databases-Database Schema- Keys-Schema Diagram- Relational Query Language- The Relational Algebra.	
Unit II	**Structured Query Language**	**10 Hours**
	Introduction to SQL: Overview of the SQL Query Language-SQL Data Definition- Basic Structure of SQL Queries- Additional Basic operations-Set Operations-Aggregate Functions-Nested sub queries. **Intermediate SQL:** Join Expressions-Views-Transactions-Integrity constraints. **Advanced SQL:** Functions and procedures-Triggers	
Unit III	**Database Design**	**14 Hours**
	Database design using the E-R model: Overview of Design Process-Entity Relational Model- Complex Attributes-Mapping Cardinalities- Primary Keys-Entity-Relationship Design Issues. **Relational Database design:** Features of good relational database designs-Decomposition of functional dependencies-Normal forms-More Normal forms.	
Unit IV	**Storage Management and Indexing**	**11 Hours**
	Physical Storage System: Overview of Physical Storage Media-Storage Interfaces- Magnetic Disks- Flash Memory- RAID. **Data Storage Structures:** Database Storage Architecture- File Organization-Organization of records in Files- Data-Dictionary Storage. **Indexing:** Basic concepts- Ordered Indices-B+-Tree Index Files- Hash Indices.	
Unit V	**Transaction Management**	**11 Hours**
	Transactions: Transaction Concepts- A simple Transaction Model- Storage Structure- Transaction Atomicity and Durability-Transaction Isolation- Serializability. **Concurrency control:** Lock based Protocol- Deadlock Handling-Multiple Granularity-Insert Operations, Delete Operations and predicate Reads. **Recovery System:** Failure classification-Storage, Recovery and Atomicity-Recovery Algorithm-Buffer management.	

Pedagogy

Class Room Lectures, Power point Presentation, Brain storming Activity.

Text Book

1.A Silberschatz, H Korth, S Sudarshan,(2020), "*Database System and Concepts*", 7th Edition,McGraw-Hill.

Reference Books

1.Rob, Coronel,(2006), "*Database Systems*",7th Edition, Cengage Learning.

2. Ragu Ramakrishnan,(2002), "*Database Management System* ",3rdEdition, McGraw-Hill,.

3.H G Molina, J Widom, J D Ullman,(2009), " *Database Systems The Complete Book* ",4th Edition, Pearson Edition.

E-Resources

- .http://www.w3schools.com/sql/default.asp
- .http://www.codeacademy.com/learn/learn-sql
- .http://www.learnsql.com
- .http://www.tutorialpoints.com/sql/index.html
- .http://www.udacity.com/course/intro-to-relational-databases--ud197
-

Course Outcomes

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

CO1	Understand the basic Database concepts and its Architecture.
CO2	Experiment with various SQL Queries.
CO3	Make use of Database Models.
CO4	Identify various Storage Management and Indexing.
CO5	Utilize various Transaction Management, Concurrency Control and Recovery System.

Mapping of Course Outcomes (COs) with Programme Specific Outcomes

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11	PSO 12
CO1	3	1	2	0	3	1	1	1	1	1	1	2
CO2	3	2	2	3	3	3	3	2	1	1	1	3
CO3	3	1	3	2	3	2	2	2	1	1	1	3
CO4	3	2	2	3	3	2	2	2	1	1	1	2
CO5	3	1	2	2	3	2	3	2	1	1	1	3

3. High; 2. Moderate ; 1. Low

Articulation Mapping - K Levels with Course Outcomes (COs)

Units	COs	K-Level	Section A		Section B	Section C
			MCQs		Either/ or Choice	Open Choice
			No. of Questions	K-Level	No. of Question	No. Of Question
1	CO1	Up to K1	2	K1&K1	2(K1&K1)	1(K1)
2	CO2	Up to K3	2	K1&K2	2(K3&K3)	1(K3)
3	CO3	Up to K2	2	K1&K2	2(K2&K2)	1(K2)
4	CO4	Up to K2	2	K1&K1	2(K1&K1)	1(K2)
5	CO5	Up to K3	2	K1&K2	2(K2&K2)	1(K3)
No of Questions to be asked			10		10	5
No of Questions to be answered			10		5	3
Marks for each Question			1		4	10
Total marks for each Section			10		20	30

K1 – Remembering and recalling facts with specific answers
K2 – Basic understanding of facts and stating main ideas with general answer
K3 – Application oriented – Solving problems

Distribution of Section - wise Marks with K Levels

K Levels	Section A (No Choice)	Section B (Either/or)	Section C (Open Choice)	Total Marks	% of Marks without Choice	Consolidated (Rounded off)
K1	7	16	10	33	33	33%
K2	3	16	20	39	39	39%
K3		8	20	28	28	28%
Total Marks	10	40	50	100	100	100%

Lesson Plan

Unit I	**Introduction to Databases**	**9 Hours**	**Mode**
	a. Database system and purpose of database system	1	Descriptive method PPT presentation
	b. View of Data, Database Language, Database Design	2	
	c. Database and Application Architecture, Database Users and Administrators	2	
	d. Structure of Relational Databases, database Schema, Keys	1	
	e. Schema Diagram, Relational Query Language, The Relational Algebra	3	
Unit II	**Structured Query Language**	**10 Hours**	**Mode**
	a. Introduction to SQL	1	Descriptive method
	b. Set Operations, Null values, Aggregate functions	2	
	c. Nested sub queries, Modification of Databases	2	
	d. Intermediate SQL	2	
	e. Advanced SQL	3	
Unit III	**Database design**	**14 Hours**	**Mode**
	a. Database design using E-R model.	3	PPT presentation Descriptive method
	b. Complex Attributes ,Mapping Cardinalities, Primary Keys	3	
	c. Entity Relationship design issues.	2	
	d. Relational Database design	3	
	e. Normal forms	3	
Unit IV	**Storage Management and Indexing**	**11 Hours**	**Mode**
	a. Physical Storage System	2	Descriptive method
	b. RAID levels	3	
	c. Data storage Structure	2	
	d. Indexing	2	
	e. Hash Indices.	2	
Unit V	**Transaction management**	**11 Hours**	**Mode**
	a. Transaction management	2	PPT presentation Descriptive method
	b. Transaction Atomicity and Durability, Transaction Isolation, Serializability	3	
	c. concurrency control	2	
	d. Insert Operations, Delete Operations and predicate Reads.	2	
	e. Recovery System	2	

Course designed by: Mrs. P. Chandrakala

Programme	**B.Sc.(IT)**	**Programme Code**		**UIT**	
Course Code	**20UITC3P**	Number of Hours/Cycle		**4**	
Semester	**III**	Max. Marks		**100**	
Part	**III**	**Credit**		**3**	
Core Practical V					
Course Title	**Relational Database Management System -Lab**		**L**	**T**	**P**
Cognitive Level	**Up to K3**		**-**	**-**	**60**

Preamble

This Laboratory course will make students to check various SQL Queries and PL/SQL Queries to solve the problems. The course provides as an establishment laboratory for progress the problem solving skills of students.

Program List:

1. DDL statements and simple queries.
2. DML statements and simple queries.
3. Queries using
   - i. WHERE clause, HAVING clause, LIKE operator, BETWEEN clause.
   - ii. logical operators.
   - iii. Set operators.
   - iv. Sorting and grouping.
4. Nested queries using SOL
   - i. Sub queries.
   - ii. Join operators.
5. Built – in functions (string functions, character functions, date functions, conversion functions, and aggregate functions).
6. Use of indexes, creating views and querying in views.
7. PL/SQL block to find factorial of a given number
8. PL/SQL block to generate Fibonacci series
9. Functions.
10. Procedures.
11. Cursors.
12. Triggers.
13. Exceptions.

Course designed by: **Mrs. P. Chandrakala**

Programme	**B.Sc.(IT)**	**Programme Code**		**UIT**	
Course Code	**20UITC32**	Number of Hours/Cycle		**4**	
Semester	**III**	Max. Marks		**100**	
Part	**III**	**Credit**		**4**	
Core Course IV					
Course Title	**Data Structures and Computer Algorithms**		**L**	**T**	**P**
Cognitive Level		**Up to K3**	**55**	**5**	**-**

Preamble

This course provides an introduction to the basic concepts of linear and non linear data structures and develops algorithms to solve real world problems.

Unit I	**Arrays and Linked List**	**10 Hours**
	Introduction to data structure: Definitions-Data Structures-Arrays: one dimensional array-two dimensional array-special types of matrices.**Linked Lists**: Introduction –benefits and limitations of linked list-Types-singly linked lists-circular linked lists-doubly linked lists.	
Unit II	**Stack and Queues**	**11 Hours**
	Stack: Introduction-ADT stack-implementation of stack-application of stack. **Queue:** Introduction- implementation of basic operations on array based and linked list based queue- circular queues.	
Unit III	**Trees**	**10 Hours**
	Trees: Introduction- binary trees-representation of binary trees-binary tree traversals- recursive procedures of traversal methods-Expression trees- Threaded trees- Application of trees.	
Unit IV	**Divide and Conquer**	**13 Hours**
	Algorithms: What is an Algorithm?-Algorithm Specification-Performance analysis.**Divide and Conquer**: General method-Binary search- Finding the maximum and minimum-merge sort-quick sort- selection- Strassen's matrix multiplication.	
Unit V	**Greedy Method**	**11 Hours**
	The Greedy Method: General method – knapsack problem-Job Sequencing with deadlines-Minimum cost spanning trees: Prim's algorithm- kruskal algorithm-Optimal Storage on tapes-optimal merge patterns-single source shortest path.	

Pedagogy

Class Room Lectures, Power point Presentation, Brain Storming Activity.

Text Book

1. Chitra.A and Rajan.P.T, (2006), *"Data Structures*", Vijay Nicol Imprints Pvt Ltd.
2. Ellis Horrowitz and Sarataj Sahni," *Fundamentals of Computer Algorithms*", New Delhi, Golgotha Publications Pvt Ltd.

Reference Books

1. Mark Allen Weiss, (1997), "*Data Structure and Algorithm Analysis in C"* ,Second Edition, Addition Wesley publishing company.

2. Subramanyam . P.S , (2013), *"C and C++ Programming concepts and Data Structures"* , BS Publications.
3. Alfred V.Aho,John E. Hopcraft and Jeffrey D.Ullman, (2013*), " Data Structures and Algorithms"*, (Fourteenth Impression), Person Education.

E-Resources

- http://www.geeksforgeeks.org/data-structures/
- http://www.tutorialpoints.com/Data Structures & Algorithm\
- http://www.programiz.com/dsa
- http://www.w3schools.in/data-structures-tutorial/
- http://www.courseera.org/learn/data-structures/

Course Outcomes

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

CO1	Understand basic data structures such as arrays and linked list.
CO2	Explain the concept of stacks and queues.
CO3	Build trees based on our Application.
CO4	Understand the various algorithm design techniques and strategies
CO5	Apply the right strategy for solving a problem

Mapping of Course Outcomes (COs) with Programme Specific Outcomes

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11	PSO 12
CO1	3	1	2	2	1	3	1	1	1	1	1	3
CO2	3	1	2	2	2	3	2	1	1	1	1	2
CO3	3	1	3	3	1	3	3	1	1	1	1	3
CO4	3	3	2	2	3	3	2	1	1	1	1	2
CO5	3	1	3	2	1	3	3	1	1	1	1	3

3. High; 2. Moderate ; 1. Low

Articulation Mapping - K Levels with Course Outcomes (COs)

Units	**COs**	**K-Level**	**Section A**		**Section B**	**Section C**
			MCQ		**Either/ or Choice**	**Open Choice**
			No. of Questions	**K-Level**	**No. of Question**	**No. Of Question**
1	CO1	Up to K2	2	K1&K1	2(K1&K1)	1(K1)
2	CO2	Up to K2	2	K1&K1	2(K2&K2)	1(K2)
3	CO3	Up to K3	2	K1&K2	2(K2&K2)	1(K2)
4	CO4	Up to K3	2	K1&K2	2(K3&K3)	1(K3)
5	CO5	Up to K3	2	K1&K2	2(K3&K3)	1(K3)
No of Questions to be asked			10		10	5
No of Questions to be answered			10		5	3
Marks for each Question			1		4	10
Total marks for each Section			10		20	30

K1 – Remembering and recalling facts with specific answers
K2 – Basic understanding of facts and stating main ideas with general answer
K3 – Application oriented – Solving problems

Distribution of Section - wise Marks with K Levels

K Levels	Section A (No Choice)	Section B (Either/or)	Section C (Open Choice)	Total Marks	% of Marks without Choice	Consolidated (Rounded off)
K1	7	8	10	25	25%	25%
K2	3	16	20	39	39%	39%
K3		16	20	36	36%	36%
Total Marks	10	40	50	100	100%	100%

Lesson Plan

Unit I	**Arrays and Linked List**	**10 Hours**	**Mode**
	a. Definitions, Data Structures	2	Descriptive method PPT presentation
	b. Arrays: one dimensional array, Two dimensional array, special types of matrices	2	
	c. Linked Lists: Introduction ,benefits and limitations of linked list,	3	
	d. singly linked lists, circular linked lists, doubly linked lists	3	
Unit II	**Stack and Queues**	**11 Hours**	**Mode**
	a. Stack :Introduction, ADT stack, implementation of stack, application of stack	5	Descriptive method
	b. Queue: Introduction, implementation of basic operations on array based and linked list based queue	4	
	c. circular queues	2	
Unit III	**Trees**	**10 Hours**	**Mode**
	a. Trees: Introduction, binary trees	2	PPT presentation Descriptive method
	b. Representation of binary trees, binary tree traversals, recursive procedures of traversal	4	
	c. Expression trees, Threaded trees, Application of trees.	4	
Unit IV	**Divide and Conquer**	**13 Hours**	**Mode**
	a. Algorithms: Introduction, What is an Algorithm? Algorithm Specification, Performance analysis	3	Descriptive method
	b. Divide and Conquer: General method-Binary search- Finding the maximum and minimum	5	
	c. merge sort, quick sort, selection, Strassen's matrix multiplication	5	
Unit V	**Greedy Method**	**11 Hours**	**Mode**
	a. The Greedy Method: General method, knapsack problem, Job Sequencing with deadlines	3	PPT presentation Descriptive method
	b. Minimum cost spanning trees: Prim's algorithm, kruskal algorithm	4	
	c. Optimal Storage on tapes, optimal merge patterns, single source shortest path	4	

Course designed by: P. Murugeswari

Programme	**B.Sc.(IT)**	**Programme Code**	**UIT**
Course Code	**20UITS3P**	Number of Hours/Cycle	**2**
Semester	**III**	Max. Marks	**50**
Part	**III**	**Credit**	**2**
Sill Based Practical I			
Course Title	**JavaScript-Lab**		
Cognitive Level		**Up to K4**	

Preamble

This course is designed to understand the dynamic language and develop basic programming skills using JavaScript.

Program List

1.Write a JavaScript program to display the current day and time in the following format.
Sample Output : Today is : Tuesday.
Current time is : 10 PM : 30 : 38
2. Write a JavaScript program to find the largest of three given integers.
3. Write a JavaScript program to reverse a given Number.
4. Write a JavaScript program to searching a string in a given array
5. Write a JavaScript program to sort a string in alphabetical order.
6. Write a JavaScript program to set the background color of a paragraph.
7. Write a JavaScript program to count and display the items of a dropdown list, in an alert window.
8. Write a JavaScript to design a simple calculator
9. Create a Registration Form using Java Script.
10. Program to write a coding to prepare EB-Bill.
11. Program to write a coding to handle Mouse Listener.
12.Program in JavaScript to illustrate events.
13. Programs implementing JavaScript objects
14. Programs to handle exceptions

Course designed by:P.Murugeswari

Programme	**B.Sc.(IT)**	**Programme Code**			**UIT**
Course Code	**20UITC41**	Number of Hours/Cycle			**4**
Semester	**IV**	Max. Marks			**100**
Part	**III**	**Credit**			**3**
Core Course V					
Course Title	**Advanced Java Programming**		**L**	**T**	**P**
Cognitive Level		**Up to K3**	**55**	**5**	**-**

Preamble

To understand the concepts of object-oriented, GUI based application development, Database Connectivity and develop skills in using these paradigms using Java.

Unit I	**Java Basics**	**9 Hours**
	Introduction to Java: Introduction - History of java-Features of Java-Javatokens-keywords-Identifiers-Constants-DataTypes-Operators-Control Statements and Looping Structures-Classes and Objects-Exploring Methods and Inheritance.	
Unit II	**Packages and String Function**	**9 Hours**
	Packages and Interface-User defined packages- How to create a Packages?-Class Member Access Protection-Class Path-Introduction to Interface-Creating an interface- Extending Interface. **String, Array and Vector**- Introduction to String-String Functions-Arrays- Types of Array-Array of Objects-Wrapper Class-Vector.	
Unit III	**Exception Handling, Multithreading and File Handling**	**13 Hours**
	Exception Handling: Introduction- Try block-catch Block-Exception types-Checked Exception- Multiple catch- throw-throws-Finally Block. **Multithreading**: Introduction-Multi-tasking and Multithreading-Characteristics of Thread. **File Handling:** The File Class- Byte Stream Classes-Character Stream Classes-Random Access File-Sequence Input Stream.	
Unit IV	**Applet, Graphics and Swing**	**12 Hours**
	Applet-Applet Life Cycle-APPLET Tag-Passing Parameters to Applets-getDocumentBase() and get Codebase()-Using Images-Drawing Image-Applet Interface. **Graphics:** Drawing Lines, Rectangles, Ovals, Arcs, Polygon, Polyline and clipping. **Swing:** Introduction to JFC-JApplet-JLabel-JButton and JTooltip Class-Text Components- JList and JComboBox-JTable-JScrollPane-JCheckBox-and JTextArea-JSlider Control.	
Unit V	**Servlet and JDBC**	**12 Hours**
	Servlet: Introduction-Dynamic HTML-CGI SCRIPT-Java Servlet Servlet Container-The Servlet Life Cycle-Servlet Interface-Generic Serlvlet Class-HttpServletClass-HttpServletRequest Interface- HttpServletResponse Interface-getOutputStream method-Parameter passing to servlet. **JDBC:** Introduction-Database Connectivity-ODBC API-JDBC API-JDBC Application Architecture-Exploring java.sql-Obtaining a Connection-Steps for creating the ODBC DSN-The statement Object-working with Result set-Prepared Statement-Query Prepared Statement.	

Pedagogy

Class Room Lectures, Power point Presentation, Brain storming Activity.

Text Book

1. Krishnamoorthy.R ,Prabhu.S (2014),"*Inernet and Java Programming*",1st Edition,New Age International (P) Ltd, New Delhi.

Reference Books

1. Herbert schildt (2017), "*The complete reference"*,10th edition,Tata McGraw Hill Educaion, New Delhi.

2. J. Nino, F. A. Hosch (2002), An Introduction to programming and OO design using Java, John Wiley & sons, New Jersey.

3. Y. Daniel Liang (2015*)," Introduction to Java programming*", 10th edition, Pearson education, India.

E-Resources

- https://www.w3schools.com/java/java_intro.asp
- https://www.tutorialspoint.com/java/index.htm
- https://www.javatpoint.com/java-tutorial
- https://www.codecademy.com/learn/learn-java
- https://www.coursera.org/specializations/java-programming

Course Outcomes

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

CO1	Understand the fundamentals of programming.
CO2	Demonstrate the concepts of packages and String Handling.
CO3	Apply the concepts of Exception Handling and Multithreading
CO4	Implement GUI based application using Applet and Swing.
CO5	Build Servlet programs for web application with JDBC.

Mapping of Course Outcomes (COs) with Programme Specific Outcomes

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11	PSO 12
CO1	3	1	1	1	3	3	1	1	1	1	1	3
CO2	3	1	2	2	2	3	2	1	1	1	1	3
CO3	3	3	2	2	3	3	2	1	1	1	1	3
CO4	3	3	2	3	3	3	2	1	1	1	1	3
CO5	3	3	2	3	3	3	3	1	1	1	1	3

3. High; 2. Moderate ; 1. Low

Articulation Mapping - K Levels with Course Outcomes (COs)

Units	COs	K-Level	Section A		Section B	Section C
			MCQs		Either/ or Choice	Open Choice
			No. of Questions	K-Level	No. of Question	No. of Question
1	CO1	Up to K1	2	K1&K1	2(K1&K1)	1(K1)
2	CO2	Up to K2	2	K1&K1	2(K2&K2)	1(K2)
3	CO3	Up to K3	2	K1&K2	2(K3&K3)	1(K2)
4	CO4	Up to K3	2	K1&K2	2(K2&K2)	1(K3)
5	CO5	Up to K3	2	K1&K2	2(K3&K3)	1(K3)
No of Questions to be asked			10		10	5
No of Questions to be answered			10		5	3
Marks for each Question			1		4	30
Total marks for each Section			10		20	30

K1 – Remembering and recalling facts with specific answers
K2 – Basic understanding of facts and stating main ideas with general answer
K3 – Application oriented – Solving problems

Distribution of Section - wise Marks with K Levels

K Levels	Section A (No Choice)	Section B (Either/or)	Section C (Open)	Total Marks	% of Marks without Choice	Consolidated (Rounded off)
K1	7	8	10	25	25%	25%
K2	3	16	20	39	39%	39%
K3		16	20	36	36%	36%
Total Marks	10	40	50	100	100%	100%

Lesson Plan

	Java Basics	**9 Hours**	**Mode**
Unit I	a. Introduction, History of Java, Features of Java	1	Descriptive method PPT presentation
	b. Java Tokens, Keywords, Identifiers, Constants, Data Types	1	
	c. Operators, and Control Statements	2	
	d. Classes and Objects	2	
	e. Exploring Methods and Inheritance	3	
Unit	**Packages and String Function**	**9 Hours**	**Mode**

II	a. User Defined Packages, Hoe to create a Package?, Class Member Access Protection, Class Path	1	Descriptive method PPT presentation
	b. Introduction to Interface, Creating an Interface, Extending Interface	2	
	c. Introduction to Strings, String Functions,	2	
	d. Arrays and Types ,Array of Objects	2	
	e. Wrapper Class, Vector	2	
Unit III	**Exception Handling, Multithreading and File Handling**	**13 Hours**	**Mode**
	a. Exception Handling, Try block, Catch Block, Exception Types Checked Exception,	3	
	b. Multiple Catch , throw, throws , Finally Block	2	
	c. Introduction, Multi-tasking and Multithreading, Characteristics of Thread	3	PPT presentation Descriptive method
	d. The File Class- Byte Stream Classes-Character Stream Classes-	3	
	e. Random Access File-Sequence Input Stream.	2	
Unit IV	**Applet, Graphics and Swing**	**12 Hours**	**Mode**
	a. Applet, Applet Life Cycle, APPLET Tag, Passing Parameters to Applets, getDocumentBase() and get Codebase()	3	
	b. Images, Drawing Image, Applet Interface	2	Descriptive method
	c.Drawing Lines, Rectangles, Ovals, Arcs, Polygon, Polyline and clipping	3	
	d.Introduction to JFC-JApplet-JLabel-JButton and JTooltip Class	2	
	e.Text Components- JList and JComboBox-JTable-JScrollPane-JCheckBox-and JTextArea-JSlider Control.	2	
Unit V	**Servlet and JDBC**	**12 Hours**	**Mode**
	a. Introduction, Dynamic HTML,CGI SCRIPT, Java Servlet Servlet Container, The Servlet Life Cycle	2	PPT presentation Descriptive method
	b. Servlet Interface, Generic Serlvlet Class, HttpServletClass, HttpServletRequest Interface,	2	
	c.HttpServletRespons. Interface, getOutputStreammethod, Parameter passing to servlet.	2	
	d. JDBC,Introduction, Database Connectivity, ODBC API,JDBC API, JDBC Application Architecture, Exploring java.sql	3	
	e. Obtaining a Connection, Steps for creating the ODBC DSN, The statement Object, working with result set, Prepared Statement-Query, Prepared Statement.	3	

Course designed by: S.Vijayalakshmi

Programme	**B.Sc,(IT)**	**Programme Code**		**UIT**	
Course Code	**20UITC4P**	Number of Hours/Cycle		**4**	
Semester	**IV**	Max. Marks		**100**	
Part	**III**	**Credit**		**3**	
Core Practical VI					
Course Title	**Advanced Java Programming-Lab**		**L**	**T**	**P**
Cognitive Level		**Up to K4**	**-**	**-**	**60**

Preamble

To implement fundamentals of Object oriented programming in java, including packages, thread, exception handling, applet, swing and JDBC.

Program list

1. Classes and Objects
2. Inheritance
3. Interfaces
4. Packages
5. Exception Handling
6. Multithreading
7. Collection Interfaces
8. Read a file and Display the file
9. Applet Programming
10. program for Changing Layout of Applet
11. Applying Swing concepts
12. Applying swing concepts
13. JDBC
14. Write a Servlet program for login page.

Course designed by: S.Vijayalakshmi

Programme	**B.Sc.(IT)**	**Programme Code**		**UIT**	
Course Code	**20UITC42**	Number of Hours/Cycle		**4**	
Semester	**IV**	Max. Marks		**100**	
Part	**III**	**Credit**		**3**	
Core Course VI					
Course Title	**Operating System Concepts**		**L**	**T**	**P**
Cognitive Level		**Up to K3**	**55**	**5**	**-**

Preamble

The course facilitates the students to make acquainted the essential concepts of operating systems and its functions, services and management policies with processes, deadlock, and memory, file and disk operations.

Unit I	**Introduction and Operating System Structure**	**9 Hours**
	Introduction: OS Concepts- Operating System Structure- Batch Systems- Multi programmed Systems- Time sharing systems- Desktop systems – Multiprocessor Systems - Distributed Systems. **System Structure:** System Components- System Calls.	
Unit II	**Process and CPU Scheduling**	**11 Hours**
	Process: Process concept- Process States -Process Scheduling- Operations on Process- Co-Operating Processes- Inter process Communication-CPU Scheduling: Basic Concepts- Scheduling Criteria-Scheduling Algorithms.	
Unit III	**Process Synchronization and Deadlock**	**14 Hours**
	Process Synchronization: Background- Critical Section Problem **Deadlock:** Examples of Deadlock- Deadlock characterization- Methods for handling Deadlocks-Deadlock Prevention-Deadlock Avoidance-Deadlock Detection and Recovery.	
Unit IV	**Memory Organization and Management**	**12 Hours**
	Memory Management: Background-Swapping- Memory organization, Memory Management, Hierarchy, Memory Management Strategies - Contiguous and Non-Contiguous Memory allocation -Paging-Segmentation. **Virtual Memory:** Background- Demand Paging-Page Replacement- Allocation of Frames Thrashing.	
Unit V	**File System and Disk Scheduling**	**9 Hours**
	File System: File Concepts-Access Methods-Allocation Methods-Free Space Management- File Access control. **Disk Scheduling:** Disk Structure- Disk Scheduling strategies-FCFS Scheduling SSTF Scheduling- SCAN and CSCAN Scheduling- LOOK and CLOOK Scheduling	

Pedagogy

Class Room Lectures, Power point Presentation, Brain storming Activity.

Text Book

1. SilberschatzGalving Gange,(2008), "*Operating System Concepts*",6th Edition, Wiley India (P)Ltd.,New Delhi.

Reference Books

1. Deitel., and Deitel Choffnes., (2008),*"Operating Systems"*,Pearson education,Third edition.

2. Pramod Chandra P. Bhatt., (2008),*"An introduction to operating systems concepts and practice"*, PHI, Second Edition.

3. Pal Choudhury., (2001), *"Operating Systems Principles and Design"*, PHI Learning.

4. Dhananjay M.Dhamdhere.,(2012), *"Operating Systems"*, A Concept Based Approach Tata McGraw Hill, 3rd Edition.

E-Resources

- https://www.tutorialspoint.com/operating_system/index.htm
- https://www.oreilly.com/library/view/
- https://www.geeksforgeeks.org/introduction-of-operating-system-set-1/
- https://en.wikipedia.org/wiki/Transaction_processing_system
- https://www.tutorialspoint.com/operating_system/os_memory_management.htm

Course Outcomes

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

CO1	Explain the operating system concepts, and its components.
CO2	Understand process management, concurrent processes and CPU scheduling.
CO3	Detect and Solve deadlock problems.
CO4	Identify memory management Techniques.
CO5	Implement Disk scheduling Methods.

Mapping of Course Outcomes (COs) with Programme Specific Outcomes

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11	PSO 12
CO1	3	2	1	0	3	1	1	2	1	1	1	3
CO2	2	3	2	1	3	1	2	1	1	1	1	3
CO3	2	2	3	2	3	2	2	1	1	1	1	3
CO4	2	3	1	1	3	1	2	1	1	1	1	3
CO5	2	2	2	1	3	2	2	1	1	1	1	3

3. High; 2. Moderate ; 1. Low

Articulation Mapping - K Levels with Course Outcomes (COs)

Units	**COs**	**K-Level**	**Section A**		**Section B**	**Section C**
			MCQs		**Either/ or Choice**	**Open Choice**
			No. of Questions	**K-Level**	**No. of Questions**	**No. of Questions**
1	CO1	Up to K1	2	K1&K1	2(K1&K1)	1(K1)
2	CO2	Up to K2	2	K1&K1	2(K2&K2)	1(K2)
3	CO3	Up to K3	2	K1&K2	2(K3&K3)	1(K3)
4	CO4	Up to K2	2	K1&K2	2(K2&K2)	1(K2)
5	CO5	Up to K3	2	K1&K2	2(K3&K3)	1(K3)
No of Questions to be asked			10		10	5
No of Questions to be answered			10		5	3
Marks for each Question			1		4	10
Total marks for each Section			10		20	30

K1 – Remembering and recalling facts with specific answers
K2 – Basic understanding of facts and stating main ideas with general answers
K3 – Application oriented – Solving problems

Distribution of Section - wise Marks with K Levels

K Levels	**Section A (No Choice)**	**Section B (Either/or)**	**Section C (Either/or)**	**Total Marks**	**% of Marks without Choice**	**Consolidated (Rounded off)**
K1	7	8	10	25	25%	25%
K2	3	16	20	39	39%	39%
K3	-	16	20	36	36%	36%
Total Marks	10	40	50	100	100%	100%

Lesson Plan

Unit I	**Introduction and Operating System Structure**	**9 Hours**	**Mode**
	a. OS Concepts, Operating System Structure, OS Concepts.	2	Descriptive method PPT
	b. Batch Systems, Multi programmed Systems, Time sharing systems	2	
	c. Desktop systems, Multiprocessor Systems, Distributed Systems	3	
	d. System Components, System Calls.	2	
Unit II	**Process and CPU Scheduling**	**11 Hours**	**Mode**
	a. Process concept, Process States	2	Descriptive method
	b. Process Scheduling, Operations on Process	2	
	c. Co Operating Processes, Inter process Communication	2	
	d. Basic Concepts, Scheduling Criteria	2	
	e. Scheduling Algorithms	3	
Unit III	**Process Synchronization and Deadlock**	**14 Hours**	**Mode**
	a. Process Synchronization, Critical Section Problem	2	PPT presentation Descriptive method
	b. Deadlock, Examples of Deadlock, Deadlock characterization	3	
	c. Methods for handling Deadlocks, Deadlock Prevention	4	
	d. Deadlock Avoidance	2	
	e. Deadlock Detection and Recovery	3	
Unit IV	**Memory Organization and Management**	**12 Hours**	**Mode**
	a. Memory Management, Swapping, Memory organization	2	Descriptive method Assignment
	b. Memory Management, Hierarchy, Memory Management Strategies	2	
	c. Contiguous and Non-Contiguous Memory allocation	2	
	d. Segmentation Virtual Memory, Demand Paging	3	
	e. Page Replacement, Allocation of Frames Thrashing.	3	
Unit V	**File System and Disk Scheduling**	**9 Hours**	**Mode**
	a. File System Concepts, Access Methods, Allocation Methods	2	PPT presentation Descriptive method
	b. Free Space Management, File Access control	1	
	c. Disk Structure, Disk Scheduling strategies	2	
	d. FCFS Scheduling, SSTF Scheduling	2	
	e. SCAN and CSCAN Scheduling, LOOK and CLOOK Scheduling	2	

Course designed by: N.Thambirajan

Programme	**B.Sc.(IT)**	**Programme Code**			**UIT**
Course Code	**20UITS4P**	Number of Hours/Cycle			**2**
Semester	**IV**	Max. Marks			**50**
Part	**III**	**Credit**			**2**
Skill Based Practical II					
Course Title	**Fundamentals of Hardware Practices-Lab**		**L**	**T**	**P**
Cognitive Level		**Up to K3**	**-**	**-**	**60**

Preamble

To familiarize a computer system layout and mark the positions of SMPS, Motherboard, FDD, HDD, CD/DVD drive and add on cards and install OS.

Program list:

1. Assemble a PC by fixing motherboard, processor and cooling fan.
2. Fix a Hard drive and DVD and connect the Data, power cables.
3. Connect the power cables with SMBS
4. Install windows X Operating System with service pack
5. Install Open Source Operating System and Open Source software.
6. Install an Audio driver software and check the functionality
7. Install the application software and check the functionality
8. How can you test the SMPS.
9. How can you test the memory to determine if it is bad?
10. How to check the Network card not connected properly.
11. Set up and configure Networking System using various network devices.

Course designed by: N.Thambirajan

Programme	**B.Sc IT.**	**Programme Code**		**UIT**	
Course Code	**20UITC51**	**Number of Hours/Cycle**		**4**	
Semester	**V**	**Max. Marks**		**100**	
Part	**III**	**Credit**		**4**	
Core Course VII					
Course Title	**Data Communication and Computer Networks**		**L**	**T**	**P**
Cognitive Level		**Upto K3**	**55**	**5**	**-**

Preamble

The subject is planned to give the inside and outside information on Networks. It additionally reveals insight around wide spread utilizations of the Internet.

Unit I	**Introduction to Data communication and networks**	**10 Hours**
	Introduction: A Brief History - Applications - Computer Networks - Categories of Networks - Standards and Standards Organizations - Network Architecture - Open Systems and OSI Model - TCP/IP Architecture.**Communication Media and Data Transmission:** Analog and Digital Data Transmission - Modulation and Demodulation - Transmission media - Wireless Communications - Data Transmission Basics - Transmission Mode.	
Unit II	**Local Area Networks&Wide Area Networks**	**10 Hours**
	Local Area Networks: Types of Networks and Topology - LAN Transmission Equipment - LAN Installation and Performance.**Wide Area Networks:** Transmission Methods - Carrier Types - Transmission Equipments - Design and Multicast Considerations - Protocols.	
Unit III	**Wireless LANs**	**13 Hours**
	Wireless LANs: WLAN Applications - Wireless LAN Requirements - Planning for Wireless LANs - Wireless LAN Architecture - IEEE 802.11 Protocol Layer - IEEE 802.11 Physical Layer - Designing the Wireless LAN Layout - WAP Services.	
Unit IV	**Internet Working & TCP Reliable Transport Service**	**12 Hours**
	Internet Working: Principles of Internet Working - Routing Principles - Internetwork Protocols(IP) - Shortcomings of IPV4 - IP Next Generation.**TCP Reliable Transport Service:** Transport Protocols - The Service TCP Provides to Applications - End- to- End Service and Datagram's - Transmission Control Protocol -User Datagram Protocol.	
Unit V	**Network Applications &Network Security**	**10 Hours**

	Network Applications: Client- Server Model - Domain Name System (DNS) - Telnet - File Transfer and Remote File Access - Electronic Mail - World Wide Web (WWW).**Network Security:** Fundamental Concepts – Identification and Authentication – Access control – A Model for network Security – Malicious Software – Securing Network using Firewall – Web Security.	

Pedagogy

Class Room Lectures, Power point presentation, , Seminar, Quiz, Assignments

Text Book

1. Brijendra Singh., (2006),"*Data Communications and Computer Networks*",2nd Edition,Prentice-Hall of India Pvt.Ltd.

Reference Books

1.Achyut S Godbole, (2011),- and AtulKahate, "*DataCommunications and Networks",* 2nd Edition, Tata McGraw-Hill.

2. B A Forouzan,(2017), "*DataCommunications & Networking"*, 5th Edition, Tata McGraw-Hill.

3. Andrew S Tanenbaum,(2003),"*Computer Networks"*,4th Edition, Pearson-Prentice Hall.

E-Resources

- https://www.tutorialspoint.com/data_communication_computer_network/dcn_useful_resources.htm
- https://en.wikiversity.org/wiki/Basic_computer_network_components
- https://www.youtube.com/watch?v=0PbTi_Prpgs

Course Outcomes

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

CO1	Understand the basics of data communication, networking, internet and their importance.
CO2	Classify the services and features of LAN and WAN networks.
CO3	Illustrate wired and wireless computer networks.
CO4	Summarize TCP/IP and their protocols.
CO5	Demonstrate various network security issues

Mapping of Course Outcomes (COs) with Programme Specific Outcomes

	PSO 1	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**	**PSO 6**	**PSO 7**	**PSO 8**	**PSO 9**	**PSO 10**	**PSO 11**	**PSO 12**
CO 1	3	3	2	1	3	2	1	2	1	1	1	3
CO 2	3	3	3	1	3	2	2	3	1	1	1	3
CO 3	3	3	2	1	3	3	2	2	1	1	1	3
CO 4	3	3	2	1	3	2	2	3	1	1	1	3
C0 5	3	3	3	1	2	3	2	2	1	2	1	3

3.High; 2. Moderate ; 1. Low

Articulation Mapping - K Levels with Course Outcomes (COs)

Units	COs	K-Level	Section A	Section B	Section C
			MCQs	Either/ or Choice	Open Choice
			No. of Questions	No. of Question	No. of Question
1	CO1	Up to K2	2(K1& K2)	2(K1 & K1)	1(K1)
2	CO2	Up to K2	2(K1 & K2)	2(K2 & K2)	1(K2)
3	CO3	Up to K3	2(K1 & K2)	2(K3 & K3)	1(K3)
4	CO4	Up to K2	2(K1& K2)	2(K2 & K2)	1(K2)
5	CO5	Up to K3	2(K1& K2)	2(K3 & K3)	1(K3)
No of Questions to be asked			10	10	5
No of Questions to be answered			10	5	3
Marks for each Question			1	4	10
Total marks for each Section			10	20	30

K1 – Remembering and recalling facts with specific answers
K2 – Basic understanding of facts and stating main ideas with general answers
K3 – Application oriented – Solving problems

Distribution of Section - wise Marks with K Levels

K Levels	Section A (No Choice)	Section B (Either/or)	Section C (Open Choice)	Total Marks	% of Marks without Choice	Consolidated (Rounded off)
K1	5	8	10	23	23%	23%
K2	5	16	20	41	41%	41%
K3	-	16	20	36	36%	36%
Total Marks	10	40	50	100	100%	100%

Lesson Plan

Unit I	**Introduction to data communication and networks**	**10 Hours**	**Mode**
	a. Applications, Computer Networks, Categories of Networks ,Standards and Standards Organizations	**2**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Network Architecture , Open Systems and OSI Model, TCP/IP Architecture.	**3**	
	c. Analog and Digital Data Transmission, Modulation and Demodulation	**2**	
	d. Transmission media, Wireless Communications, Data Transmission Basics, Transmission Mode.	**3**	
Unit II	**Local Area Networks &Wide Area Networks**	**10 Hours**	**Mode**

	a. Types of Networks and Topology, LAN Transmission Equipment	**2**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. LAN Installation and Performance.	**3**	
	c. Transmission Methods, Carrier Types	**1**	
	d. Transmission Equipments	**2**	
	e. Design and Multicast Considerations, Protocols.	**2**	
Unit III	**Wireless LANs**	**13 Hours**	**Mode**
	a. WLAN Applications, Wireless LAN Requirements	**3**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Planning for Wireless LANs, Wireless LAN Architecture.	**3**	
	c. IEEE 802.11 Protocol Layer, IEEE 802.11	**3**	
	d. Physical Layer, Designing the Wireless LAN Layout, WAP Services.	**4**	
Unit IV	**Internet Working & TCP Reliable Transport Service**	**12 Hours**	**Mode**
	a. Principles of Internet Working , Routing Principles	**3**	
	b. Internetwork Protocols (IP), Shortcomings of IPV4, IP Next Generation.	**3**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	c. Transport Protocols, The Service TCP Provides to Applications, End- to- End Service and Datagram's	**3**	
	d. Transmission Control Protocol, User Datagram Protocol.	**3**	
Unit V	**Network Applications & Network Security**	**10 Hours**	**Mode**
	a. Client&Server Model, Domain Name System (DNS),Telnet, File Transfer	**3**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Electronic Mail - World Wide Web (WWW)	**2**	
	c. Identification and Authentication Access control, A Model for network Security	**2**	
	d. Malicious Software, Securing Network using Firewall, Web Security.	**3**	

Course designed by Mr.N.Thambirajan

Programme	**B.Sc. IT.**	**Programme Code**			**UIT**
Course Code	**20UITC5P**	**Number of Hours/Cycle**			**4**
Semester	**V**	**Max. Marks**			**100**
Part	**III**	**Credit**			**4**
Core Practical VII					
Course Title	**Network Simulation-Lab**		**L**	**T**	**P**
Cognitive Level		**Up to K3**	**-**	**-**	**60**

Preamble

This course provides the knowledge to Design and implement Computer network virtually for Local Area network along with routing concepts.

Program List:

1. To prepare different types of Network cables and practically implement the cross-wired cable and straight through cable using crimping tool.
2. Install TCP/IP and assign IP address, subnet mask and gateway.
3. Connect the computers in Local Area Network.
4. To run basic network command and Network configuration commands.
5. Interpreting Ping and Trace route Output.
6. Performing an Initial Switch Configuration.
7. Performing an Initial Router Configuration.
8. Routing Static
9. Connecting a Switch.
10. Configuring WEP on a Wireless Router.
11. Examining WAN Connections

Course designed by Mr.N.Thambirajan

Programme	**B.Sc.IT.**	**Programme Code**		**UIT**	
Course Code	**20UITC52**	**Number of Hours/Cycle**		**4**	
Semester	**V**	**Max. Marks**		**100**	
Part	**III**	**Credit**		**4**	
Core Course VIII					
Course Title	**Python Programming**		**L**	**T**	**P**
Cognitive Level		**Up to K3**	**55**	**5**	**-**

Preamble

This Course is designed to provide basic knowledge of python basics, functions, lists, strings, classes and objects.

Unit I	**Introduction to Computer and Python Programming**	**9 Hours**
	Introduction-What is a Computer?-Overview of Programming Languages - History of Python - Installing Python in Ubuntu - Executing Python Programs – Commenting in Python – Internal Working of Python – Python Implementations.	
Unit II	**Basics of Python Programming**	**9 Hours**
	Introduction-Python Character Set – Token – Python Core Data Type – The print() Function – Assigning Values to a Variable – Multiple Assignments – Writing Simple Programs in Python-The input() Function – The eval() Function-Formatting Number and Strings – Python Inbuilt Functions-Operators and Expressions.	
Unit III	**Decision Statements and Loop Control Statements**	**13 Hours**
	Introduction – Boolean Type – Boolean Operators – Using Numbers With Boolean Operators – Using String with Boolean Operators – Boolean Expressions and Relational Operators – Decision Making Statements – Conditional Expressions – The while Loop – The range() Function – The for Loop – Nested Loops – The Break Statements – The Continue Statements.	
Unit IV	**Functions ,String and Lists**	**12 Hours**
	Introduction – Syntax and Basics of a Functions – Use of a Functions – Parameters and Arguments in a Function – The Local and Global Scope of a Variable – The return Statement – Recursive Functions – The Lambda Functions – Strings – Lists – Searching Techniques – Introduction to Sorting.	
Unit V	**Object Oriented Programming and File Handling**	**12 Hours**
	Class – Objects – Inheritance – Tuples – Sets – Dictionaries – Using Python Libraries - File Handling.	

Pedagogy

Class Room Lectures, Power point presentation, , Seminar, Quiz, Assignments.

Text Book

1. Ashok NamdevKamthane, Amit Ashok Kamthane(2018) , "*Programming andProblem Solving with Python* ", McGraw-Hill Education(India) Private Limited.

Reference Books

1.Leonard Eddison, (2018), "*Python Programming, A step by step Guide for Beginners*", 2nd Edition Atlantic Publishers.

2.Martin C. Brown , (2018), "*Python The Complete Reference*" , 2nd Edition McGraw Hill Edition (India) Private Limited, New Delhi.

3.Dr.NageswaraRao, R.(2018), "*Core Python Programming*", 2nd Edition, DreamTech Press.

Resources

- www.python.org
- www.w3schools.com
- www.programiz.com

Course Outcomes

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

CO1	Understanding the basic concepts of computer and Python Programming.
CO2	Explain the basic principles of python programming language.
CO3	Express different Decision Making and Looping Statements.
CO4	Develop python programs using strings, list and files.
CO5	Apply Object Oriented Programming concepts.

Mapping of Course Outcomes (COs) with Programme Specific Outcomes

	PSO1	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**	**PSO 6**	**PSO 7**	**PSO 8**	**PSO 9**	**PSO 10**	**PSO 11**	**PSO 12**
CO1	2	1	3	2	1	2	2	1	1	1	1	3
CO2	2	1	3	2	1	3	3	1	2	1	1	3
CO3	3	1	3	3	2	3	3	3	1	1	1	3
CO4	3	1	3	3	2	3	2	3	1	1	1	3
C05	3	1	3	3	2	3	3	2	1	1	1	3

3.High; 2. Moderate ; 1. Low

Articulation Mapping - K Levels with Course Outcomes (COs)

Units	**COs**	**K-Level**	**Section A**	**Section B**	**Section C**
			MCQs	**Either/ or Choice**	**Open Choice**
			No. of Questions	**No. of Questions**	**No. of Questions**
1	CO1	Up to K2	2(K1& K2)	2(K1 & K1)	1(K1)
2	CO2	Up to K2	2(K1 & K2)	2(K1 & K1)	1(K2)
3	CO3	Up to K2	2(K1 & K2)	2(K2 & K2)	1(K2)
4	CO4	Up to K3	2(K1& K2)	2(K2 & K2)	1(K3)
5	CO5	Up to K3	2(K1& K2)	2(K3 & K3)	1(K3)
No of Questions to be asked			10	10	5
No of Questions to be answered			10	5	3
Marks for each Question			1	4	10

Total marks for each Section	10	20	30

K1 – Remembering and recalling facts with specific answers
K2 – Basic understanding of facts and stating main ideas with general answers
K3 – Application oriented – Solving problems

Distribution of Section - wise Marks with K Levels

K Levels	Section A (No Choice)	Section B (Either/or)	Section C (Open Choice)	Total Marks	% of Marks without Choice	Consolidated (Rounded off)
K1	5	16	10	31	31%	31%
K2	5	16	20	41	41%	41%
K3	-	8	20	28	28%	28%
Total Marks	10	40	50	100	100%	100%

Lesson Plan

Unit I	**Introduction to Computer and Python Programming**	**9 Hours**	**Mode**
	a.Introduction, What is a Computer? ,Overview of Programming Languages	3	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b.History of Python , Installing Python in Ubuntu, Executing Python Programs	3	
	c. Commenting in Python , Internal Working of Python	1	
	d. Python Implementations Communications, Data Transmission Basics, Transmission Mode.	2	
Unit II	**Basics of Python Programming**	**9 Hours**	**Mode**
	a. Introduction ,Python Character Set ,Token	1	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Python Core Data Type , The print() Function , Assigning Values to a Variable , Multiple Assignments	2	
	c. Writing Simple Programs in Python, The input() Function , The eval() Function	3	
	d.Formatting Number and Strings , Python Inbuilt Functions, Operators and Expressions	3	
Unit III	**Decision Statements and Loop Control Statements**	**13 Hours**	**Mode**
	a. Introduction , Boolean Type , Boolean Operators , Using Numbers With Boolean Operators	3	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b.Using String with Boolean Operators , Boolean Expressions and Relational Operators	3	
	c.Decision Making Statements , Conditional Expressions	2	
	d.The while Loop , The range() Function ,The for Loop , Nested Loops	3	
	e. The Break Statements ,The Continue Statements	2	
Unit IV	**Functions ,String and Lists**	**12 Hours**	**Mode**
	a. Introduction , Syntax and Basics of a Functions , Use of a Functions	3	

	b. Parameters and Arguments in a Function , The Local and Global Scope of a Variable ,The return Statement	3	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	c. Recursive Functions , The Lambda Functions Strings	3	
	d. Lists , Searching Techniques , Introduction to Sorting.	3	
Unit V	**Object Oriented Programming and File Handling**	**12 Hours**	**Mode**
	a. Class , Objects , Inheritance	4	Class room lectures, Power Point Presentation,
	b. Tuples , Sets , Dictionaries	4	
	c. Using Python Libraries	1	
	d. File Handling.	3	

Course designed by Mrs.P.Murugeswari

Programme	**B.Sc.IT.**	**Programme Code**			**UIT**
Course Code	**20UITC5Q**	**Number of Hours/Cycle**			**4**
Semester	**V**	**Max. Marks**			**100**
Part	**III**	**Credit**			**3**
Core Practical VIII					
Course Title	**Python Programming -Lab**		**L**	**T**	**P**
Cognitive Level		**Up to K3**	**-**	**-**	**60**

Preamble

To enable the students to familiar with python programming basics, Functions, Strings, Lists, Classes and Objects.

Program List:

1. Display the terms of a Fibonacci series.
2. Programs that take command line arguments(word count)
3. Program to display calendar.
4. Program to find factorial of a number using recursion.
5. Program to check if the given number is Happy Number.
6. Program to print the elements of an array present on odd position
7. Program to Add and Multiply Matrices
8. To convert list to dictionary.
9. Program to merge two dictionaries.
10. Program to sort a given number using bubble sort.
11. Linear search and Binary Search
12. Process employee payroll using class and objects.
13. Remove punctuation marks of a given string.
14. Demonstrate file process.

Course designed by Mrs.P.Murugeswari

Programme	**B.Sc.IT.**	**Programme Code**		**UIT**	
Course Code	**20UITC53**	**Number of Hours/Cycle**		**4**	
Semester	**V**	**Max. Marks**		**100**	
Part	**III**	**Credit**		**3**	
Core Course IX					
Course Title	**Software Engineering**		**L**	**T**	**P**
Cognitive Level		**Up to K3**	**55**	**5**	**-**

Preamble

This Course enables the students to acquire knowledge in software engineering principles like process model, requirement engineering, software design and testing.

Unit I	**Introduction to Software Engineering**	**9 Hours**
	The nature of software-Changing nature of software-The software Process-software Engineering Practice-software Development myths.	
Unit II	**Software Engineering Models**	**9 Hours**
	The Process Model: Prescriptive Process Model-Specialized Process Model-**Agile Development:** What is Agility-Agility and Cost of Change-What is Agile Process-Other Agile Process Model.	
Unit III	**Requirement Engineering**	**13 Hours**
	Requirement Engineering- Establishing Ground work-Eliciting Requirements-Developing Use cases-Building The Analysis Model-**Requirement Modeling-Scenario Based methods**: Requirement analysis-Scenario Based modeling-UML Model that supplements the Use case- **Class Based methods :** Identifying Analysis Classes-Specifying Attributes-Defining Operations-Class responsibility collaborator Modeling-Association and Dependencies-Analysis packages.	
Unit IV	**Software Design and Review**	**12 Hours**
	Architectural Design: Software Architecture-Architectural Genres- Architectural styles- Architectural considerations- Architectural decision- Architectural Design-**Component Level Design:** What is Component?-Designing Class based Components- Conducting Component level Design- **Review techniques:** Cost impact of software defects-Defect Amplification and Removal-Review Metrics and their uses-Informal Review- Formal Technical Review.	
Unit V	**Software Testing**	**12 Hours**
	Software Testing Strategies: Strategic Approach to Software Testing- Strategic issues-Test Strategies of Conventional Software- Test Strategies of Object-Oriented Software-Validation testing-System testing-The Art of Debugging-**Testing Conventional Applications:** Software Testing Fundamentals-Internal and External View of testing-White box Testing-Basis path Testing-Control Structure Testing-Black Box Testing.	

Pedagogy

Class Room Lectures, Power point presentation, , Seminar, Quiz, Assignments

Text Book

1. Roger S. Pressman and Bruce R. Maxin, (2014*),"Software Engineering _ A Practitioner's Approach"*, McGraw-Hill Education.

Reference Books

1.James F. Peters, WitoldPedrycz,(1999*),"Software Engineering, an Engineering approach"*, John Wiley.

2.Sommerville,(2004), "*Software Engineering*", 7th edition, Pearson Education.

3.Waman S Jawadekar , (2004),*"Software Engineering principles and practice"*, The McGraw-Hill Companies.

E-Resources

- **https://www.rsa.com/spi/**
- e-Yantra: Engineering for Better Tomorrow: new.e-yantra.org
- Harvard open courseware: extension.harvard.edu/courses

Course Outcomes

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

CO1	Define software Engineering.
CO2	Explain various software development models and processes
CO3	Create UML diagrams for a given software requirement specification.
CO4	Report a Design Documents and Explain review techniques.
CO5	Apply software Testing methods.

Mapping of Course Outcomes (COs) with Programme Specific Outcomes

	PSO 1	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**	**PSO 6**	**PSO 7**	**PSO 8**	**PSO 9**	**PSO 10**	**PSO 11**	**PSO 12**
CO 1	2	1	3	2	1	2	2	1	1	1	1	3
CO 2	2	1	3	2	1	3	3	1	2	1	1	3
CO 3	3	1	3	3	2	3	3	3	1	1	1	3
CO 4	3	1	3	3	2	3	2	3	1	1	1	3
C0 5	3	1	3	3	2	3	3	2	1	1	1	3

3.High; 2. Moderate ; 1. Low

Articulation Mapping - K Levels with Course Outcomes (COs)

Units	**COs**	**K-Level**	**Section A**	**Section B**	**Section C**
			MCQs	**Either/ or Choice**	**Open Choice**
			No. of Questions	**No. of Question**	**No. of Question**
1	CO1	Up to K2	2(K1& K2)	2(K1 & K1)	1(K1)
2	CO2	Up to K2	2(K1 & K2)	2(K1 & K1)	1(K2)
3	CO3	Up to K2	2(K1 & K2)	2(K2 & K2)	1(K2)
4	CO4	Up to K3	2(K1& K2)	2(K2 & K2)	1(K3)
5	CO5	Up to K3	2(K1& K2)	2(K2 & K2)	1(K3)
No of Questions to be asked			10	10	5

No of Questions to be answered	10	5	3
Marks for each Question	1	4	10
Total marks for each Section	10	20	30

K1 – Remembering and recalling facts with specific answers
K2 – Basic understanding of facts and stating main ideas with general answers
K3 – Application oriented – Solving problems

Distribution of Section - wise Marks with K Levels

K Levels	Section A (No Choice)	Section B (Either/or)	Section C (Open Choice)	Total Marks	% of Marks without Choice	Consolidated (Rounded off)
K1	5	16	10	31	31%	31%
K2	5	24	20	49	49%	49%
K3	-	-	20	20	20%	20%
Total Marks	10	40	50	100	100%	100%

Lesson Plan

Unit I	**Introduction to Software Engineering**	**9 Hours**	**Mode**
	a. Software Engineering an Introduction.	**3**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b.The software Process	**3**	
	c. software Engineering Practice	**3**	
Unit II	**Software Engineering Models**	**9 Hours**	**Mode**
	a. The Process Model	**4**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Agile Development	**5**	
Unit III	**Requirement Engineering Statements**	**13 Hours**	**Mode**
	a. Requirement Engineering	**3**	Class room lectures, Power Point Presentation, Group Discussion
	b. Requirement Modeling	**3**	
	c.UML Model	**4**	
	d. Class Based methods	**3**	
Unit IV	**Software Design and Review**	**12 Hours**	**Mode**
	a. The Design Process	**3**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Architectural Design	**4**	
	c. Component Level Design	**3**	
	d. Review techniques	**4**	
Unit V	**Software Testing**	**12 Hours**	**Mode**
	a. Software Testing Strategies	**3**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. System testing	**5**	
	c. Testing Conventional Applications	**4**	

Course designed by Mrs.P.Chandrakala

Programme	**B.Sc.IT**	**Programme Code**		**UIT**	
Course Code	**20UITC54**	**Number of Hours/Cycle**		**4**	
Semester	**V**	**Max. Marks**		**100**	
Part	**III**	**Credit**		**3**	
Core Course X					
Course Title	**Data Mining**		**L**	**T**	**P**
Cognitive Level	**Upto K3**		**55**	**5**	**-**

Preamble

This course aims at facilitating the students to understand the concepts of data mining and various techniques involved in mining the data from the databases.

Unit I	**Introduction**	**10 Hours**
	Motivation for Data Mining - Data Mining Issues - Importance - Data Mining from a Database Perspective - Statistical Perspective on Data Mining - Similarity Measures - Classification of Data Mining Systems - Major issues in Data Mining.	
Unit II	**Data Preprocessing and Algorithms**	**12 Hours**
	Types of data - Data cleaning - Aggregation - Sampling - Feature subset selection - wrapper and filter methods -Efficient and Scalable Frequent Item set Mining methods - Apriori - FP_ Tree - Handling large larger data sets in main memory.	
Unit III	**Classification and Clustering**	**14 Hours**
	Classification - Prediction - Voting - Bagging - Boosting - Stacking - Cascading - Random forest - Semi supervised Learning. **CLUSTERING:** Similarity and Distance Measures - Hierarchical Algorithms - Clustering Large Data sets - Clustering with Categorical Attributes - Outlier analysis.	
Unit IV	**Mining Data Streams**	**9 Hours**
	Challenges - Stream data model - Sampling data in a stream - Frequency moments of data stream- Counting frequency items in a stream - Mining time - Series databases.	
Unit V	**Mining Massive Datasets**	**10 Hours**
	Challenges- Mining high dimensional association rules – CARPENTER- classifying high dimensional data- PLANET- clustering high dimensional Data – BIRCH Distributed Data Mining.	

Pedagogy

Class Room Lectures, Power point presentation, , Seminar, Quiz, Assignments.

Text Book

1. Jiwai Han and MichelineKamber,(2012), "*Data Mining – Concepts and Techniques"*, Morgan Kaufmann.

Reference Books

1.Tan, Steinbach, Kumar, (2014), "*Introduction to Data Mining*", Pearson Education.

2.AnandRajaraman and Jeffrey Ullman, (2014),"*Mining Massive Data sets*", Cambridge University Press.

3.Giovanni Seni, John Elder, (2010), *"Ensemble methods in data mining: Improving accuracy through combining prediction"*, Morgan &ClayPool.

E-Resources

- https://www.talent.com/resources
- e-Yantra: Engineering for Better Tomorrow : new.e-yantra.org
- Harvard open courseware : extension.harvard.edu/courses

Course Outcomes

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

CO1	Explain the architecture of data mining process.
CO2	Associate suitable data pre-processing methods and algorithms.
CO3	Examine different classification and clustering techniques.
CO4	Explain Data stream mining.
CO5	Determine the processing methods for Massive data sets.

Mapping of Course Outcomes (COs) with Programme Specific Outcomes

	PSO 1	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**	**PSO 6**	**PSO 7**	**PSO 8**	**PSO 9**	**PSO 10**	**PSO 11**	**PSO 12**
CO 1	2	1	3	2	1	2	2	1	1	1	1	3
CO 2	2	1	3	2	1	3	3	1	2	1	1	3
CO 3	3	1	3	3	2	3	3	3	1	1	1	3
CO 4	3	1	3	3	2	3	2	3	1	1	1	3
C0 5	3	1	3	3	2	3	3	2	1	1	1	3

3.High; 2. Moderate ; 1. Low

Articulation Mapping - K Levels with Course Outcomes (COs)

Units	**COs**	**K-Level**	**Section A**	**Section B**	**Section C**
			MCQs	**Either/ or Choice**	**Open Choice**
			No. of Questions	**No. of Questions**	**No. of Questions**
1	CO1	Up to K2	2(K1& K2)	2(K1 & K1)	1(K1)
2	CO2	Up to K2	2(K1 & K2)	2(K2 & K2)	1(K2)
3	CO3	Up to K3	2(K1 & K2)	2(K3 & K3)	1(K3)
4	CO4	Up to K2	2(K1& K2)	2(K2 & K2)	1(K2)
5	CO5	Up to K3	2(K1& K2)	2(K3 & K3)	1(K3)
No of Questions to be asked			10	10	5
No of Questions to be answered			10	5	3
Marks for each Question			1	4	10
Total marks for each Section			10	20	30

K1 – Remembering and recalling facts with specific answers

K2 – Basic understanding of facts and stating main ideas with general answers

K3 – Application oriented – Solving problems

Distribution of Section - wise Marks with K Levels

K Levels	Section A (No Choice)	Section B (Either/or)	Section C (Open Choice)	Total Marks	% of Marks without Choice	Consolidated (Rounded off)
K1	5	8	10	23	23	23%
K2	5	16	20	41	41	41%
K3		16	20	36	36	36%
Total Marks	10	40	50	100	100	100%

Lesson Plan

Unit I	**Introduction**	**10 Hours**	**Mode**
	a. Perspective on Data Mining	**4**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Classification of Data Mining	**4**	
	c. Major issues	**2**	
Unit II	**Data Preprocessing and Algorithms**	**12 Hours**	**Mode**
	a. Data cleaning	**3**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Feature selection	**3**	
	c. Mining methods	**3**	
	d. Handling large larger data sets	**3**	
Unit III	**Classification and Clustering**	**14 Hours**	**Mode**
	a. Classification	**5**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Semi supervised Learning	**2**	
	c. Clustering	**4**	
	d. Outlier analysis.	**3**	
Unit IV	**Mining Data Streams**	**9 Hours**	**Mode**
	a. Stream data model	**3**	
	b. Frequency moments	**3**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	c. Mining time	**3**	
Unit V	**Mining Massive Datasets**	**10 Hours**	**Mode**
	a. Association rules	**2**	Class room lectures, Power Point Presentation
	b. Classification	**2**	
	c. Clustering	**3**	
	d. Distributed Data Mining.	**3**	

Course designed by Mrs.P.Chandrakala

Programme	**B.Sc. IT**	**Programme Code**		**UIT**	
Course Code	**20UITE51**	**Number of Hours/Cycle**		**4**	
Semester	**V**	**Max. Marks**		**100**	
Part	**III**	**Credit**		**4**	
Core Elective Course I A					
Course Title	**Cryptography and Network Security**		**L**	**T**	**P**
Cognitive Level		**Up to K3**	**55**	**5**	**-**

Preamble

To provide an in-depth knowledge in Cryptography Concepts and Techniques, Algorithms and IP security.

Unit I	**Attacks on Computer**	**8 Hours**
	Attacks on Computer and Computer Security: Introduction-The need for security-Security Approaches-Principles of security-Types of Attacks	
Unit II	**Cryptography: Concepts and Techniques**	**12 Hours**
	Cryptography: Plain text and cipher text-Substitution Techniques-Transposition Techniques-Encryption and Decryption-Symmetric and Asymmetric key Cryptography-Steganography.	
Unit III	**Symmetric key Algorithm**	**14 Hours**
	I**ntroduction**-Algorithm types and modes-Data Encryption Standard(DES)-International Data Encryption Algorithm(IDEA)-RC4-RC5-Blowfish-Advanced Encryption standard(AES).	
Unit IV	**Asymmetric key Algorithm**	**10 Hours**
	An overview of Asymmetric key Cryptography-RSA-Symmetric and Asymmetric key cryptography together-Digital Signature-knapsack Algorithm-Some other Algorithm.	
Unit V	**IP Security**	**11 Hours**
	Introduction-Secure Socket Layer(SSL)-Transport Layer Security(TLS)-Secure Hyper Text transfer Protocol(SHTTP)-Time Stamping Protocol(TSP)-Secure Electronic Transaction(SET)-SSL versus SET-Email Security.	

Pedagogy

Class Room Lectures, chalkboards, Power point presentation, You Tube, Group Discussion, Seminar, Quiz, Assignments, Brain storming Activity.

Text Book

1. AtulKahate,(2006)," *Cryptography and Network Security*",2nd Edition, Tata McGraw Hill, New Delhi.

Reference Books

1.William Stallings,(2002),"*Cryptography and Network Security- Principles and Practices*",3rd Edition, Pearson Education

2.Charles Pfleeger,(2006),"*Security In Computing*", 4th Edition, Prentice Hall Of India.

3.Charlie Kaufman and Radia Perlman, Mike Speciner,(2002*),"Network Security"*,2nd Edition, Private Communication in Public World, PHI.

E-Resources

- https://www.open.edu/openlearn/science-maths-technology/computing-and-ict/systems- computer/network-security/
- scs.carleton.ca/~paulv/5900wBooks.html
- https://www.intechopen.com/books/security-enhanced-applications-for-information-systems/cybersecurity-in-the-real-world

Course Outcomes

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

CO1	Recognize the different types of security attack
CO2	Understand the Substitution and Transposition Techniques
CO3	Use the Symmetric key Algorithms
CO4	Apply the Asymmetric Key Algorithms
CO5	Illustrate the Electronic Mail Security and IP Security

Mapping of Course Outcomes (COs) with Programme Specific Outcomes

	PSO 1	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**	**PSO 6**	**PSO 7**	**PSO 8**	**PSO 9**	**PSO 10**	**PSO 11**	**PSO 12**
CO 1	2	1	3	2	2	1	1	2	1	1	1	3
CO 2	2	2	3	2	3	1	2	1	1	1	1	3
CO 3	3	2	3	2	3	2	3	1	1	1	1	3
CO 4	3	2	3	2	3	2	3	2	1	1	1	3
C0 5	3	3	3	2	3	2	2	3	1	1	1	3

3.High; 2. Moderate ; 1. Low

Articulation Mapping - K Levels with Course Outcomes (COs)

Units	**COs**	**K-Level**	**Section A**	**Section B**	**Section C**
			MCQs	**Either/ or Choice**	**Open Choice**
			No. of Questions	**No. of Question**	**No. of Question**
1	CO1	Up to K2	2(K1& K2)	2(K1 & K1)	K1
2	CO2	Up to K2	2(K1 & K2)	2(K2 & K2)	K2
3	CO3	Up to K3	2(K1 & K2)	2(K3 & K3)	K3
4	CO4	Up to K2	2(K1& K2)	2(K2 & K2)	K2
5	CO5	Up to K3	2(K1& K2)	2(K3 & K3)	K3
No of Questions to be asked			10	10	5
No of Questions to be answered			10	5	3
Marks for each Question			1	4	10
Total marks for each Section			10	20	30

K1 – Remembering and recalling facts with specific answers

K2 – Basic understanding of facts and stating main ideas with general answers

K3 – Application oriented – Solving problems

Distribution of Section - wise Marks with K Levels

K Levels	Section A (No Choice)	Section B (Either/or)	Section C (Open Choice)	Total Marks	% of Marks without Choice	Consolidated (Rounded off)
K1	5	8	10	23	23	23%
K2	5	16	20	41	41	41%
K3		16	20	36	36	36%
Total Marks	10	40	50	100	100	100%

Lesson Plan

Unit I	**Attacks on Computer and Computer Security**	**8 Hours**	**Mode**
	a.Introduction-The need for security	**2**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b.Security Approaches	**2**	
	c. Principles of security	**2**	
	d. Types of Attacks	**2**	
Unit II	**Cryptography**	**12 Hours**	**Mode**
	a. Plain text and cipher text-Substitution Techniques	**4**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Transposition Techniques	**3**	
	c. Encryption and Decryption-Symmetric and Asymmetric key Cryptography	**3**	
	d.Steganography	**2**	
Unit III	**Symmetric key Algorithm**	**14 Hours**	**Mode**
	a. Introduction-Algorithm types and modes	**2**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b.Data Encryption Standard(DES)	**3**	
	c.International Data Encryption Algorithm(IDEA)	**3**	
	d.RC4-RC5-Blowfish	**3**	
	e. Advanced Encryption standard(AES).	**3**	
Unit IV	**Asymmetric key Algorithm**	**10 Hours**	**Mode**
	a. An overview of Asymmetric key Cryptography-RSA.	**3**	
	b. Symmetric and Asymmetric key cryptography together	**2**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	c. Digital Signature	**3**	
	d. knapsack Algorithm-Some other Algorithm	**2**	
Unit V	**IP Security**	**11 Hours**	**Mode**
	a. Introduction-Secure Socket Layer(SSL)	**2**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Transport Layer Security(TLS)-Secure Hyper Text transfer Protocol(SHTTP)	**3**	
	c. Time Stamping Protocol(TSP)-Secure Electronic Transaction(SET)-SSL versus SET.	**3**	
	d. Email Security	**3**	

Course designed by Mrs.S.Vijayalakshmi

Programme	**B.Sc.IT.**	**Programme Code**		**UIT**	
Course Code	**20UITE52**	**Number of Hours/Cycle**		**4**	
Semester	**V**	**Max. Marks**		**100**	
Part	**III**	**Credit**		**4**	
Core Elective I B					
Course Title	**Ethical Hacking**		**L**	**T**	**P**
Cognitive Level		**Up to K3**	**55**	**5**	**-**

Preamble

This Course is designed to provide basic knowledge of Ethical Hacking, Foot printing and scanning, Malware Threats and security.

Unit I	**An Introduction to ethical Hacking**	**10 Hours**
	Security Fundamental, Security testing, Hacker and Cracker, Descriptions, Test Plans-keeping It legal, Ethical and Legal it. The Technical Foundations of Hacking: The Attacker's Process, The Ethical Hacker's Process, Security and the Stack.	
Unit II	**Foot printing and scanning**	**11 Hours**
	Information Gathering, Determining the Network Range, Identifying Active Machines, Finding Open Ports and Access Points, OS Fingerprinting Services, Mapping the Network Attack Surface, Enumeration, System Hacking.	
Unit III	**Malware Threats and Sniffing**	**12 Hours**
	Viruses and Worms, Trojans, Covert Communication, Keystroke Logging and Spyware, Malware Counter measures, Sniffers, Session Hijacking, Denial of Service and Distributed Denial of Service.	
Unit IV	**Web Server Hacking & Mobile Security**	**11 Hours**
	Web Server Hacking, Web Application Hacking, Database Hacking, Wireless Technologies, Mobile Device Operation and Security, Wireless LANs.	
Unit V	**Firewalls and Social Engineering**	**11 Hours**
	Intrusion Detection Systems, Firewalls, Honeypots. Physical Security, Social Engineering, Cloud Computing, Botnets.	

Pedagogy

Class Room Lectures, chalkboards, Power point presentation, You Tube, Group Discussion, Seminar, Quiz, Assignments, Brain storming Activity.

Text Book

1. Sean-Philip Oriyano,(2016)," *Certified Ethical Hacker Version 9 study guide*",1St Edition, Sybex – Wiley.

Reference Books

1. Ric Messier,(2019)," *CEHv10, Certified EthicalHacker Study Guide*", 1St Edition, Sybex– Wiley.
2. Matt Walker(2012), *"All in One, CertifiedEthical Hacker"*,1St Edition, Tata McGraw Hill.
3. I.P. Specialist (2018)*" EC-CouncilCertified Ethical HackerComplete Training Guide"*, 1stEdition,Ipspecialist.

E-Resources

- . https://hackaday.com/
- . https://breakthesecurity.cysecurity.org/
- . https://www.eccouncil.org/programs/certified-ethical-hacker-ceh/

Course Outcomes

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

CO1	Understand the basics of the ethical hacking
CO2	Perform the foot printing and scanning
CO3	Determine the malware and their attacks to detect and prevent them
CO4	Explain the techniques for system hacking
CO5	Discover the security attacks in different environments

Mapping of Course Outcomes (COs) withProgramme Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	PSO11	PSO12
CO1	2	2	1	2	2	2	2	1	1	1	1	3
CO2	2	2	2	2	2	2	3	1	1	1	1	2
CO3	3	3	2	2	3	2	3	2	1	1	1	3
CO4	2	3	2	2	3	2	3	1	1	1	1	3
C05	3	3	2	3	1	2	3	2	2	1	1	3

3.High; 2. Moderate ; 1. Low

Articulation Mapping - K Levels with Course Outcomes (COs)

Units	**COs**	**K-Level**	**Section A**	**Section B**	**Section C**
			MCQs	**Either/ or Choice**	**Open Choice**
			No. of Questions	**No. of Question**	**No. of Question**
1	CO1	Up to K2	2(K1& K2)	2(K1 & K1)	K1
2	CO2	Up to K2	2(K1 & K2)	2(K2 & K2)	K2
3	CO3	Up to K3	2(K1 & K2)	2(K3 & K3)	K3
4	CO4	Up to K2	2(K1& K2)	2(K2 & K2)	K2
5	CO5	Up to K3	2(K1& K2)	2(K3 & K3)	K3
No of Questions to be asked			10	10	5
No of Questions to be answered			10	5	3
Marks for each Question			1	4	10
Total marks for each Section			10	20	30

K1 – Remembering and recalling facts with specific answers
K2 – Basic understanding of facts and stating main ideas with general answers
K3 – Application oriented – Solving problems

Distribution of Section - wise Marks with K Levels

K Levels	Section A (No Choice)	Section B (Either/or)	Section C (Open Choice)	Total Marks	% of Marks without Choice	Consolidated (Rounded off)
K1	5	8	10	23	23	23%
K2	5	16	20	41	41	41%
K3		16	20	36	36	36%
Total Marks	10	40	50	100	100	100%

Lesson Plan

Unit I	**An Introduction to ethical Hacking**	**10 Hours**	**Mode**
	a. Security Fundamental, Security testing	3	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Cracker, Descriptions, Test Plans-keeping	3	
	c. The Attacker's Process, The Ethical Hacker's Process	2	
	d. Security and the Stack.	2	
Unit II	**Foot printing and scanning**	**11 Hours**	**Mode**
	a. Information Gathering, Determining the Network Range	3	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Identifying Active Machines, Finding Open Ports and Access Points	2	
	c. OS Fingerprinting Services	2	
	d. Mapping the Network Attack Surface	2	
	e. Enumeration, System Hacking	2	
Unit III	**Malware Threats and Sniffing**	**12 Hours**	**Mode**
	a. Viruses and Worms, Trojans, Covert Communication	3	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Keystroke Logging and Spyware, Malware Counter measures	3	
	c. Sniffers, Session Hijacking	3	
	d. Denial of Service and Distributed Denial of Service	3	
Unit IV	**Web Server Hacking & Mobile Security**	**11 Hours**	**Mode**
	a. Web Server Hacking, Web Application Hacking.	3	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Database Hacking, Wireless Technologies	3	
	c. Mobile Device Operation and Security	3	
	d. Wireless LANs	2	
Unit V	**Firewalls and Social Engineering**	**11 Hours**	**Mode**
	a. Intrusion Detection Systems	3	Class room lectures, Power Point Presentation,
	b. Firewalls, Honey pots	3	
	c. Physical Security, Social Engineering	3	
	d. Cloud Computing, Botnets.	3	

Course designed by Mr.N.Thambirajan

Programme	**B.Sc.IT.**	**Programme Code**		**UIT**	
Course Code	**20UITE53**	**Number of Hours/Cycle**		**4**	
Semester	**V**	**Max. Marks**		**100**	
Part	**III**	**Credit**		**4**	
Core Elective Course III C					
Course Title	**Machine Learning**		**L**	**T**	**P**
Cognitive Level		**Upto K3**	**55**	**5**	**-**

Preamble

This Course is designed to provide basic knowledge of Machine Learning and its uses.

Unit I	**Introduction**	**11 Hours**
	What Is Learning? - When Do We Need Machine Learning? - Types of Learning - Relations to Other Fields - A Formal Model - Empirical Risk Minimization - Empirical Risk Minimization with Inductive Bias	
Unit II	**Learning Model**	**11 Hours**
	PAC Learning - More General Learning Model - Agnostic PAC Learning - Scope of Learning Problems Modeled - Uniform Convergence - No-Free-Lunch Theorem - Error Decomposition	
Unit III	**Non-uniform & Runtime of Learning**	**11 Hours**
	Nonuniform Learnability - Structural Risk Minimization - Minimum Description Length - Computational Complexity of Learning - Implementing the ERM Rule - Hardness of Learning	
Unit IV	**Linear Predictors & Boosting**	**11 Hours**
	Halfspaces - Linear Regression - Logistic Regression - Weak Learnability - AdaBoost - Linear Combinations of Base Hypotheses	
Unit V	**Decision Trees & Nearest Neighbor**	**11 Hours**
	Decision Trees: Sample Complexity - Decision Tree Algorithms - Random Forests - Nearest Neighbor: k Nearest Neighbors - Analysis - Efficient Implementation	

Pedagogy

Class Room Lectures, chalkboards, Power point presentation, You Tube, Group Discussion, Seminar, Quiz, Assignments, Brain storming Activity.

Text Book

1. ShaiShalev-Shwartz and Shai Ben-David,(2014),"*Understanding Machine Learning:From Theory to Algorithms*",Cambridge University Press.

Reference Books

1.DipanjanSarkar, Raghav Bali and TusharSharma , (2018),"*Practical Machine Learning with Python"* , Apress.

2. Nils J. Nilsson,(1998), "*Introduction to Machine Learning*", Stanford University

E-Resources

- . https://www.holehouse.org/mlclass/
- . https://www.gatevidyalay.com/machine-learning/
- . https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-867-machine-learning-fall-2006/lecture-notes/

Course Outcomes

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

CO1	Summarize the characteristics of machine learning .
CO2	Explain the types of machine learning models.
CO3	Discuss the different types of learning.
CO4	Classify linear and non-linear methods.
CO5	Illustrate various machine learning algorithms.

Mapping of Course Outcomes (COs) with Programme Specific Outcomes

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11	PSO 12
CO 1	2	2	2	1	2	1	3	2	1	1	1	3
CO 2	2	2	2	1	2	1	3	2	1	1	1	2
CO 3	2	1	2	2	2	2	3	1	1	1	1	3
CO 4	2	1	2	2	2	2	3	1	1	1	1	2
CO 5	2	1	2	2	1	2	3	2	1	1	1	3

3.High; 2. Moderate ; 1. Low

Articulation Mapping - K Levels with Course Outcomes (COs)

Units	**COs**	**K-Level**	**Section A**	**Section B**	**Section C**
			MCQs	**Either/ or Choice**	**Open Choice**
			No. of Questions	**No. of Question**	**No. of Question**
1	CO1	Up to K2	2(K1& K2)	2(K1 & K1)	K1
2	CO2	Up to K2	2(K1 & K2)	2(K1& K2)	K2
3	CO3	Up to K2	2(K1 & K2)	2(K2& K2)	K2
4	CO4	Up to K3	2(K1& K2)	2(K2& K3)	K3
5	CO5	Up to K3	2(K1& K2)	2(K3 & K3)	K3
No of Questions to be asked			10	10	5
No of Questions to be answered			10	5	3
Marks for each Question			1	4	10
Total marks for each Section			10	20	30

K1 – Remembering and recalling facts with specific answers

K2 – Basic understanding of facts and stating main ideas with general answers

K3 – Application oriented – Solving problems

Distribution of Section - wise Marks with K Levels

K Levels	Section A (No Choice)	Section B (Either/or)	Section C (Open Choice)	Total Marks	% of Marks without Choice	Consolidated (Rounded off)
K1	5	8	10	23	23	23%
K2	5	16	20	41	41	41%
K3		16	20	36	36	36%
Total Marks	10	40	50	100	100	100%

Lesson Plan

Unit I	**Introduction**	**11 Hours**	**Mode**
	a. What Is Learning? - When Do We Need Machine Learning?	2	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Types of Learning - Relations to Other Fields	3	
	c. A Formal Model - Empirical Risk Minimization	3	
	d. Empirical Risk Minimization with Inductive Bias	3	
Unit II	**Learning Model**	**11 Hours**	**Mode**
	a. PAC Learning - More General Learning Model	3	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Agnostic PAC Learning - Scope of Learning Problems Modeled	3	
	c. Uniform Convergence - No-Free-Lunch Theorem	3	
	d. Error Decomposition	2	
Unit III	**Non-uniform & Runtime of Learning**	**11 Hours**	**Mode**
	a. Non uniform Learn ability - Structural Risk Minimization	3	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Minimum Description Length	2	
	c. Computational Complexity of Learning	2	
	d. Implementing the ERM Rule	2	
	e. Hardness of Learning	2	
Unit IV	**Linear Predictors & Boosting**	**11 Hours**	**Mode**
	a. Half spaces - Linear Regression	2	Class room lectures, Power Point Presentation, Group Discussion
	a) b. Logistic Regression	2	
	c. Weak Learn ability	2	
	d. AdaBoost	2	
	e. Linear Combinations of Base Hypotheses	3	
Unit V	**Decision Trees & Nearest Neighbor**	**11 Hours**	**Mode**
	a. Sample Complexity	2	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Decision Tree Algorithms	2	
	c. Random Forests	2	
	d. k Nearest Neighbors	2	
	e. Analysis	1	
	f. Efficient Implementation	2	

Course designed by **Dr. C. Kirubakaran**

Programme	**B.Sc.It**	**Programme Code**		**UIT**	
Course Code	**20UITS5P**	**Number of Hours/Cycle**		2	
Semester	**V**	**Max. Marks**		**100**	
Part	**III**	**Credit**		**2**	
Skill Based Practical III					
Course Title	PHP and MYSQL-Lab		**L**	**T**	**P**
Cognitive Level		**Up to K3**	**-**	**-**	**30**

Preamble

To develop applications in PHP using various concepts like arrays, function, files and make the students to establish the connectivity between PHP and MySQL.

Program List:

1.Usage of array functions.
2.Creating user defined functions.
3. Creation of files.
4. File manipulation using PHP.
5. Creation of sessions.
6. Creation of cookies.
7. Creating simple applications using PHP.
8. Creating simple table with constraints.
9. Insertion, Updation and Deletion of rows in MYSQL tables.
10. Sorting and Searching of data by different criteria.
11. Demonstration of joining tables.
12. Database connectivity in PHP with MySQL.
13. Formatting the Output.

Course designed by M**rs.P.Chandrakala**

Programme	**B.Sc.IT.**	**Programme Code**		**UIT**	
Course Code	**20UITC61**	**Number of Hours/Cycle**		**4**	
Semester	**VI**	**Max. Marks**		**100**	
Part	**III**	**Credit**		**3**	
Core Course XI					
Course Title	**Introduction to GOLang Programming**		**L**	**T**	**P**
Cognitive Level		**Up to K3**	**55**	**5**	**-**

Preamble

This Course is designed to provide basic knowledge of Go language basics, functions, strings ,routines and RESTful APIs.

Unit I	**Introduction**	**10 Hours**
	Introduction to Go: Go and C – why Go? – Goroutine and Channel – selecting a Compiler – Creating a simple Go Program – The Go Type System – understanding the Memory Model. A Go Primer: The structure of a Go Source File – declaring Variables – Declaring Functions – Looping in Go – Creating Enumeration – Declaring Structures – Defining Methods – Implementing Interfaces – casting Types	
Unit II	**Go Essentials**	**10 Hours**
	Numbers: Converting between string and numbers using large integers – Converting between numbers and pointers. Common Go Patterns: Zero Initialization – Generic Data Structures – Specialized Generic data Structures - implementation Hiding – Type Embedding.Arrays and Slices: Creating Arrays – Slicing Arrays – Resizing Slices – Truncating Slices – Iterating Over Arrays.Manipulating Strings: Comparing String – Processing String One Character at a Time – Processing a Partial String – Splitting and Trimming String – Copying String – Creating String from Patterns – Matching Patterns in String.Working with Collections: Creating a Map – Storing Unordered Groups of Objects – Using Lists – Defining New Collections.	
Unit III	**Go routines**	**14 Hours**
	Handling Errors :Deferringcleanup – Panicking and recovering – Returning Error Values – Error Delegates. Goroutines :Creating Routines – synchronizing Goroutines – Waiting for a condition – performing Thread-safe Initialization – Performing Actions in the Background – Communicating Via Channels – Using Multiple Channels.Concurrency Design Patterns: Timing out Connections – Aliased xor mutable – Share memory by communicating – transactions by sharing channels – concurrent objects – implementing futures in Go – Coalescing Events – Map Reduce, Go Style. Dates and Times:Finding the Current Date – converting Dates for Display – Parsing Dates from String – calculating Elapsed Time – Receiving Timer Events.Accessing Files and the Environment: Manipulating Paths – Reading a File – Reading One Line at a Time – Determining if a File or Directory Exists – Checking Environment Variables.	
Unit IV	**REST API Development**	**11 Hours**
	Types of Web Services – Rest Verb and Status code – Rise of Rest API with single page Application – Setting up the project and running the development server - Building our first service – using Gulp for creating auto code compiling and	

	server reloading. Handling Routing for our Rest Services: Understanding Go's net/http package – Serve Mux, a basic router in Go – Introducing http router , a light weight router - Introducing Gorilla Mux , a Powerful HTTP router.	
Unit V	**RESTful services**	**10 Hours**
	Working with Middleware and RPC – Multiple middleware and Chaining – painless Middleware Chaining with Alice – What is RPC? – JSON RPC using Gorilla RPC - Simplifying RESTful services with popular Go Framework – CRUD operations and SQLite3 basics – Building RESTful APIs with the Gin framework - Building RESTful APIs with Revel.go	

Pedagogy

Class Room Lectures, Power point presentation, , Seminar, Quiz, Assignments

Text Book

1. David Chisnall., (2012), "*The Go Programming Language Phrase Book*", Addison Wesley , Second Edition.

2. NarenYellavula.,(2017)," *Building RESTful Web Services with Go",* Packt Publishing Ltd.

Reference Books

1.Caleb Doxsey.,(2012), "*An Introduction to programming in Go",* 2nd Edition, O'Reilly.

2.Caleb Doxsey,(2016), "*Introducing Go"*, 2nd Edition, O'Reilly Media, Inc.

3.Matt Aimonetti,(2014)"*Go Boot Camp",*Ardan Studios.

E-Resources

- **.**https://golang.org/
- **.**https//golangesources.com/
- **.**https//golang.cafe/

Course Outcomes

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

CO1	Understanding the basics of Golang.
CO2	Explain the Array and string concepts
CO3	Infer the concepts of Go routines
CO4	Create a simple RESTful API.
CO5	Apply CRUD concepts.

Mapping of Course Outcomes (COs) with Programme Specific Outcomes

	PSO 1	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**	**PSO 6**	**PSO 7**	**PSO 8**	**PSO 9**	**PSO 10**	**PSO 11**	**PSO 12**
CO 1	3	2	2	1	1	2	1	2	1	1	1	3
CO 2	3	2	3	3	1	2	2	2	2	1	1	3
CO 3	3	2	2	3	2	3	2	2	2	1	1	3
CO 4	3	3	2	3	1	2	2	3	2	1	1	3
C0 5	3	3	3	3	2	3	2	3	2	1	1	3

3.High; 2. Moderate ; 1. Low

Articulation Mapping - K Levels with Course Outcomes (COs)

Units	COs	K-Level	Section A	Section B	Section C
			MCQs	Either/ or Choice	Open Choice
			No. of Questions	No. of Question	No. of Question
1	CO1	Up to K2	2(K1& K2)	2(K1 & K1)	K1
2	CO2	Up to K2	2(K1 & K2)	2(K2 & K2)	K2
3	CO3	Up to K2	2(K1 & K2)	2(K2& K2)	K2
4	CO4	Up to K3	2(K1& K2)	2(K3 & K3)	K3
5	CO5	Up to K3	2(K1& K2)	2(K3 & K3)	K3
No of Questions to be asked			10	10	5
No of Questions to be answered			10	5	3
Marks for each Question			1	4	10
Total marks for each Section			10	20	30

K1 – Remembering and recalling facts with specific answers
K2 – Basic understanding of facts and stating main ideas with general answers
K3 – Application oriented – Solving problems

Distribution of Section - wise Marks with K Levels

K Levels	Section A (No Choice)	Section B (Either/or)	Section C (Open Choice)	Total Marks	% of Marks without Choice	Consolidated (Rounded off)
K1	5	8	10	23	23	23%
K2	5	16	20	41	41	41%
K3		16	20	36	36	36%
Total Marks	10	40	50	100	100	100%

Lesson Plan

Unit I	**Introduction**	**10Hours**	**Mode**
	a.Introduction to Go	**2**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b.A Go Primer.	**2**	
	c. Functions – Looping in Go	**3**	
	d. Structures& Interfaces.	**3**	
Unit II	**Go Essentials**	**10Hours**	**Mode**
	a. Numbers	**2**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Common Go patterns.	**2**	
	c. Array	**2**	
	d.Strings	**2**	
	e. Maps	**2**	
Unit III	**Go routines**	**14 Hours**	**Mode**
	a. Handling Errors	**3**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b.Goroutines.	**3**	
	c.Concurrency design patterns	**2**	
	d.Dates and Times.	**2**	
	e. Accessing Files and the Environment	**4**	
Unit IV	**REST API Development**	**11Hours**	**Mode**
	a. Types of Web Services	**2**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Handling Routing for our Rest Services.	**3**	
	c. Go's net/http package	**3**	
	d. http router	**3**	
Unit V	**RESTful services**	**10Hours**	**Mode**
	a. Middleware and RPC	**2**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Gorilla RPC	**2**	
	c. CRUD operations	**2**	
	d.Building RESTful APIs.	**3**	

Course designed by Mrs.P.Chandrakala

Programme	**B.Sc.IT.**	**Programme Code**		**UIT**	
Course Code	**20UITC6Q**			**3**	
Semester	**VI**	**Max. Marks**		**100**	
Part	**III**	**Credit**		**3**	
Core Practical IX					
Course Title	**GOLang -Lab**		**L**	**T**	**P**
Cognitive Level		**Up to K3**	**-**	**-**	**45**

Preamble

This Course is designed to provide basic knowledge of Go language basics, functions, strings , routines and RESTful APIs.

Program List:

1. Write a program to implement for loop.
2. Write a program to implement control structure.
3. Write a program to implement Functions.
4. Write a program to implement string operations.
5. Write a program to implement goroutine.
6. Write a program to find Date and Time.
7. Write a program to implement file concepts.
8. Write a program to implement net/http package.
9. Write a program for RPC.
10. Write a program to implement CURD operations.

Course designed by Mrs.P.Chandrakala

Programme	**B.Sc.IT**	**Programme Code**		**UIT**	
Course Code	**20UITC62**	**Number of Hours/Cycle**		**4**	
Semester	**VI**	**Max. Marks**		**100**	
Part	**III**	**Credit**		**3**	
Core Course XII					
Course Title	**Computer Graphics**		**L**	**T**	**P**
Cognitive Level		**Up to K3**	**55**	**5**	**-**

Preamble

This Course describes how to create and operate images using transformation and display methods with various algorithms.

Unit I	**Introduction and Overview**	**10 Hours**
	Video Display Devices - Raster-Scan System - Random-Scan Systems - Random-Scan Systems - Graphics Monitors and Workstations - Input Devices – Hard Copy Devices - Graphics Software	
Unit II	**Output Primitives**	**11 Hours**
	Points and Lines - Line Drawing Algorithms - Loading the Frame Buffer - Circle Generating Algorithms - Pixel Addressing - Filled-Area Primitives - Cell Array - Character Generation	
Unit III	**Attributes of Output Primitives**	**12 Hours**
	Line Attributes - Curve Attributes - Area-Fill Attributes - Character Attributes - Bundled Attributes - Inquiry Functions - Antialiasing	
Unit IV	**2D Geometric Transformations& 3D Concepts**	**11 Hours**
	Basic Transformations - Matrix Representations and Homogeneous Coordinates - Composite Transformations - Other Transformations - Transformations between Coordinate Systems **3D Concept:** Three-Dimensional Display Methods - Three-Dimensional Graphics	
Unit V	**GUI & Interactive Input Methods**	**11 Hours**
	The User Dialogue - Input of Graphical Data - Input Functions - Initial Values for Input-Device Parameters - Interactive Picture-Construction Techniques - Virtual-Reality Environments	

Pedagogy

Class Room Lectures, Power point presentation, , Seminar, Quiz, Assignments

Text Book

1. Donald Hearn & M. Pauline Baker, (2016),"*Computer Graphics C Version",* 2nd Edition, Pearson India Education Services Private Limited.

Reference Books

1.Edward Angel and Dave Shreiner, (2012). "*Interactive Computer Graphics: A top-down approach with OpenGL",* 6th Edition, Addison Wesley.

2.Foley, Van Dam, Feiner, Hughes, (2014), *"Computer Graphics Principles and Practice*", 3rd Edition, C. Addison Wesley.

3.V.Xiang and R.A. Plastock, (2002), "*Computer Graphics, Schaum's Outline Series*", Tata McGraw– Hill Publishing Co.

E-Resources

- **.**https://www.geektonight.com/computer-graphics-notes/
- **.** http://www.tutorialsspace.com/Download-Pdf-Notes/Computer-Graphics-Notes.aspx
- **.** https://backbencher.club/computer-graphics-and-visualization/

Course Outcomes

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

CO1	Identify the types of graphics monitors, workstations, input devices, and input technologies that you can use to work with graphics.
CO2	Understand the mathematical and heuristic algorithms in the back of the images item generation
CO3	Identify the attributes to manipulate the item designs and antializing strategies for correct display.
CO4	Apply the forms of 2D transformations, 3D transformations and its mapping process
CO5	Construct the algorithms for 3-d item modelling and processing

Mapping of Course Outcomes (COs) with Programme Specific Outcomes

	PSO 1	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**	**PSO 6**	**PSO 7**	**PSO 8**	**PSO 9**	**PSO 10**	**PSO 11**	**PSO 12**
CO 1	3	2	2	1	2	1	1	1	1	1	1	2
CO 2	3	2	3	2	2	1	3	2	1	1	1	2
CO 3	3	2	2	2	2	2	2	1	1	1	1	3
CO 4	3	2	2	2	2	2	3	2	1	2	1	3
C0 5	3	3	2	2	1	2	3	1	1	1	1	3

3.High; 2. Moderate ; 1. Low

Articulation Mapping - K Levels with Course Outcomes (COs)

Units	**COs**	**K-Level**	**Section A**	**Section B**	**Section C**
			MCQs	**Either/ or Choice**	**Open Choice**
			No. of Questions	**No. of Questions**	**No. of Questions**
1	CO1	Up to K2	2(K1& K2)	2(K1 & K1)	1(K1)
2	CO2	Up to K2	2(K1 & K2)	2(K2& K2)	1(K2)
3	CO3	Up to K2	2(K1 & K2)	2(K2& K2)	1(K2)
4	CO4	Up to K3	2(K1& K2)	2(K3& K3)	1(K3)
5	CO5	Up to K3	2(K1& K2)	2(K3 & K3)	1(K3)
No of Questions to be asked			10	10	5
No of Questions to be answered			10	5	3
Marks for each Question			1	4	10
Total marks for each Section			10	20	30

K1 – Remembering and recalling facts with specific answers

K2 – Basic understanding of facts and stating main ideas with general answers

K3 – Application oriented – Solving problems

Distribution of Section - wise Marks with K Levels

K Levels	Section A (No Choice)	Section B (Either/or)	Section C (Open Choice)	Total Marks	% of Marks without Choice	Consolidated (Rounded off)
K1	5	8	10	23	23	23%
K2	5	16	20	41	41	41%
K3		16	20	36	36	36%
Total Marks	10	40	50	100	100	100%

Lesson Plan

Unit I	**Introduction and Overview**	**10Hours**	**Mode**
	a. Video Display Devices	**3**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Raster and Random-Scan System	**3**	
	c. Graphics Monitors and Workstations - Input Devices	**2**	
	d. Hard Copy Devices - Graphics Software	**2**	
Unit II	**Output Primitives**	**11 Hours**	**Mode**
	a. Points and Lines - Line Drawing Algorithms	**2**	Class room lectures, Power Point Presentation,
	b. Loading the Frame Buffer - Circle Generating Algorithms	**3**	
	c. Pixel Addressing - Filled-Area Primitives	**3**	
	d. Cell Array - Character Generation	**3**	
Unit III	**Attributes of Output Primitives**	**12 Hours**	**Mode**
	a. Line Attributes - Curve Attributes	**3**	Class room lectures, Power Point Presentation,
	b. Area-Fill Attributes - Character Attributes	**3**	
	c. Bundled Attributes	**3**	
	d. Inquiry Functions - Antialiasing	**3**	
Unit IV	**2D Geometric Transformations& 3D Concepts**	**11 Hours**	**Mode**
	a. Basic Transformations - Matrix Representations and Homogeneous Coordinates	**3**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Composite Transformations - Other Transformations	**3**	
	c. Transformations between Coordinate Systems	**3**	
	d. Three-Dimensional Display Methods - Three-Dimensional Graphics	**2**	
Unit V	**GUI & Interactive Input Methods**	**11 Hours**	**Mode**
	a. The User Dialogue - Input of Graphical Data	**2**	Class room lectures, Power Point Presentation,
	b. Input Functions - Initial Values for Input	**3**	
	c. Device Parameters - Interactive Picture	**3**	
	d. Construction Techniques - Virtual-Reality Environments	**3**	

Course designed by Mrs.R.Gunasundari

Programme	**B.Sc.IT.**	**Programme Code**		**UIT**	
Course Code	**20UITC6R**	**Number of Hours/Cycle**		**3**	
Semester	**VI**	**Max. Marks**		**100**	
Part	**III**	**Credit**		**3**	
Core Practical X					
Course Title	**Computer Graphics**		**L**	**T**	**P**
Cognitive Level		**Up to K3**	**-**	**-**	**45**

Preamble

To enable the students to familiar with python programming basics, Functions, Strings, Lists, Classes and Objects.

Program List:

1.Draw the following basic shapes in the screen :
i. Circle ii. Rectangle iii. Square iv. Concentric Circles v. Ellipse vi. Line
2.Develop the program for DDA Line drawing algorithm.
3.Develop the program for Bresenham's Line drawing algorithm.
4.Develop the program for the mid-point circle drawing algorithm.
5. Write a program to implement 2D scaling.
6. Write a program to perform 2D translation
7.Perform 2D Rotation on a given object.
8. Write a program to fill a circle using Flood Fill Algorithm.
9. Write a program to fill a circle using Boundary Fill Algorithm.
10. Develop a simple text screen saver using graphics functions.
11. Perform smiling face animation using graphic functions..
12. Draw the moving car on the screen.

Course designed by Mrs.R.Gunasundari

Programme	**B.Sc.IT.**	**Programme Code**		**UIT**	
Course Code	**20UITC63**	**Number of Hours/Cycle**		**4**	
Semester	**VI**	**Max. Marks**		**100**	
Part	**III**	**Credit**		**3**	
Core Course XIII					
Course Title	**Big Data Analytics**		**L**	**T**	**P**
Cognitive Level		**Up to K3**	**55**	**5**	**-**

Preamble

To know the fundamental concepts of big data and analytics, explore tools and practices for working with big data. To know about the research that requires the integration of large amounts of data.

Unit I	**Introduction to Big Data**	**10 Hours**
	Evolution of Big data - Best Practices for Big data Analytics - Big data characteristics - Validating - The Promotion of the Value of Big Data - Big Data Use Cases- Characteristics of Big Data Applications - Perception and Quantification of Value -Understanding Big Data Storage - A General Overview of High Performance -Architecture - HDFS - MapReduce and YARN - Map Reduce Programming Mode.	
Unit II	**Clustering and Classification**	**13 Hours**
	Advanced Analytical Theory and Methods: Overview of Clustering - K-means - Use Cases - Overview of the Method - Determining the Number of Clusters - Diagnostics - Reasons to Choose and Cautions .- Classification: Decision Trees - Overview of a Decision Tree - The General Algorithm - Decision Tree Algorithms - Evaluating a Decision Tree - Decision Trees in R - Naïve Bayes - Bayes‘ Theorem - Naïve Bayes Classifier.	
Unit III	**Association and Recommendation System**	**10 Hours**
	Association Rules - Overview - Apriori Algorithm - Evaluation of Candidate Rules - Applications of Association Rules - Finding Association& finding similarity - Recommendation System: Collaborative Recommendation- Content Based Recommendation - Knowledge Based Recommendation- Hybrid Recommendation Approaches.	
Unit IV	**Stream Memory**	**11 Hours**
	Introduction to Streams Concepts – Stream Data Model and Architecture - Stream Computing, Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream – Estimating moments – Counting oneness in a Window – Decaying Window – Real time Analytics Platform(RTAP) applications - Case Studies - Real Time Sentiment Analysis, Stock Market Predictions. Using Graph Analytics for Big Data: Graph Analytics	
Unit V	**NoSQL data management for Bigdata and Data Visualization**	**11 Hours**
	NoSQL Databases : Schema-less Models‖: Increasing Flexibility for Data Manipulation-Key Value Stores- Document Stores - Tabular Stores - Object Data Stores - Graph Databases Hive - Sharding –- Hbase – Analyzing big data with twitter - Big data for E-Commerce Big data for blogs - Review of Basic Data Analytic Methods using R.	

Pedagogy

Class Room Lectures, Power point presentation, , Seminar, Quiz, Assignments.

Text Book

1.AnandRajaraman and Jeffrey David Ullman(2012), "*Mining of Massive Datasets*", Cambridge University Press,.

2.DavidLoshin,Morgan Kaufmann(2013), "*Big Data Analytics: From Strategic Planning to Enterprise Integration with Tools, Techniques, NoSQL, and Graph*", Elsevier Publishers.

Reference Books

1.EMC Education Services, (2015), "*Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data*", Wiley publishers.

2.Bart Baesens,(2015), "*Analytics in a Big Data World: The Essential Guide to Data Science and its Applications*", Wiley Publishers.

3.Kim H. Pries and Robert Dunnigan,(2015), "*Big Data Analytics: A Practical Guide for Managers* " CRC Press.

E-Resources

- **.**https://www.sas.com/en_us/insights/analytics/big-data-analytics.htmlSWAYAM: Massive Open Online Courses
- **.** e-Yantra: Engineering for Better Tomorrow: new.e-yantra.org
- **.** NPTEL Video Lectures : iitbbs.ac.in/nptel-courses.php

Course Outcomes

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

CO1	Work with big data platform and Understand the fundamentals of various big data analysis techniques
CO2	Analyze the big data analytic techniques for useful business applications.
CO3	Design efficient algorithms for mining the data from large volumes.
CO4	Analyze the HADOOP and Map Reduce technologies associated with big data analytics
CO5	Explore the applications of Big Data

Mapping of Course Outcomes (COs) withProgramme Specific Outcomes

	PSO 1	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**	**PSO 6**	**PSO 7**	**PSO 8**	**PSO 9**	**PSO 10**	**PSO 11**	**PSO 12**
CO 1	3	3	2	2	3	2	2	2	1	1	1	2
CO 2	3	3	3	2	2	2	2	2	1	1	1	3
CO 3	3	3	2	2	2	2	3	2	1	1	1	2
CO 4	2	2	2	2	3	2	2	2	1	1	1	3
C0 5	2	3	2	3	2	3	3	1	1	1	1	3

3.High; 2. Moderate ; 1. Low

Articulation Mapping - K Levels with Course Outcomes (COs)

Units	COs	K-Level	Section A	Section B	Section C
			MCQs	Either/ or Choice	Open Choice
			No. of Questions	No. of Question	No. of Question
1	CO1	Up to K2	2(K1& K2)	2(K1 & K1)	K1
2	CO2	Up to K2	2(K1 & K2)	2(K2 & K2)	K2
3	CO3	Up to K3	2(K1 & K2)	2(K3 & K3)	K3
4	CO4	Up to K2	2(K1& K2)	2(K2 & K2)	K2
5	CO5	Up to K3	2(K1& K2)	2(K3 & K3)	K3
No of Questions to be asked			10	10	5
No of Questions to be answered			10	5	3
Marks for each Question			1	4	10
Total marks for each Section			10	20	30

K1 – Remembering and recalling facts with specific answers
K2 – Basic understanding of facts and stating main ideas with general answers
K3 – Application oriented – Solving problems

Distribution of Section - wise Marks with K Levels

K Levels	Section A (No Choice)	Section B (Either/or)	Section C (Open Choice)	Total Marks	% of Marks without Choice	Consolidated (Rounded off)
K1	5	8	10	23	23%	23%
K2	5	16	20	41	41%	41%
K3		16	20	36	36%	36%
Total Marks	10	40	50	100	100%	100%

Lesson Plan

Unit I	**Introduction to Big Data**	**10Hours**	**Mode**
	a. Best Practices for Big data Analytics.	**4**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Characteristics of Big Data	**4**	
	c. Applications	**2**	
Unit II	**Clustering and Classification**	**13 Hours**	**Mode**
	a. Advanced Analytical Theory and Methods	**4**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Classification	**4**	
	c. The General Algorithm	**5**	
Unit III	**Association and Recommendation System**	**10 Hours**	**Mode**
	a. Association Rules	**3**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Recommendation System	**3**	
	c. Naïve Bayes	**4**	
Unit IV	**Stream Memory**	**11 Hours**	**Mode**
	a. Introduction to Streams Concepts	**3**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Real time Analytics Platform	**4**	
	c. Using Graph Analytics for Big Data	**4**	
Unit V	**NoSQL data management for Bigdata and Data Visualization**	**11 Hours**	**Mode**
	a. NoSQL Databases	**3**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Graph Databases Hive	**4**	
	c. Review of Basic Data Analytic Methods using R	**4**	

Course designed by Mrs.R.Gunasundari

Programme	**B.Sc.IT.**	**Programme Code**		**UIT**	
Course Code	**20UITE61**	**Number of Hours/Cycle**		**4**	
Semester	**V**	**Max. Marks**		**100**	
Part	**III**	**Credit**		**4**	
Core Elective Course II A					
Course Title	**Cloud Computing**		**L**	**T**	**P**
Cognitive Level	**Up to K3**		**55**	**5**	**-**

Preamble

To enable the students to understand the concepts of Cloud computing technologies and recent trends.

Unit I	**Cloud Infrastructure**	**10 Hours**
	Scalable Computing over the Internet - Technologies for Network based Systems - System Models for Distributed and Cloud Computing -NIST Cloud Computing Reference Architecture-Cloud Computing and Services Model - Public, Private and Hybrid Clouds - Cloud Eco System - IaaS - PaaS - SaaS	
Unit II	**Virtualization structure**	**10 Hours**
	Implementation Levels of Virtualization - Virtualization Structures - Tools and Mechanisms -Virtualization of CPU, Memory, I/O Devices - Virtual Clusters and Resource Management - Virtualization for Data-Center Automation	
Unit III	**Cloud System Mode**	**14 Hours**
	Architectural Design of Compute and Storage Clouds - Layered Cloud Architecture Development- Design Challenges - Public Cloud Platforms- GAE, AWS, and Azure- Inter Cloud Resource Management- VM Management - Resource Provisioning and Platform Deployment - Global Exchange of Cloud Resources - Cloud Security and Trust Management.	
Unit IV	**Resource Management and Security in Cloud**	**11 Hours**
	Inter Cloud Resource Management -Resource Provisioning Methods- Global Exchange of Cloud Resources - Security Overview -Cloud Security Challenges – Software as a Service Security -Security Governance -Virtual Machine Security -IAM - Security Standards.	
Unit V	**Cloud Technologies and Advancements**	**10 Hours**
	Hadoop - MapReduce- Virtual Box - Google App Engine -Programming Environment for Google App Engine - Open Stack - Federation in the Cloud - Four Levels of Federation - Federated Services and Applications - Future of Federation.	

Pedagogy

Class Room Lectures, chalkboards, Power point presentation, You Tube, Group Discussion, Seminar, Quiz, Assignments, Brain storming Activity.

Text Book

1.Kai Hwang, Geoffrey C Fox, Jack G Dongarra, (2012), "*Distributed and Cloud Computing, From Parallel Processing to the Internet of Things*", Morgan Kaufmann Publishers.

2.Ronald L. Krutz, Russell Dean Vines, (2010), "*Cloud Security – A comprehensive Guide to Secure Cloud Computing*", Wiley – India.

Reference Books

1.John W.Rittinghouse and James F.Ransome, (2010), "*Cloud Computing: Implementation, Management, and Security*", CRC Press.

2.George Reese, (2009), "*Cloud Application Architectures: Building Applications and Infrastructure in the Cloud*" O'Reilly.
3.RajkumarBuyya, Christian Vecchiola, S.TamaraiSelvi, (2013), "*Mastering Cloud Computing*", TMGH.

E-Resources

- **.**http://whatiscloud.com/basic_concepts_and_terminology/cloud
- . http://www.csoonline.com/article/2125258/cloud-security/cloud-security--the-basics.html
- . http://thecloudtutorial.com/freecloudcomputingapplications.html

Course Outcomes

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

CO1	Discuss virtualization for efficient resource utilization
CO2	Explore cloud computing models and services
CO3	Apply cloud platforms for different applications
CO4	Explain various services using cloud programming models
CO5	Illustrate to install and use current cloud technologies.

Mapping of Course Outcomes (COs) with Programme Specific Outcomes

	PS01	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**	**PSO7**	**PSO8**	**PSO9**	**PSO10**	**PSO11**	**PSO12**
CO1	3	2	3	3	1	2	2	2	1	1	1	3
CO2	2	2	2	2	2	1	2	2	1	1	1	2
CO3	2	3	2	2	2	2	3	2	1	1	1	3
CO4	3	3	2	2	2	1	3	2	1	1	1	2
C05	2	3	2	3	2	2	3	2	1	1	1	2

3.High; 2. Moderate ; 1. Low

Articulation Mapping - K Levels with Course Outcomes (COs)

Units	**COs**	**K-Level**	**Section A**	**Section B**	**Section C**
			MCQs	**Either/ or Choice**	**Open Choice**
			No. of Questions	**No. of Question**	**No. of Question**
1	CO1	Up to K2	2(K1& K2)	2(K1 & K1)	1(K1)
2	CO2	Up to K2	2(K1 & K2)	2(K1 & K1)	1(K2)
3	CO3	Up to K3	2(K1 & K2)	2(K2 & K2)	1(K3)
4	CO4	Up to K2	2(K1& K2)	2(K2 & K2)	1(K2)
5	CO5	Up to K3	2(K1& K2)	2(K3 & K3)	1(K3)
No of Questions to be asked			10	10	5
No of Questions to be answered			10	5	3
Marks for each Question			1	4	10
Total marks for each Section			10	20	30

K1 – Remembering and recalling facts with specific answers
K2 – Basic understanding of facts and stating main ideas with general answers
K3 – Application oriented – Solving problems
Distribution of Section - wise Marks with K Levels

K Levels	Section A (No Choice)	Section B (Either/or)	Section C (Open Choice)	Total Marks	% of Marks without Choice	Consolidated (Rounded off)
K1	5	16	10	23	23	36%
K2	5	16	20	41	41	41%
K3		8	20	36	36	23%
Total Marks	10	40	50	100	100	100%

Lesson Plan

Unit I	**Cloud Infrastructure**	**10Hours**	**Mode**
	a.Scalable Computing over the Internet	**2**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b.NIST Cloud Computing Reference Architecture	**4**	
	c. Cloud Eco System	**4**	
Unit II	**Visualization Structure**	**10 Hours**	**Mode**
	a. Implementation Levels of Virtualization	**4**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Virtual Clusters and Resource Management	**6**	
Unit III	**Cloud System Model**	**14 Hours**	**Mode**
	a. Architectural Design of Compute and Storage Clouds	**2**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b.Public Cloud Platforms	**2**	
	c.Resource Provisioning and Platform Deployment	**6**	
	d.Cloud Security and Trust Management	**4**	
Unit IV	**Resource Management and Security in Cloud**	**11 Hours**	**Mode**
	a. Inter Cloud Resource Management .	**3**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Security Overview	**4**	
	c. Virtual Machine Security	**4**	
Unit V	**Cloud Technologies and Advancements**	**10 Hours**	**Mode**
	a. Hadoop	**2**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Google App Engine	**4**	
	c. Federation in the Cloud	**4**	

Course designed by Mrs.Mrs.R.Gunasundari

Programme	**B.Sc.IT**	**Programme Code**		**UIT**	
Course Code	**20UITE62**	**Number of Hours/Cycle**		**4**	
Semester	**VI**	**Max. Marks**		**100**	
Part	**III**	**Credit**		**4**	
Core Elective Course Ii B					
Course Title	**Internet of Things**		**L**	**T**	**P**
Cognitive Level	**Upto K3**		**55**	**5**	**-**

Preamble

This Course is designed to provide basic knowledge of Internet of Things and its applications.

Unit I	**Introduction**	12 Hours
	Definition & Characteristics of IoT - Things in IoT - IoT Protocols - IoT Communication Models - IoT Communication APIs - Wireless Sensor Networks - Cloud Computing - Big Data Analytics - Communication Protocols - Embedded Systems	
Unit II	**Domain Specific IoTs**	9 Hours
	Home Automation – Cites – Environment – Energy – Retail – Logistic – Agriculture – Industry – Health – Lifestyle	
Unit III	**IoT System Management with NETCONF_YANG**	11 Hours
	IoT system management - simple network management protocol (SNMP) - limitation of SNMP - Network Operator Requirement - NETCONF - YANG – NETOPEER	
Unit IV	**Developing Internet of Things**	12 Hours
	Purpose & Requirements Specification - Process Specification - Domain Model Specification - Information Model Specification - Service Specifications - IoT Level Specification - Functional View Specification - operational View Specification - Device & Component Integration - Application Development	
Unit V	**Searching the Internet of Things**	11 Hours
	A Search Architecture for Social and Physical Sensors - Local Event Retrieval - Sensor Metadata Streams - Venue Recommendation	

Pedagogy

Class Room Lectures, chalkboards, Power point presentation, You Tube, Group Discussion, Seminar, Quiz, Assignments, Brain storming Activity.

Text Book

1.ArshdeepBahga and Vijay Madisetti,(2015), "*Internet of Things-A hands -Approachs*" Universities Press.

2.John Soldatos, (2017), "*Building Blocks for IoT Analytics Internet-of-Things Analytics*" River Publishers.

Reference Books

1. Peter Waher(2015), "*Learning Internet of Things*" ,Packt Publishing.

2. Peter Friess, (2014), "*Internet of Things – From Research and Innovation to Market Deployment*", River Publishers.

3.N. Ida , (2014), "*Sensors, Actuators and Their Interfaces* ", SciTech Publishers.

Resources

- . https://www.disruptive-technologies.com/blog/a-beginners-guide-to-the-internet-of-things-iot-2021
- .https://saividya.ac.in/study-material-cse.html

- http://www.olevelexam.com/study-materials-for-internet-of-things-and-its-applications

Course Outcomes

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

CO1	Understand the fundamentals of IoT.
CO2	Summarize the applications of IoT.
CO3	Describe style methodology and protocols of IoT.
CO4	Illustrate the various specifications of IoT.
CO5	Explain the role of sensors in IoT.

Mapping of Course Outcomes (COs) with Programme Specific Outcomes

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10	PSO 11	PSO 12
CO 1	2	2	2	1	2	1	1	3	1	1	1	3
CO 2	2	2	2	2	2	1	2	3	1	1	1	2
CO 3	2	3	2	2	2	2	2	3	1	1	1	3
CO 4	3	3	2	2	2	2	2	3	1	1	1	2
C0 5	2	3	2	3	2	2	2	3	1	1	1	3

3.High; 2. Moderate ; 1. Low

Articulation Mapping - K Levels with Course Outcomes (COs)

Units	**COs**	**K-Level**	**Section A**	**Section B**	**Section C**
			MCQs	**Either/ or Choice**	**Open Choice**
			No. of Questions	**No. of Question**	**No. of Question**
1	CO1	Up to K2	2(K1& K2)	2(K1 & K1)	K1
2	CO2	Up to K2	2(K1 & K2)	2(K2& K2)	K2
3	CO3	Up to K2	2(K1 & K2)	2(K2& K2)	K2
4	CO4	Up to K3	2(K1& K2)	2(K2& K3)	K3
5	CO5	Up to K3	2(K1& K2)	2(K3 & K3)	K3
No of Questions to be asked			10	10	5
No of Questions to be answered			10	5	3
Marks for each Question			1	4	10
Total marks for each Section			10	20	30

K1 – Remembering and recalling facts with specific answers

K2 – Basic understanding of facts and stating main ideas with general answers

K3 – Application oriented – Solving problems

Distribution of Section - wise Marks with K Levels

K Levels	Section A (No Choice)	Section B (Either/or)	Section C (Open Choice)	Total Marks	% of Marks without Choice	Consolidated (Rounded off)
K1	5	8	10	23	23	23%
K2	5	16	20	41	41	41%
K3		16	20	36	36	36%
Total Marks	10	40	50	100	100	100%

Lesson Plan

Unit I	**Introduction**	**12 Hours**	Mode
	a. Definition & Characteristics of IoT - Things in IoT	**2**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. IoT Protocols - IoT Communication Models	**3**	
	c. IoT Communication APls - Wireless Sensor Networks - Cloud Computing	**3**	
	d. Big Data Analytics - Communication Protocols - Embedded Systems	**4**	
Unit II	**Domain Specific IoTs**	**9 Hours**	Mode
	a. Home Automation – Cites	**1**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Environment – Energy	**2**	
	c. Retail – Logistic	**2**	
	d. Agriculture – Industry	**2**	
	e. Health – Lifestyle	**2**	
Unit III	**IoT System Management with NETCONF_YANG**	**11 Hours**	Mode
	a. IoT system management	**2**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. simple network management protocol (SNMP)	**3**	
	c. limitation of SNMP - Network Operator Requirement	**2**	
	d. NETCONF – YANG,NETOPEER	**4**	
Unit IV	**Developing Internet of Things**	**12 Hours**	Mode
	a. Purpose & Requirements Specification - Process Specification	**2**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Domain Model Specification - Information Model Specification	**2**	
	c. Service Specifications - IoT Level Specification	**2**	
	d. Functional View Specification - operational View Specification	**2**	
	e. Device & Component Integration	**2**	
	f. Application Development	**2**	
Unit V	**Searching the Internet of Things**	**11 Hours**	Mode
	a. A Search Architecture for Social and Physical Sensors	**3**	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Local Event Retrieval	**2**	
	c. Sensor Metadata Streams	**3**	
	d. Venue Recommendation.	**3**	

Course designed by **Dr. C. Kirubakaran**

Programme	**B.Sc.IT**	**Programme Code**		**UIT**	
Course Code	**20UITE63**	**Number of Hours/Cycle**		**4**	
Semester	**VI**	**Max. Marks**		**100**	
Part	**III**	**Credit**		**4**	
Core Elective Course II C					
Course Title	**Theory of Computation**		**L**	**T**	**P**
Cognitive Level		**Up to K3**	**55**	**5**	**-**

Preamble

This Course is designed to provide basic knowledge of solve problems in computing, hierarchy of problems, context free grammar and its applications.

Unit I	**Introduction**	**10 Hours**
	Automata theory - Computability theory - Complexity theory - Sets - Sequences and tuples - Functions and relations - Graphs - Strings and languages - Boolean logic - Definitions, Theorems, and Proofs - Types of Proof	
Unit II	**Automata and Languages - Regular Languages**	**11 Hours**
	Finite Automata: Formal definition of a finite automaton - Formal definition of computation - Designing finite automata - The regular operations - **Nondeterminism:** Formal definition of a nondeterministic finite automaton - Equivalence of NFAs and DFAs - Closure under the regular operations - **Regular Expressions:** Formal definition of a regular expression - Equivalence with finite automata - **Nonregular Languages:** The pumping lemma for regular languages	
Unit III	**Automata and Languages: Context-Free Languages**	**12 Hours**
	Context-Free Grammars - Formal definition of a context-free grammar - Examples of context-free grammars - Designing context-free grammars - Ambiguity - Chomsky normal form - Pushdown Automata - Formal definition of a pushdown automaton - Examples of pushdown automata - Equivalence with context-free grammars - Non-Context-Free Languages - The pumping lemma for context-free languages - Deterministic Context-Free Languages - Properties of DCFLs - Deterministic context-free grammars	
Unit IV	**Computability Theory**	**11Hours**
	Turing Machines - Formal definition of a Turing machine – Multi tape Turing machines - Nondeterministic Turing machines - Enumerators - Equivalence with other models - Hilbert's problems - Terminology for describing Turing machines	
Unit V	**Decidability**	**11 Hours**
	Decidable Languages - Decidable problems concerning regular languages - Decidable problems concerning context-free languages - Undecidability - The diagonalization method - An undecidable language - A Turing-unrecognizable language	

Pedagogy

Class Room Lectures, chalkboards, Power point presentation, You Tube, Group Discussion, Seminar, Quiz, Assignments, Brain storming Activity.

Text Book

1.Johne.Hopcroft, Rajeevmtwani and Jeffreyd . Ullman, (2013), "*Introduction to Automata theory, Languages, and Computation*", 3 rdedition, Pearson Education.

Reference Books

1. K. L. P Mishra, N. Chandrashekaran (2003), "*Theory of Computer Science-Automata Languages and Computation*, 2nd edition, Prentice Hall of India, India.
2. Peter Linz, Jones & Bartlett, (2016), "*Introduction To Formal Languages And Automata*", 6Th Edn, Jones & Bartlett publishers.
3. M. JanakiMeena and S. N. Sivanandam, (2009), "*Theory of Computation*", Kindle Edition

E-Resources

- https://muthaneha88.wordpress.com/toc-unit-wise-study-material/
- https://www.aminotes.com/2017/05/theory-of-computation-notes.html
- https://www.geektonight.com/theory-of-computation-notes/

Course Outcomes

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

CO1	Understand finite state machines to solve problems in computing
CO2	Explain the hierarchy of problems arising in the computer sciences
CO3	Describe automata for any given pattern and find its equivalent regular expressions
CO4	Construct a context free grammar for any given language
CO5	Illustrate Turing machines and undecidable problems

Mapping of Course Outcomes (COs) with Programme Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	PSO11	PSO12
CO1	2	2	3	1	2	2	3	1	1	1	1	3
CO2	2	2	3	1	2	2	3	1	1	1	1	2
CO3	2	2	3	2	2	2	3	1	1	1	1	3
CO4	2	2	3	2	2	2	3	1	1	1	1	2
C05	2	2	3	2	1	2	3	1	1	1	1	3

3.High; 2. Moderate ; 1. Low

Articulation Mapping - K Levels with Course Outcomes (COs)

Units	COs	K-Level	Section A	Section B	Section C
			MCQs	Either/ or Choice	Open Choice
			No. of Questions	No. of Question	No. of Question
1	CO1	Up to K2	2(K1& K2)	2(K1 & K1)	K1
2	CO2	Up to K2	2(K1 & K2)	2(K2& K2)	K2
3	CO3	Up to K2	2(K1 & K2)	2(K2& K2)	K2
4	CO4	Up to K3	2(K1& K2)	2(K2& K3)	K3
5	CO5	Up to K3	2(K1& K2)	2(K3 & K3)	K3
No of Questions to be asked			10	10	5
No of Questions to be answered			10	5	3
Marks for each Question			1	4	10
Total marks for each Section			10	20	30

K1 – Remembering and recalling facts with specific answers
K2 – Basic understanding of facts and stating main ideas with general answers
K3 – Application oriented – Solving problems

Distribution of Section - wise Marks with K Levels

K Levels	Section A (No Choice)	Section B (Either/or)	Section C (Open Choice)	Total Marks	% of Marks without Choice	Consolidated (Rounded off)
K1	5	8	10	23	23	23%
K2	5	16	20	41	41	41%
K3		16	20	36	36	36%
Total Marks	10	40	50	100	100	100%

Lesson Plan

Unit I	**Introduction**	10 Hours	Mode
	a. Automata theory - Computability theory	2	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Complexity theory - Sets - Sequences and tuples - Functions and relations	3	
	c. Graphs - Strings and languages - Boolean logic	2	
	d. Definitions, Theorems, and Proofs - Types of Proof	3	
Unit II	**Automata and Languages - Regular Languages**	11 Hours	Mode
	a. Formal definition of a finite automaton - Formal definition of computation	3	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Designing finite automata - The regular operations - Formal definition of a nondeterministic finite automaton	3	
	c. Equivalence of NFAs and DFAs - Closure under the regular operations - Formal definition of a regular expression	3	
	d. Equivalence with finite automata - The pumping lemma for regular languages	2	
Unit III	**Automata and Languages: Context-Free Languages**	12 Hours	Mode
	a. Context-Free Grammars - Formal definition of a context-free grammar with Examples	3	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Designing context-free grammars - Ambiguity - Chomsky normal form -	2	
	c. Pushdown automaton	3	
	d. Non-Context-Free Languages - The pumping lemma for context-free languages	2	
	e. Deterministic Context-Free Languages - Properties of DCFLs - Deterministic context-free grammar	2	
Unit IV	**Computability Theory**	11 Hours	Mode
	a. Turing Machines - Formal definition of a Turing machine	2	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Multitple Turing machines - Nondeterministic Turing machines	3	
	c. Enumerators - Equivalence with other models - Hilbert's problems	3	
	d. Terminology for describing Turing machines	3	
Unit V	**Decidability**	11 Hours	Mode
	a. Decidable Languages - Decidable problems concerning regular languages	2	Class room lectures, Power Point Presentation, Group Discussion, Seminar, Quiz
	b. Decidable problems concerning context-free languages	3	
	c. Undecidability - The diagonalization method	3	
	d. An undecidable language - A Turing-unrecognizable language.	3	

Course designed by **Dr. C. Kirubakaran**

Programme	**B.Sc IT.**	**Programme Code**	**UIT**		
Course Code	**20UITC6P**	**Number of Hours/Cycle**	**6**		
Semester	**VI**	**Max. Marks**	**100**		
Part	**III**	**Credit**	**5**		
Core Project I					
Course Title	**Project**		**L**	**T**	**P**
Cognitive Level	**Up to K4**		**-**	**-**	**90**

Course Outcomes

Upon successful completion of this project work the student:

CO1	Will get a little exposure to the field of Information Technology.
CO2	Able to convert a real life problem into a Information Technology projects and solve it by using domains.
CO3	Will gain through practical experience, a sound appreciation and understanding of the theoretical principles learnt in previous semesters
CO4	Will Develop the skills, knowledge and attitude needed to make an effective start as a member of Computer professional

Project work:

- Each faculty will be allotted a group of **(2)** students for their project in any one of the areas of Computer Science in consultation with their guide and the Head of the Department.
- The topic/area of work will be finalized at the Starting of VI semester, allowing scope for the students to gather relevant coding during the Semester.
- The project report should be submitted to the Head of the Department of Computer Application through the Guide one week prior to the commencement of the summative examination.
- They shall submit **three** copies of their project report for valuation.
- The choice of the topic for the project can be from a wide range of subjects, but a text or topic prescribed in the syllabi should be strictly avoided.

Area of work:

C#.Net, ASP.Net, PYTHON, PHP, Java, Java Script, VB, VB.Net, XML, HTML and CSS, Android

Each project should contain the following details:

Brief introduction on the topic
System Analysis
Feasibility Studies
System design
System Requirements
System Implementation
Software Description
Software Testing
Source Code
Screen Shots
Conclusion
Bibliography

- The project should be at least 40 pages excluding bibliography and appendices.
- There shall be **internal and external valuation**.
- The maximum marks for the project work shall be 100.

InternalAssessment:100 Marks

Mode of Evaluation	**Marks**
Project Report	**40**
Viva Voce	**60**

- Further for a pass in this course as a whole, an individual can secure at least 40 marks in project report and viva-voce put together.

Programme	**B.Sc.IT**	**Programme Code**		**UIT**	
Course Code	**20UITS6P**	**Number of Hours/Cycle**		2	
Semester	**VI**	**Max. Marks**		**100**	
Part	**III**	**Credit**		**2**	
Skill Based Practical IV					
Course Title	**Lab 14: Linux Administration**		**L**	**T**	**P**
Cognitive Level		**Up to K3**	**-**	**-**	**30**

Preamble

This course aims at giving adequate exposure to students on the advanced and server level system administration environment.

Program List:

1. Installations of Linux Operating System
2.To Configure boot Loader(GRUB), Network and creating password and user accounts.
3.Linux Shell scripting and VI Editor.
4.File System Permissions.
5.Linux Administration Commands.
6.Users & Group Administration
7. Installation and configuration of SSH Server and enable/disable root login.
8. Installation and Configuration of Telnet server
9. Installation and Configuration of Samba Server.
10. Installation and Configuration of HTTP Server.

Course designed by Mr.N.Thambirajan

Value Added Courses

Programme	B.Sc.(IT)	Programme Code	UIT
Course Code	20CINF31	Number of Hours/Cycle	2
Semester	III	Max. Marks	50
Part	IV	Credit	2
Value Added Course I			
Course Title	Business Analytics		

Preamble

To understand various Excel tools and add-ins for analyzing Business problems.

Unit I	Introduction to Business Analytics	6 Hours
	What is Business Analytics?- Evolution of Business Analytics- Scope of Business Analytics- Data for Business Analytics - Models in Business Analytics-Problem solving with Analytics.	
Unit II	**Analytics on Spreadsheets**	**6 Hours**
	Basic Excel skills - Basic Excel Functions - Using Excel Lookup functions for Database Queries - Spreadsheet Add-Ins for Business Analytics.	
Unit III	**Descriptive Analytics**	**6 Hours**
	Data Visualization - Creating charts in Microsoft Excel - Other Excel visualization tools - Data queries: Tables, Sorting and Filtering – Statistical Methods for Summarizing Data.	
Unit IV	**Descriptive Statistical Measures**	**6 Hours**
	Population and Samples - Measures of Location - Measures of Dispersion - Measures of Association -Measures of Shape - Excel Descriptive Statistical Tool - Statistical thinking in Business Decisions.	
Unit V	**Predictive Analytics**	**6 Hours**
	Trend Lines and Regression Analysis: Modeling Relationships and trends in data- Simple Linear Regression- Forecasting Techniques: Qualitative and Judgmental forecasting-Historical Analogy – The Delphi Method – Statistical Forecasting models – Forecasting models for stationary time series.	

Text Book

1.Marc J.Schniederjans, Dara G. Schniederjans, Christopher M.Starkey(2014*),"Business Analytics Principles. Concepts and Application".*

2.John walkenbach,(2016*),"Microsoft Excel 2016 Bible*",1st Edition, Wiley India (p) Ltd, New Delhi.

Reference Books

1.Kenbluttman,(2018),"*MS EXCEL FORMULAS AND FUNCTIONS",*5TH Edition, for Dummies.

2.Humphrey M.L.(2017),*" Excel for beginners",*2ND Edition, Create Space Independent Publishing platform.

E-Resources

- https://www.youtube.com/watch?v=AodyW7bhku8
- https://www.youtube.com/watch?v=xybB1tISxpk
- https://www.youtube.com/watch?v=8NgVGnX4KOw

Programme	B.Sc.(IT)	Programme Code	UIT
Course Code	20CINF41	Number of Hours/Cycle	2
Semester	IV	Max. Marks	50
Part	IV	Credit	2
Value Added Course II			
Course Title	Desktop Publishing		

Preamble

The objective of this course is to understand the techniques essential to build their career in desktop publishing using Photoshop and Corel draw.

Unit I	**Photoshop Basics**	**6 Hours**
	Getting started with Photoshop – Photoshop program window – working with files – working with Images – Images – Image size – Image resolution – Editing Images – color modes – Setting Fore and Background – Making selection – Editing selection.	
Unit II	**Photoshop Tools**	**6 Hours**
	The painting tools – Drawing tools – Retouching tools – layers – layer palette – working with layers – Hiding, showing & Deleting layers – Repositioning layers – flattening images – Filters.	
Unit III	**Corel Draw Basics**	**6 Hours**
	Getting started with Corel Draw – Corel Draw Screen – Property Bar – Handling files – Views – Drawing and selection – Getting familiar with Tool box – Getting started with project – working with objects and shapes – Adding effects to objects.	
Unit IV	**Text and Image**	**6 Hours**
	.Working with text – text tool – Book cover – Converting Text type- Formatting text – Text editor – Working with Images – Images – Importing Images – Resizing, rotating, Skewing and cropping Images	
Unit V	**Page formatting**	**6 Hours**
	Adding Special effects – Exporting Files – Publishing – Changing Page size, page layout and background – Page frame – Inserting, Deleting and Renaming Pages – Rulers.	

Text Books

1. Ralf Stein Metz & KlaraNahrstedt(2012),*"Multimedia computing, communications & Application",* Pearson Education, Bangalore.
2. Vikas Gupta,(2008),*"Multimedia and Web Design",* Comdex, Dream Tech Press. New Delhi.

Reference Books

- Tay Vaughan (2000),*" Multimedia Making It Work",*Ninth EditionMc Graw Hill Professional, New Delhi.
- Gary David Bouton(2011), "*CorelDRAW: The Official Guide"***,** TataMc Graw Hill Professional, New Delhi.
- Andrew Faulkner&Conrad Chavez (2017**), "***Adobe Photoshop C Classroom in abook"***,**Adobe Press.

Value Added courses

Programme	All	**Programme Code**	UIT
Course Code	20CINF51	**Total Number of Hours**	30 Hrs
Semester		**Max. Marks**	50
Part		**Credit**	2
Value Added Course III			
Course Title	**Internet and its Application**		

Preamble

This course provides a broad overview of the principles and technologies used in Internet Applications.

Unit I	**Introduction to Internet**	**6 Hours**
	Introduction – Some Statistics – What is Internet – How does internet work? – What is Special about the Internet? – A Brief History of Internet – You don't have to be a Mechanic to Drive a Car! **Getting Connected:** Introduction –Dial –up Connections – Dedicated Lines – ISDN-DSL-Cable Modern-Satellite Internet – Cellular broadband – Wireless broadband – Wired and Wireless Broadband Internet Access – Choosing the best Internet Connection – Web Workout.	
Unit II	**World Wide Web (WWW)**	**6 Hours**
	World Wide Web (WWW): Introduction – Internet and Web – How the Web Works? – A Brief History of WWW – Web Workout. **Web Browsers and Web Browsing:** Types of Browsers – Graphical Browser – Bookmarks or Favourites – Browser Plug-Ins Browser Add-ons and Extensions – Text based Browsers – Web Browsing – Web Browsing Tips – Keyboard shortcuts – keep Track of your Time – Use Bookmarks of Favourites – Browse Offline – use a Faster Connection – use a Download manager – Use the Right Mouse Button – Use the Back and Forward Buttons – Cut and Paste URLs – Use the History – Web Workout. **Searching the Web:** Introduction – Information Sources – organizations – Companies – Newspapers and the Media – Electronic Books – Library catalogs and Bookshops – Reference – Finding Information on the Internet – Searching the Web – Web Index – Web Directory – Search Engines – Mete – Search Engines – Making your Search – Improve your Searching – Tips for Internet Research – Invisible Web – Web Workout.	
Unit III	**Internet**	**6 Hours**
	Introduction – IP Address - Domain Names – Domain Name System (DNS) – Uniform Resource Locator (URL) – Electronic Mail Addresses..**Internet Protocols:** Introduction – Transmission Control Protocol / Internet Protocol (TCP / IP) – File Transfer Protocol (FTP) – Hypertext Transfer Protocol (HTTP) – Telnet – Gopher – WAIS – Web Workout.	
Unit IV	**E-Mail**	**6 Hours**

	Introduction – How E-mail works? – Why use E-mail – E-mail –Names and Addresses – Mailing Basics – Address Book – File Attachments – Signature - Setting Priority – Replying and Forwarding E-Mail Messages – Customizing your E-Mail Program – How private is the E-Mail – E-mail Ethics – Spamming – E-Mail—Advantages and Disadvantages – Tips for effective E-mail – use E-Mail Safety Tips – Smileys(Emotions) – Free E-Mail Providers – Web Workout. **Websites and Web Pages:** Introduction – Web Design – Creating a Website – Web Hosting – Website Promotion – Web Workout.	
Unit V	**Electronic Publishing**	**6 Hours**
	Introduction – Electronic Publishing - E-Book Readers – Economics of E-Publishing – Applications of E-Publishing – E-Publishing Advantages and Disadvantages – Web Workout. **Social Networking:**Introduction – Social Networking Timeline – Why Social Networking? – Dangers of Social Networking – Getting Connected – Finally – Web Workout.**Newsgroups, Mailing Lists and Discussion Forums:**Newsgroups – Newsgroup Organization – Working of Newsgroups – The Usenet Network – Accessing a Newsgroup – How to behave? – Mailing Lists – Classification of Mailing Lists – Announcement vs. Discussion Lists – Public vs. Private Lists – Moderated vs. Un-Moderated Lists – Operation of Mailing List – Subscribing to a Mailing List – Mailing List Archives – Mailing List Software – Discussion Forums – Discussion Forum Software – Discussion on the Internet – Web Workout.**Chat, Instant messaging (IM), Internet Telephony (VoIP) and Videoconferencing:**Internet Chat – Internet Relay Chat (IRC) – Working of IRC – IRC Clients – Chatting on Web. Instant Messaging – How IM Works? – IM from the Web – Internet Telephony – Advantage of Internet Telephony – Internet Telephony Service Providers – Videoconferencing – Web Workout.	

Text Book

1.Alexis Leon, Mathews Leon(2012),"*INTERNET for EVERY ONE*", Leon Press Chennai.

Reference Books

1. Raj Kamal (2011),"*Internet & Web Technologies*" TMH Pvt. Ltd.,.

Programme	All	**Programme Code**	UIt
Course Code	20CINF61	**Total Number of Hours**	30 Hrs
Semester		**Max. Marks**	50
Part		**Credit**	2
Value Added Course IV			
Course Title	**Cyber Security**		

Preamble

This course aims at providing students with concept of cyber security, secure protocols, cryptography detection and other security techniques.

Unit I	**Information Security Policies, Standards**	**6 Hours**
	Security Policies – Policy Review Process – Information Security Standards – cyber Laws in India.	
Unit II	**Cyber Laws**	**6 Hours**
	Intellectual Property Law – Semiconductor law – Software Licenses.	
Unit III	**Security of Emerging Technology**	**6 Hours**
	Security of Big Data Analytics – Security of Cloud Computing – security of Internet of Things (IoT).	
Unit IV	**Security of Smart Grid and Scada Controls**	**6 Hours**
	Security of Smart Grid – Security of Scada Control Systems – Security of Wireless Sensor Networks(WSNs).	
Unit V	**Cyber Security Application Security**	**6 Hours**
	Application Security - Security Technology – Denial-of-Service (DOS) Attack –Security Threats – Security Threats to E-Commerce – Digital Signature - Cryptography.	

Text Book

1.C.P.Gupta, K.K,Goyal(2020), "*CyberSecurity: A Self-Teaching Introduction*", David Pallai.

Reference Books

1. W.A. Conklin, G.White,(2016),"*Principles of Computer Security*",McGraw Hill, 4th Edition

2. William Stalings,(2013), "*Cryptography and Network Security Principles and Practices,* Tata McGraw-Hill",7th Edition.

3.Dejey, S.Murugan(2018),"*Cyber Forensics*",Oxford University Press.

<u>As our students find the existing examination pattern very difficult we would like to replace it with the following, for approval.</u>

Examination Pattern for Core and Allied Courses to be implemented from the Academic Year 2021-2022

Two Continuous Internal Assessment (CIA) and One End Semester Examination (ESE) is conducted .The marks are distributed as follows:

Nature of Study	CIA	ESE	Total
Theory	40	60	100
Practical	40	60	100

Continuous Internal Assessment (CIA) - UG

The pattern of question paper for Continuous Internal Assessment (CIA) for UG for III and IV semesters is as follows. The duration for the Internal test is 1½ hours. Equal importance is given to all the units.

Blue Print of the Question Paper (CIA) Maximum Marks: 30

Sections	Types of questions	No. of questions	No. of questions to be answered	Marks for each question	Total Marks
A	Multiple Choice Questions	6	6	1	6
B	Paragraph Questions (Inbuilt choice)	3	3	4	12
C	Essay Questions (Open choice)	3	2	6	12
Total					30

Continuous Internal Assessment components are:

1. Two internal assessment is conducted for 30 marks each
   (The average of the marks of two internal assessments will be taken ((**30 + 30 / 2)** = 30)
2. Two Assignment to be submitted for 5 marks each
   (The average of two assignments is taken for 5 marks)
3. Seminar / Quiz / Group Discussion – 5 marks
   (If Quiz is conducted, the average of two quizzes is taken for 5 marks)
4. Third test may be allowed for absentees of anyone of the two assessments for genuine reasons.

Continuous Internal Assessment (CIA) - PG

The pattern of question paper for Continuous Internal Assessment (CIA) for PG for III and IV is as follows. The duration for the assessment is 2 hours. Equal importance is given to all the units.

Blue Print of the Question Paper (CIA) Maximum Marks: 45

Sections	Types of questions	No. of questions	No. of questions to be answered	Marks for each question	Total Marks
A	Multiple Choice Questions	6	6	1	6
B	Paragraph Questions (Inbuilt choice)	5	5	3	15
C	Essay Questions (Open choice)	5	3	8	24
Total					45

Continuous Internal Assessment components are:

1. Two internal assessment is conducted for 45 marks each
   (The marks of two internal assessments will be converted into 30 marks (**(45+45)/3)** = 30)
2. Two Quizzes is to be conducted for 5 marks each
   (The average of two quizzes is taken for 5 marks)
3. Seminar / Group Discussion – 5 marks
4. Third test may be allowed for absentees of anyone of the two assessments for genuine reasons.

End Semester Examinations (ESE)

Duration of the End Semester Examination is 3 Hours. Equal importance is given to all the units. The pattern of Question Paper for the End Semester Examination is as follows:

Blue Print of the Question Paper (UG & PG) Maximum Marks:60

Sections	Types of questions	No. of questions	No. of questions to be answered	Marks for each question	Total Marks
A	Multiple Choice Questions	10	10	1	10
B	Paragraph Questions (Inbuilt choice)	5	5	4	20
C	Essay type Questions (Open choice)	5	3	10	30
	Total				60

Evaluation Pattern

Under Graduate

1. Passing minimum is 35% in external examination, out of 60i.e. 21 out of 60 will be taken as pass mark for UG students.
2. An aggregate of 40 marks for UG (sum of Continuous Internal Assessment and End Semester Examination).

Post Graduate

1. A Passing minimum of 45% in external examination out of 60 i.e. 27 out of 60 will be taken as pass mark for PG students.
2. An aggregate of 50 marks for PG (sum of Continuous Internal Assessment and End Semester Examination).

Examination Pattern for Part IV Courses

As regards Part IV courses such as Skill Based, Non Major Elective. Value Education, and Environmental Studies Two Continuous Internal Assessment (CIA) and One End Semester Examination (ESE) is conducted .The marks are distributed as follows:

Nature of Study	CIA	ESE	Total
Theory	20	30	50
Practical	20	30	50

Continuous Internal Assessment (CIA) - UG

The pattern of question paper for Continuous Internal Assessment (CIA) for UG is as follows. The duration for the internal test is 1 hour. Equal importance is given to all the units.

Blue Print of the Question Paper (CIA) Maximum Marks: 15

Sections	Types of questions	No. of questions	No. of questions to be answered	Marks for each question	Total Marks
A	Paragraph Questions	5	5	2	10
B	Essay type Questions (open choice)	2	1	5	5
Total					15

Continuous Internal Assessment components are:

1. Two internal tests are conducted for 15 marks each
   (The average of the marks of two internal assessments will be taken
   ((**15+15) / 2)** = 15)
2. One Assignment is to be submitted for 5 marks

End Semester Examinations (ESE)

Duration of the End Semester Examination is 3 Hours. Equal importance is given to all the units. The pattern of Question Paper for the End Semester Examination is as follows:

Blue Print of the Question Paper (UG) Maximum Marks: 30

Sections	Types of questions	No. of questions	No. of questions to be answered	Marks for each question	Total Marks
A	Paragraph Questions	5	5	3	15
B	Essay type Questions (open choice)	5	3	5	15
Total					30

Evaluation Pattern

Under Graduate

1. Passing minimum is 35% in external examination, out of 30i.e. 11 out of 30 will be taken as pass mark for UG students.
2. An aggregate of 40 marks for UG (sum of Continuous Internal Assessment and End Semester Examination).

Examination Pattern for Value Added Courses

As regards Extra Credit Value Added Courses, the study martial will be prepared by the course teacher. One Internal Assessment will be conducted for 25 marks and the End Semester Examination will be conducted for 50 marks and the evaluation will be made by the course teacher. The marks are distributed as follows:

Nature of Study	IA	ESE	Total
Theory	20	30	50
Practical	20	30	50

Continuous Internal Assessment (IA)

The pattern of question paper for Continuous Internal Assessment (CIA) for UG is as follows. The duration for the internal test is 1 hour. Equal importance is given to all the units.

Nature of Study	CIA	ESE	Total
Theory	20	30	50
Practical	20	30	50

Continuous Internal Assessment (IA)

The pattern of question paper for Internal Assessment (IA) is as follows. The duration for the internal test is 1 hour. Equal importance is given to all the units.

Blue Print of the Question Paper (CIA) Maximum Marks: 15

Sections	Types of questions	No. of questions	No. of questions to be answered	Marks for each question	Total Marks
A	Paragraph Questions	5	5	2	10
B	Essay type Questions (open choice)	2	1	10	10
Total					20

End Semester Examinations (ESE)

Duration of the End Semester Examination is 3 Hours. Equal importance is given to all the units. The pattern of Question Paper for the End Semester Examination is as follows:

Blue Print of the Question Paper Maximum Marks: 30

Sections	Types of questions	No. of questions	No. of questions to be answered	Marks for each question	Total Marks
A	Paragraph Questions	5	5	3	15
B	Essay type Questions (open choice)	5	3	5	15
Total					30

Evaluation Pattern

Under Graduate

1. Passing minimum is 35% in external examination, out of 30i.e. 11 out of 30 will be taken as pass mark for UG students.
2. An aggregate of 40 marks for UG (sum of Continuous Internal Assessment and End Semester Examination).