

AUXILIUM COLLEGE (Autonomous)
(Accredited by NAAC with A+ Grade with a CGPA of 3.55 out of 4 in the 3rd Cycle)
Gandhi Nagar, Vellore-632 006

Department of Computer Applications (B.C.A.) - (UG)

OUTCOME BASED EDUCATION - 2020

(Effective for the Batch of Students Admitted from 2020-2021)

SEMESTER I

UCCAB20- FUNDAMENTALS OF INFORMATION TECHNOLOGY

Year/ Sem	Course Code	Title of the Course	Course Type	Course Category	H/W	Credits	Marks
I / I	UCCAB20	Fundamentals of Information Technology	Theory	Core	4	5	40+60

COURSE OBJECTIVES

1. The main objective is to introduce Information Technology in a Simple Language to all undergraduate students regardless of their specialization.
2. To have the knowledge about communication networks and various types of network.
3. It will help them to pursue specialized programs leading to technical and professional careers and certifications in the IT industry.
4. To understand operating system and Evolution and development of operating system.
5. To know the difference between windows and DOS.

COURSE LEARNING OUTCOMES

The Learners will be able to

1. Understand the fundamental concepts of computers with the present level of knowledge of the students.
2. Identify the basic terminology used in computer programming.
3. Understand the basic taxonomy and terminology of the data communication networking.
4. Acquire the knowledge of Internet and its applications
5. Analyze the difference between an operating system and an application program.

CO/PO	PO					
	1	2	3	4	5	6
CO1	M	L	M	L	L	H
CO2	L	M	L	H	L	H
CO3	H	L	L	M	M	M
CO4	M	L	M	M	L	M
CO5	M	M	L	M	M	H

Low - L, Medium - M, High - H

COURSE SYLLABUS

Unit I

Hours: 12

- 1.1 Definition and Technological Trends in IT (K1,K2,K3)
- 1.2 Applications of Information Technology (K1,K2)
- 1.3 Introduction to Computers: Definition - Characteristics of a Computer (K1,K2)
- 1.4 Classification of Computers (K1,K2)
- 1.5 Basic Anatomy of the Computer (K1,K2)
- 1.6 Applications / Uses of Computers in Different Fields (K1,K2)

Unit II

Hours: 12

- 1.1 Input Devices (K1,K2)
- 1.2 Output Devices (K1,K2)
- 1.3 Data Representation (K1,K2)
- 1.4 Programming Languages / Computer Languages (K1,K2)
- 1.5 System Software and Application Software (K1,K2)
- 1.6 Difference between System Software and Application Software (K1, K2, K3)

Unit III

Hours: 12

- 3.1 Computer Networks : Overview of Networks (K1)
- 3.2 Intranet and Extranet (K2)
- 3.3 Communication Processor (K2)
- 3.4 Communication Media (K2)
- 3.5 Types of Networks: LAN, MAN, WAN (K2)
- 3.6 Network Topologies (K2)

Unit IV

Hours: 12

- 4.1 Internet and its Applications : History of Internet - Uses of Internet - Advantages of Internet (K1)
- 4.2 Internet Access: Types of Internet Connections (K2)
- 4.3 Internet Protocols and Services (K2)
- 4.4 Internet Addressing: IP Address – URL – DNS (K2)
- 4.5 Web Browser and Search Engine (K3)
- 4.6 E-mail (K3)

Unit V

Hours: 12

- 5.1 Operating System: Evolution of Operating Systems (K1)
- 5.2 Function of Operating System (K2)
- 5.3 Classification of Operating System (K2)
- 5.4 Example of Operating System – DOS –Windows – UNIX - Linux (K2)
- 5.5 Difference between Windows and DOS (K2)
- 5.6 Difference between Linux and Windows (K2)

Book for Study:

1. Pelin Aksoy, Laura DeNardis, “Introduction to Information Technology”, 1st Edition, Cengage Learning India Private Limited, 2009.
2. Alexis Leon and Mathews Leon, “Fundamentals of Information Technology”, Second Edition, Vikas Publishing House Pvt. Ltd., 2009.

Books for Reference:

1. Dr. P.Rizwan Ahmed, “Introduction to Information Technology”, Second Edition, Margham Publications, Chennai, 2016
2. Alexis Leon and Mathew Leon, “Internet for Everyone”, Second Edition, Vikas Publishing, 201

OER:

1. <http://bookboon.com/en/it-programming-ebooks>
2. http://www.engineering108.com/pages/IT-Programming/IT_Programming_ebooks_free_download.html

SEMESTER V/VI**USCSG520 –SKILL BASED ELECTIVE: R PROGRAMMING**

Year /Sem	Course Code	Title of the Course	Course Type	Course Category	H/W	Credits	Marks
III / VI	USCSG520	Skill Based Elective: R Programming	Theory with Practical	Skill Based Elective	2	2	40+60

COURSE OBJECTIVES

1. Understand the usage of R programming interactive environment.
2. Understand R programming language includes functions, arrays and dataframes.
3. Describe the statistical computing includes programming in R, reading and accessing data in R.
4. Understand the concept of Meta Programming.
5. Build a simple sorting algorithm.

COURSE SYLLABUS**Unit I****Hours: 6**

- 1.1 Introduction to R and R Studio. (K1, K2)
- 1.2 Basic Objects: Vector. (K2)
- 1.3 Matrix, Array. (K2, K3)
- 1.4 Lists. (K2)
- 1.5 Data Frames. (K3)
- 1.6 Functions. (K2, K3)

Unit II**Hours: 6**

- 1.1 Basic Expressions: Assignment Expressions. (K1, K2)
- 1.2 Conditional Expressions. (K3, K4)
- 1.3 Loop Expressions. (K3, K4)
- 1.4 Basic Objects: Object Functions (K2, K3)
- 1.5 Logical Functions. (K2, K3)
- 1.6 Math functions (K2, K3)

Unit III**Hours: 6**

- 1.1 Numeric Methods Statistical function. (K2, K3)
- 1.2 Family Functions. (K2, K3)
- 1.3 Working with Strings. (K2, K3)
- 1.4 Working with Data. (K2, K3)
- 1.5 Meta programming. (K2)
- 1.6 Object Oriented Programming. (K2, K3, K4)

Unit IV**Hours: 6**

1. Write a program that prints 'Hello World' to the screen.
2. Write a program that asks the user for a number n and prints the sum of the numbers 1 to n.
3. Write a program that prints a multiplication table for numbers up to 12.
4. Write a function that returns the largest element in a list.

Unit V**Hours: 6**

1. Write a function that computes the running total of a list.
2. Write a function that tests whether a string is a palindrome.
3. Implement the following sorting algorithms: Selection sort, Insertion sort, Bubble Sort.
4. Implement linear search.
5. Implement binary search.
6. Implement Matrices Addition, Subtraction and Multiplication

Books for Study:

1. Kun Ren, "Learning R. Programming, Packt Publishing" - ebooks Account, October 28, 2016.
2. Dr. Mark Gardener, "Beginning R: The Statistical Programming Language", Paperback, 2013.

Books for Reference:

1. Colin Gillespie, Robin Lovelace, "Efficient R Programming: A Practical Guide to Smarter Programming", O'Reilly Media, 1st Edition (October 25, 2016); eBook (2017-04-10).
2. Daniel Navarro, "Learning Statistics with R", lulu.com (2015); eBook (University of Adelaide, 2018. Updated Continuously)

OER:

1. https://www.jmc.edu/econtent/ug/3202_R%20PROGRAM.pdf
2. http://www.tutorialspoint.com/r/r_tutorial.pdf
3. https://cran.r-project.org/doc/contrib/Paradis-rdebuts_en.pdf

SEMESTER V/VI

USCSF620 - SKILL BASED ELECTIVE: DATA ANALYTICS USING DATA VISUALIZATION TOOLS

Year /Sem	Course Code	Title of the Course	Course Type	Course Category	H/W	Credits	Marks
III / VI	USCSF620	Skill Based Elective: Data Analytics using Data Visualization	Theory with Practical	Skill Based Elective	2	2	40+60

COURSE OBJECTIVES

1. To understand and extend the current state of the art in data visualization.
- 4 To Understand the different data format and its graphical representation
2. To Identify the various data visualizations tools in the market and its features.
3. To provide skills present data effectively through chart, map and dashboard.
4. To Develop skills to present data effectively through chart, map and dashboard.

COURSE SYLLABUS

UNIT I

Hours: 5

- 1.1 Data Visualization: Introduction. (K1)
- 1.2 Benefits of Data Visualization. (K2)
- 1.3 Data Visualization Tools. (K2)
- 1.4 Features. (K2)
- 1.5 Data access from data sources. (K2)

UNIT II

Hours: 5

- 2.1 Data Transformation. (K1, K2)
- 2.2 Types of charts. (K2)
- 2.3 Bar Chart. (K1, K2)
- 2.4 Pie Chart. (K2)
- 2.5 Data Tables. (K2)
- 2.6 Scatter Chart. (K2)

UNIT III

Hours: 5

- 3.1 Time series Chart. (K2)
- 3.2 Score card. (K2)
- 3.3 Scatter Chart. (K2)
- 3.4 Bullet Chart. (K2)
- 3.5 Area Chart. (K2)
- 3.6 Heat Map. (K2)

UNIT IV

Hours: 8

1. Create a bar chart for the given data.
2. Create a pie chart for the given data.
3. Create a scatter chart for the given data.
4. Create a time series chart for the given data.

UNIT V

Hours: 7

5. Create a bullet chart for the given data.
6. Create area chart for the given data.
7. Create a heat map for the given data.

Book for Study:

1. Nathan Yau Visualize This: The FlowingData Guide to Design, Visualization, and Statistics Wiley, 1st Edition 2011.

Books for Reference:

1. Cole Nussbaumer Knaflic Storytelling with Data: A Data Visualization Guide for Business Professionals John Wiley & Sons 2015.

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1. https://www.tutorialspoint.com/tableau/tableau_tutorial.pdf
2. <https://www.pdfdrive.com/tableau-books.html>
3. <http://projanco.com/Library/Learning%20Tableau%202019%20Tools%20for%20Business%20Intelligence,%20data%20prep,%20and%20visual%20analytics.pdf>