Central University of Karnataka

ಕರ್ನಾಟಕ ಕೇಂದ್ರೀಯ ವಿಶ್ವವಿದ್ಯಾಲಯ

कर्नाटक केंद्रीय विश्वविद्यालय

B.Sc.-(CS)
Bachelor of Science (Computer Science)

Course Structure and CBCS Syllabus
(With effect from 2023-24)

Department of Computer Science
School of Computer Science

Kadaganchi, Kalaburagi – 585 367, Karnataka State, INDIA

CENTRAL UNIVERSITY OF KARNATAKA *(Established by an Act of the Parliament in 2009)* Kadaganchi, Kalaburagi – 585367, INDIA		**Department of Computer Science** **School of Computer Science** Kadaganchi, Aland Road, Kalaburagi District– 585367

Bachelor of Science (Computer Science)

ABOUT PROGRAM

This is a Bachelor of Science program in Computer Science as major course and one minor course, which will be opted by a student of his/her choice prepared as per the guidelines of CUK. The students study minor courses upto second year and in third year there will be courses related to the Computer Science only. There will be an exit option after completion of each year.

ELIGIBILITY FOR ADMISSION

Students who have passed PU/10 + 2 examination with 50% marks (45% for OBC {NON CREAMY LAYER}, SC, ST, PWD and Kashmiri Migrant and non migrant pandits) and having studied Physics, Chemistry and Mathematics.

DURATION OF COURSE

4 years (1 year Award of certificate + 2 year Award of diploma + 3 year Award Of Bachelor Degree in Computer Science + 4 year Bachelor Of Science In Research With Computer Science as MAJOR)

MEDIUM OF INSTRUCTION

The medium of instruction shall be English.

PASSING AND CLASSIFICATION

The minimum marks for passing and classification for the award of the Bachelor of Science (Computer Science) degree shall be as per the existing norms of other UG degree courses of Central University of Karnataka, Kalaburagi.

OTHER PROVISIONS

All the other provisions relating to attendance, reappearance in examinations, repeal and saving clauses, removal of difficulties, etc., shall be as per the existing norms of other UG degree courses of Central University of Karnataka, Kalaburagi.

Vision Statement:

To groom the students technically competent and skilled intellectual professionals to address the challenges in the current computing arena arising in Software Industry, Academia and Research & Development laboratories.

Mission Statements:

MS-1. Excellence in Teaching and Research.

MS-2. Build highly skilled IT professionals.

MS-3. Interaction with Industries and Research organizations.

Structure of the Syllabus – B.Sc. (CS)

Semester I													
SL No	**In Sl No**	**Sub Code**	**T/P***	**Course Type**	**Course Type**	**Title**	**Credits**	**Duration (Hrs)**	**L+T+P**	**Duration of Exam (Min.)**	**IA (40%)**	**End sem. Exam (60 %)**	**Total Marks**
01	01	UCSCC11100	T	Discipline Specific Core	DSC	Basics of Computers and Programming using C	6	4+4	4+0+2	180	60	90	150
02	02		T	Multidisciplinary courses	MDC	Opt Course from other Department	3	3	3+0+0	120	30	45	75
03	03	UCSCS11100	T	Skill enhancement course	SEC	Fundamentals of Web Designing	3	2+2	2+0+1	120	30	45	75
04	04		T	Minor	MC	Opt Course from other Department	6	4+4	4+0+2	180	60	90	150
05	05		T	Ability Enhancement Compulsory Courses	AEC	Language	2	2	2+0+0	90	20	30	50
06	06		T	Value Addition Courses	VAC	Select from the list	2	2	1+0+1	90	20	30	50
							22	**27**					**550**
For other Department Students													
01	01	UCSTD11100	T	Multidisciplinary courses	MDC	Computer Fundamentals	3	3	3+0+0	120	30	45	75
02	02	UCSCM11100	T	Minors	MC	Basics of computers and Programming using C	6	4+4	4+0+2	180	60	90	150

Semester II													
SL No	**In Sl No**	**Sub Code**	**T/P***	**Course Type**	**Course Type**	**Title**	**Credits**	**Duration (Hrs)**	**L+T+P**	**Duration of Exam (Min.)**	**IA (40%)**	**End sem. Exam (60 %)**	**Total Marks**
07	01	UCSCC21101	T	Discipline Specific Core	DSC	Data structures	6	4+4	4+0+2	180	60	90	150
08	02		T	Multidisciplinary courses	MDC	Opt Course from other Department	3	3	3+0+0	120	30	45	75
09	03	UCSCS21101	T	Skill Enhancement courses	SEC	Advanced Web designing	3	3	3+0+0	120	30	45	75
10	04		T	Minor	MC	Opt Course from other Department	6	4+4	4+0+2	180	60	90	150
11	05		T	Ability Enhancement Compulsory Courses	AEC	Language	2	2	2+0+0	90	20	30	50
12	06			Value Addtion Course	VAC	Select from list	**2**	**2**	**1+0+1**	**90**	**20**	**30**	**50**
							22	**27**					**550**
For other Department Students													
01	03	UCSTD21101	T	MDC	MDC	Office Automation	3	3	3+0+0	120	30	45	75
02	04	UCSCM21101	T	Minor	DSC	Data structures	6	4+4	4+0+2	180	60	90	150

Semester III													
SL No	**In Sl No**	**Sub Code**	**T/P***	**Course Type**	**Course type**	**Title**	**Credits**	**Duration (Hrs)**	**L+T+P**	**Duration of Exam (Min.)**	**IA (40%)**	**End sem. Exam (60 %)**	**Total Marks**
13	01	UCSCC30200	T	Discipline Specific Core	DSC	OOP's using JAVA	6	4+4	4+0+2	180	60	90	150
14	02		T	Other department	MDC	Opt Course from other Department	3	3	3+0+0	120	30	45	75
15	03	UCSCS30200	T	Skill Enhancement courses	SEC	Android Application Development	3	3	3+0+0	120	30	45	75
16	04		T	Minors	MC	Opt Course from other Department	4	4	4+0+0	150	40	60	100
17	05		T	Ability Enhancement Compulsory Courses	AEC	Language	2	2	2+0+0	90	20	30	50
18	06		T	Value Addition Courses	VAC	Select from list	2	1+2	1+0+1	90	20	30	50
							20	**29**					**500**
For other Department Students													
01	05	UCSTD30200		MDC	MDC	Fundamentals of Computer Network and Internet	3	3	3+0+0	120	30	45	75
02	06	UCSCM30200		Minors	MC	Core Java	4	3+1	3+0+1	120	40	60	100

Semester IV													
SL No	**In Sl No**	**Sub Code**	**T/P***	**Course Type**	**Course Type**	**Title**	**Credits**	**Duration (Hrs)**	**L+T+P**	**Duration of Exam (Min.)**	**IA (40%)**	**End sem. Exam (60 %)**	**Total Marks**
19	01	UCSCC40201	T	Discipline Specific Core	DSC	Computer Organization and Architecture	6	4+4	4+0+2	180	60	90	150
20	02	UCSCC40202	T	Discipline Specific Core	DSC	Python Programming	6	4+4	4+0+2	180	60	90	150
21	03		T	Minors	MC	Opt Course from other Department	4	4	4+0+0	150	40	60	100
22	04			Ability Enhancement Compulsory Courses	AEC	Language	2	2	2+0+0	90	20	30	50
23	05		T	Value Addition Courses	VAC	Select from the list	2	2	1+0+1	90	20	30	50
							20	**29**					**500**
For other Department Students													
01	07	UCSCM40201	T	Minor	MC	Python Programming	4	4	3+0+1	90	40	60	100

VAC:1. Yoga and Health**; VAC:2.**Ethics and Human Values**; VAC:3.** Personal Development**; VAC:4.**Introduction to Indian Knowledge System; **VAC:5.**Soft Skills**; VAC:6.**Professional Development**; VAC:7.** Employability Skills; **VAC:8.**Entrepreneurship Development**; VAC:9.**Community Engagement**;**

School of Computer Sciences
Department of Computer Science

Name of the Academic Program: Bachelor of Science (Computer Science)

Course Code:UCSCC11100
Title of the Course: Basics of Computers and Programming using C
L-T-P: 4-0-2 Credits: 6

Prerequisite Course / Knowledge (If any):

- The students should hold fundamental knowledge of Computers.
- The students should hold the skill set of basic Mathematics.

Course Outcomes (COs)

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

CO-1: Describe about the variables and constants. (Level 2: Understand)
CO-2: Apply the concept of pointers and structures for execution of programs (Level 3: Apply)
CO-3: Understand the basics of computers. (Level 2: Apply)
CO-4: Discuss on file handling in C (Level 2: Understand)
CO-5: Describe the programming constructs in C. (Level 2: Understand)

Mapping of Course Outcomes (COs) with Program Learning Outcomes (PLOs)

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CO1	3	2	2	3	2	2	1	1	2	2
CO2	2	2	2	3	2	2	2	2	3	3
CO3	2	2	2	2	2	2	1	3	3	3
CO4	1	1	1	3	1	1	1	2	2	2
CO5	3	2	2	2	2	2	1	3	3	3

Write ‘3’ in the box for ‘High-level’ mapping, 2 for ‘Medium-level’ mapping, 1 for ‘Low-level’ mapping.

UCSCC11100: Basics of Computers and Programming using C

Credits: 6 **IA: 60 Marks**
Contact Hrs (L:T:P): 6 (4:0:2) **End Exam: 90 Marks**

Unit 1 **(15 hrs)**

Introduction to computers, input and output devices, designing efficient programs. Introduction to C, Structure of C program, Compilers, Compiling and executing C programs, variables, constants, Input/output statements in C. Operators in C, Type conversion and type casting.

Unit 2 **(15 hrs)**

Decision control and Looping statements: Introduction to decision control, Conditional branching statements, iterative statements, nested loops, break and continue statements, goto statement. Functions: Introduction using functions, Function definition, function declaration, function call, return statement, passing parameters to functions, scope of variables, storage classes, recursive functions.

Unit 3 **(15 hrs)**

Arrays: Declaration of arrays, accessing the elements of an array, storing values in arrays, Operations on arrays, Passing arrays to functions, Two dimensional arrays, operations on two-dimensional arrays, two-dimensional arrays to functions, multidimensional arrays. Applications of arrays and introduction to strings: Applications of arrays, case study with sorting techniques. Introduction to strings: Reading strings, writing strings, summary of functions used to read and write characters.

Unit 4 **(15 hrs)**

Strings: String taxonomy, operations on strings, Miscellaneous string and character functions, arrays of strings. Pointers: Understanding the Computer's Memory, Introduction to Pointers, Declaring Pointer Variables Structures: Introduction to structures, File management in C.

Reference Books:

1. E. Balaguruswamy, Programming in ANSI C, 7th Edition, Tata McGraw-Hill.
2. Brian W. Kernighan and Dennis M. Ritchie, The ‘C’ Programming Language, Prentice Hall of India
3. YeshwantKanetkar, Let us C, BPB publications
4. Computer fundamentals and programming in C “ReemaThareja”, Oxford University, Second edition, 2017

School of Computer Sciences
Department of Computer Science

Name of the Academic Program: Bachelor of Science (Computer Science)

Course Code: UCSCS11100
Title of the Course: Fundamentals of Web Designing
L-T-P: 2-0-1 Credits: 3
Prerequisite Course / Knowledge (If any):

- The students should have basic knowledge of computers.
- The students should be well versed in operating the web sites.

Course Outcomes (COs)

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

CO-1: Explain features for the Internet and World Wide Web. (Level 2: Understand)
CO-2: Demonstrating HTML concepts on portal design. (Level 3: Apply)
CO-3: Demonstration of client and server interface(Level 3: Apply)
CO-4: Practice the HTML and CSS features on real time requirements. (Level 3: Apply)
CO-5: Apply the logic for the creation of forms and frames (Level 3: Apply)

Mapping of Course Outcomes (COs) with Program Learning Outcomes (PLOs)

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CO1	3	3	3	3	2	2	1	1	2	2
CO2	2	3	2	3	2	2	2	2	3	3
CO3	3	3	3	2	2	2	1	3	3	3
CO4	2	2	2	3	1	1	1	2	2	2
CO5	3	3	3	2	2	2	1	3	3	3

Write ‘3’ in the box for ‘High-level’ mapping, 2 for ‘Medium-level’ mapping, 1 for ‘Low-level’ mapping.

UCSCS11100: Fundamentals of Web Designing

Credits: 3 **IA: 30 Marks**

Contact Hrs (L:T:P): 3 (2:0:1) **End Exam: 45 Marks**

Unit 1 **(15 hrs)**

Basics of HTML: Introduction, History of HTML, Structure of HTML Document: Text Basics, HTML Elements, Attributes HTML Headings, Paragraphs, HTML Formatting, Fonts, Styles, Images, Multimedia, Lists, Links, Document Layout, Creating Forms, Frames and Tables.

Unit 2 **(15 hrs)**

Cascading Style Sheets Basics:Cascading Style Sheets Overview, Selectors and Declarations, Syntax for Color Values, Configure Inline CSS, Configure Embedded CSS, Configure External CSS, CSS Selectors: Class, Id,and Descendant, Span Element, Practice with CSS, The Cascade, Practice with the Cascade, CSS Syntax Validation.

Unit 3 **(15 hrs)**

Graphics & Text Styling Basics: Web Graphics, Image Element, CSS Interactivity with Pseudo-Classes, Practice with CSS Two-Column Layout, CSS for Print, CSS Sprites, Positioning with CSS, Practice with Positioning, Fixed Position Navigation Bar.

Reference Books:

1. Satish Jain, Shashank Jain (2010), Internet Technology and Web Design, BPB Publication.
2. Thomas Powell (2017), The Complete Reference: HTML & CSS, 5th Edition, McGraw Hill.
3. Lemay Laura (2016), Mastering HTML, CSS & Java Script, BPB Publications.
4. Deborah J. Miller (2001), Careers with Internet Service Providers, Rosen Publishing Group.

School of Computer Sciences
Department of Computer Science

Name of the Academic Program: Bachelor of Science (Computer Science)

Course Code: UCSTD11100
Title of the Course: Computer Fundamentals
L-T-P: 3-0-0 Credits: 3
Prerequisite Course / Knowledge (If any):

- Students should have basic knowledge of electronics.

Course Outcomes (COs)

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

CO-1: Describe the basics and applications of computers. (Level 2: Understand)
CO-2: Explain the network system and its types. (Level 2: Understand)
CO-3: Discuss on features of windows operating system. (Level 2: Understand)
CO-4: Identify the services of the internet and its applications. (Level 2: Understand)
CO-5: Discuss types of Operating systems. (Level 2: Understand)

Mapping of Course Outcomes (COs) with Program Learning Outcomes (PLOs)

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CO1	3	3	3	3	2	2	1	1	2	2
CO2	3	2	2	3	2	2	2	3	2	2
CO3	2	2	3	2	2	2	3	2	2	2
CO4	3	1	2	3	1	1	2	3	1	1
CO5	3	3	3	2	2	2	1	3	3	3

Write ‘3’ in the box for ‘High-level’ mapping, 2 for ‘Medium-level’ mapping, 1 for ‘Low-level’ mapping.

UCSTD11100: Computer Fundamentals

Credits: 3 **IA: 30 Marks**

Contact Hrs (L:T:P): 3 (3:0:0) **End Exam: 45 Marks**

Unit 1 **(15 hrs)**

Basics of Computer: Definition, Characteristics of Computers, Applications of Computer, Generations of computers, Components of Computer System: Central Processing Unit (CPU), Input/output Devices, Computer Memory: primary and secondary memory, magnetic and optical storage devices, Concepts of Hardware and Software.

Unit 2 **(15 hrs)**

Network and Internet:History and evolution of Computer Network, Types of network (LAN, MAN & WAN), Search engines, Types of Search engines, Internet, architecture of internet, advantages and disadvantages of internet and its applications.

Unit 3 **(15 hrs)**

Operating system and Microsoft Windows: Definition & functions, basics of Windows, components of windows, icons, types of icons, taskbar, activating windows, title bar, running applications, exploring computer, managing files and folders, copying and moving files and folders, Control panel – display properties, adding and removing software and hardware, setting date and time, screensaver and appearance, windows accessories.

Reference Books:

1. P.B.Kottur (2009), *Computer Concepts & C Programming*, Sapna Book House.
2. V. Rajaraman (2008), *Computer Fundamentals*, Prentice Hall of India.
3. P.K. Sinha (1992), *Computer Fundamental*, Prentice Hall of India.

School of Computer Sciences
Department of Computer Science

Name of the Academic Program: Bachelor of Science (Computer Science)

Course Code:UCSCM11100
Title of the Course: Basics of Computers and Programming using C
L-T-P: 4-0-2 Credits: 6

Prerequisite Course / Knowledge (If any):

- The students should hold fundamental knowledge of Computers.
- The students should hold the skill set of basic Mathematics.

Course Outcomes (COs)

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

CO-6: Describe about the variables and constants. (Level 2: Understand)
CO-7: Apply the concept of pointers and structures for execution of programs (Level 3: Apply)
CO-8: Understand the basics of computers. (Level 2: Apply)
CO-9: Discuss on file handling in C (Level 2: Understand)
CO-10: Describe the programming constructs in C. (Level 2: Understand)

Mapping of Course Outcomes (COs) with Program Learning Outcomes (PLOs)

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CO1	3	2	2	3	2	2	1	1	2	2
CO2	2	2	2	3	2	2	2	2	3	3
CO3	2	2	2	2	2	2	1	3	3	3
CO4	1	1	1	3	1	1	1	2	2	2
CO5	3	2	2	2	2	2	1	3	3	3

Write ‘3’ in the box for ‘High-level’ mapping, 2 for ‘Medium-level’ mapping, 1 for ‘Low-level’ mapping.

UCSCM11100: Basics of Computers and Programming using C

Credits: 6 **IA: 60 Marks**
Contact Hrs (L:T:P): 6 (4:0:2) **End Exam: 90 Marks**

Unit 1 **(15 hrs)**

Introduction to computers, input and output devices, designing efficient programs. Introduction to C, Structure of C program, Compilers, Compiling and executing C programs, variables, constants, Input/output statements in C. Operators in C, Type conversion and type casting.

Unit 2 **(15 hrs)**

Decision control and Looping statements: Introduction to decision control, Conditional branching statements, iterative statements, nested loops, break and continue statements, goto statement. Functions: Introduction using functions, Function definition, function declaration, function call, return statement, passing parameters to functions, scope of variables, storage classes, recursive functions.

Unit 3 **(15 hrs)**

Arrays: Declaration of arrays, accessing the elements of an array, storing values in arrays, Operations on arrays, Passing arrays to functions, Two dimensional arrays, operations on two-dimensional arrays, two-dimensional arrays to functions, multidimensional arrays. Applications of arrays and introduction to strings: Applications of arrays, case study with sorting techniques. Introduction to strings: Reading strings, writing strings, summary of functions used to read and write characters.

Unit 4 **(15 hrs)**

Strings: String taxonomy, operations on strings, Miscellaneous string and character functions, arrays of strings. Pointers: Understanding the Computer's Memory, Introduction to Pointers, Declaring Pointer Variables Structures: Introduction to structures, File management in C.

Reference Books:

5. E. Balaguruswamy, Programming in ANSI C, 7th Edition, Tata McGraw-Hill.
6. Brian W. Kernighan and Dennis M. Ritchie, The ‘C’ Programming Language, Prentice Hall of India
7. YeshwantKanetkar, Let us C, BPB publications
8. Computer fundamentals and programming in C “ReemaThareja”, Oxford University, Second edition, 2017

School of Computer Sciences
Department of Computer Science

Name of the Academic Program: Bachelor of Science (Computer Science)

Course Code:UCSCC21101
Title of the Course: Data structures
L-T-P: 4-0-2 Credits: 6

Prerequisite Course / Knowledge (If any):

- The students should hold fundamental knowledge of Computers.
- The students should hold the skill set of knowledge of programming in C .

Course Outcomes (COs)

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

CO-1: Describe representation and functions of arrays. (Level 2: Understand)
CO-2: Analyze an algorithm for searching and sorting techniques in terms of time complexity (Level 4: Analyze)
CO-3: Use stacks, linear lists and queues. (Level 3: Apply)
CO-4: Describe the Linked List (Level 2: Understand)
CO-5: Demonstrate the data structure concepts using 'C' programming. (Level 3: Apply)

Mapping of Course Outcomes (COs) with Program Learning Outcomes (PLOs)

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CO1	3	3	3	3	2	2	1	1	2	2
CO2	3	2	2	3	2	2	2	2	3	3
CO3	3	3	3	2	2	2	1	3	3	3
CO4	3	2	2	3	1	1	1	2	2	2
CO5	3	3	3	2	2	2	1	3	3	3

Write '3' in the box for 'High-level' mapping, 2 for 'Medium-level' mapping, 1 for 'Low-level' mapping.

UCSCC21101: Data structures

Credits: 6 **IA: 60 Marks**
Contact Hrs (L:T:P): 6 (4:0:2) **End Exam: 90 Marks**

Unit 1 **(15 hrs)**

Introduction: Data Structures, Classifications (Primitive & Non-Primitive), Data structure operations (Traversing, inserting, deleting, searching, and sorting).
Review of Arrays. Structures: Array of structures Self-Referential Structures. Dynamic Memory Allocation Functions. Representation of Linear Arrays in Memory, dynamically allocated arrays and Multidimensional Arrays. Demonstration of representation of Polynomials and Sparse Matrices with arrays.

Unit 2 **(15 hrs)**

Stacks: Definition, Stack Operations, Array Representation of Stacks, Stacks using Dynamic Arrays. Different representation of expression. Stack Applications: Infix to postfix conversion, Infix to prefix conversion, evaluation of postfix expression, recursion.

Queues: Definition, Array Representation of Queues, Queue Operations, Circular Queues, Queues and Circular queues, Dequeues, Priority Queues.

Unit 3 **(15 hrs)**

Linked Lists: Definition, classification of linked lists. Representation of different types of linked lists in Memory, Traversing, Insertion, Deletion, Searching, Sorting, and Concatenation Operations on Singly linked list, Doubly Linked lists, Circular linked lists, and header linked lists.

Trees : Terminologies, Binary Trees, Properties of Binary trees, Array and linked Representation of Binary Trees, Binary Tree Traversals - Inorder, postorder, preorder;

Applications of Linked lists – Polynomials, Sparse matrix representation. Programming Example

Unit 4 **(15 hrs)**

Threaded binary trees, Binary Search Trees – Definition, Insertion, Deletion, Traversal, and Searching operation on Binary search tree. Application of Trees-Evaluation of Expression.

Graphs: Definitions, Terminologies, Matrix and Adjacency List Representation of Graphs, Traversal methods: Breadth First Search and Depth First Search.

Hashing: Hash Table organizations, Hashing Functions, Static and Dynamic Hashing.

Reference Books:

1. Ellis Horowitz and SartajSahni, Fundamentals of Data Structures in C, 2nd Ed, Universities Press, 2014.
2. Seymour Lipschutz, Data Structures Schaum's Outlines, Revised 1st Ed, McGraw Hill, 2014.
3. ReemaThareja, Data Structures using C, 3rd Ed, Oxford press, 2012.
4. Gilberg and Forouzan, Data Structures: A Pseudo-code approach with C, 2nd Ed, Cengage Learning,2014.
5. Jean-Paul Tremblay & Paul G. Sorenson, An Introduction to Data Structures with Applications,2nd Ed, McGraw Hill, 2013
6. A M Tenenbaum, Data Structures using C, PHI, 1989

UCSCS21101: Advanced Web Designing (SEC for our students II Sem)

Credits: 3 **IA: 30 Marks**

Contact Hrs (L:T:P): 3 (2:0:1) **End Exam: 45 Marks**

Unit 1 **(15 hrs)**

Form Basics: Form Overview, Text Box, Submit Button and Reset Button, Checkbox and Radio Button, Hidden Field and Password Box, Textarea Element, Select Element and Option Element, Label Element, Fieldset Element and Legend Element , Style a Form with CSS, CSS Grid Layout Form, Server-Side Processing, Practice with a Form, More Text Form Controls, Datalist Element, Slider and Spinner Controls, Calendar and Color-Well Controls.

Unit 2 **(15 hrs)**

Installing Python and Django, Creating virtual Environment, Starting Project, Creating a Database, Django's Models: Defining model in Python, Basic Data Access, Retrieving Records.

Unit 3 **(15 hrs)**

Templates: Creating site Template, Loading static files, listing base html and main css, Accessing the Django Admin site, Managing users in the admin, Django's Forms.

Reference Books:

1. Thomas Powell (2017), The Complete Reference: HTML & CSS, 5th Edition, McGraw Hill.

2. Nigel George , Mastering Django, GNW publication 2020

3. Ben Shaw, Saurabh Badhwar, Andrew Bird, Bharath Chandra K S, Web Development with Django: Learn to build modern web applications with a Python-based framework, 2021

School of Computer Sciences
Department of Computer Science

Name of the Academic Program: Bachelor of Science (Computer Science)

Course Code: UCSTD21101
Title of the Course: Office Automation
L-T-P: 2-0-1 Credits: 3

Prerequisite Course / Knowledge (If any):
- Students should have knowledge of operating computers.

Course Outcomes (COs)

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

CO-1: Demonstrate the examples on MS-Word features. (Level 3: Apply)
CO-2: Describe the features of MS-Excel. (Level 2: Understand)
CO-3: Identify the operations for preparing presentations. (Level 2: Understand)
CO-4: Discuss on table creation in word file(Level 2: Understand)
CO-5: Explain data analysis features of MS-Excel(Level 2 : Understand)

Mapping of Course Outcomes (COs) with Program Learning Outcomes (PLOs)

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CO1	2	1	2	2	2	2	1	1	2	2
CO2	2	2	2	3	2	3	2	2	3	2
CO3	2	1	3	2	2	2	1	2	2	3
CO4	2	2	2	2	1	1	1	2	2	2
CO5	1	3	1	2	2	2	1	3	3	3

Write ‘3’ in the box for ‘High-level’ mapping, 2 for ‘Medium-level’ mapping, 1 for ‘Low-level’ mapping.

UCSTD21101: Office Automation

Credits: 3 **IA: 30 Marks**

Contact Hrs (L:T:P): 3 (3:0:0) **End Exam: 45 Marks**

Unit 1 **(15 Hrs)**

Introduction to Internet:Definition, Internet Service Providers, Modems, Routers, Internet Addresses, Protocols of Internet, World Wide Web,Search Engines.

Word Processing application: Working with Documents -Opening & Saving files, Editing text documents, Formatting page & setting Margins, Importing & Exporting documents, Using Toolbars, Ruler, Using Icons, Formatting Documents, Setting Page style, Creating Tables, Drawing, Tools, Printing Documents – Shortcut keys.

Unit 2 **(15 Hrs)**

Spreadsheet application: Spread Sheet & its Applications, Formula Editing, Formatting, Toolbars Spreadsheet types. Spreadsheet addressing, Inserting Data Data from external files, Inserting Functions, Formatting Spreadsheets, Formatting layout for Graphics, Working with sheets: Sorting, Filtering, Validation, Consolidation, and Subtotal. Creating Charts: Drawing. Printing. Using Tools – Error checking, Formula Auditing, Creating & Using Templates.

Unit 3 **(15 Hrs)**

Presentation application: Presentation, Different presentation templates, setting backgrounds, selecting presentation layouts. Creating a presentation: Setting Presentation style, Adding text to the Presentation. Formatting a Presentation, Adding Effects to the Presentation.

Reference Books:

1. Libreoffice - Getting started 6.0: Libreoffice team, www.libreoffice.org.
2. Use Libreoffice base: Thomas Ecclestone
3. Openoffice for Dummies.

School of Computer Sciences
Department of Computer Science

Name of the Academic Program: Bachelor of Science (Computer Science)

Course Code:UCSCM21101
Title of the Course: Data structures
L-T-P: 4-0-2 Credits: 6

Prerequisite Course / Knowledge (If any):

- The students should hold fundamental knowledge of Computers.
- The students should hold the skill set of knowledge of programming in C .

Course Outcomes (COs)

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

CO-6: Describe representation and functions of arrays. (Level 2: Understand)
CO-7: Analyze an algorithm for searching and sorting techniques in terms of time complexity (Level 4: Analyze)
CO-8: Use stacks, linear lists and queues. (Level 3: Apply)
CO-9: Describe the Linked List (Level 2: Understand)
CO-10: Demonstrate the data structure concepts using 'C' programming. (Level 3: Apply)

Mapping of Course Outcomes (COs) with Program Learning Outcomes (PLOs)

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CO1	3	3	3	3	2	2	1	1	2	2
CO2	3	2	2	3	2	2	2	2	3	3
CO3	3	3	3	2	2	2	1	3	3	3
CO4	3	2	2	3	1	1	1	2	2	2
CO5	3	3	3	2	2	2	1	3	3	3

Write '3' in the box for 'High-level' mapping, 2 for 'Medium-level' mapping, 1 for 'Low-level' mapping.

UCSCM21101: Data structures

Credits: 6 **IA: 60 Marks**
Contact Hrs (L:T:P): 6 (4:0:2) **End Exam: 90 Marks**

Unit 1 **(15 hrs)**

Introduction: Data Structures, Classifications (Primitive & Non-Primitive), Data structure operations (Traversing, inserting, deleting, searching, and sorting).
Review of Arrays. Structures: Array of structures Self-Referential Structures. Dynamic Memory Allocation Functions. Representation of Linear Arrays in Memory, dynamically allocated arrays and Multidimensional Arrays. Demonstration of representation of Polynomials and Sparse Matrices with arrays.

Unit 2 **(15 hrs)**

Stacks: Definition, Stack Operations, Array Representation of Stacks, Stacks using Dynamic Arrays. Different representation of expression. Stack Applications: Infix to postfix conversion, Infix to prefix conversion, evaluation of postfix expression, recursion.

Queues: Definition, Array Representation of Queues, Queue Operations, Circular Queues, Queues and Circular queues, Dequeues, Priority Queues.

Unit 3 **(15 hrs)**

Linked Lists: Definition, classification of linked lists. Representation of different types of linked lists in Memory, Traversing, Insertion, Deletion, Searching, Sorting, and Concatenation Operations on Singly linked list, Doubly Linked lists, Circular linked lists, and header linked lists.

Trees : Terminologies, Binary Trees, Properties of Binary trees, Array and linked Representation of Binary Trees, Binary Tree Traversals - Inorder, postorder, preorder;

Applications of Linked lists – Polynomials, Sparse matrix representation. Programming Example

Unit 4 **(15 hrs)**

Threaded binary trees, Binary Search Trees – Definition, Insertion, Deletion, Traversal, and Searching operation on Binary search tree. Application of Trees-Evaluation of Expression.

Graphs: Definitions, Terminologies, Matrix and Adjacency List Representation of Graphs, Traversal methods: Breadth First Search and Depth First Search.

Hashing: Hash Table organizations, Hashing Functions, Static and Dynamic Hashing.

Reference Books:

1. Ellis Horowitz and SartajSahni, Fundamentals of Data Structures in C, 2nd Ed, Universities Press, 2014.
2. Seymour Lipschutz, Data Structures Schaum's Outlines, Revised 1st Ed, McGraw Hill, 2014.
3. ReemaThareja, Data Structures using C, 3rd Ed, Oxford press, 2012.
4. Gilberg and Forouzan, Data Structures: A Pseudo-code approach with C, 2nd Ed, Cengage Learning,2014.
5. Jean-Paul Tremblay & Paul G. Sorenson, An Introduction to Data Structures with Applications,2nd Ed, McGraw Hill, 2013
6. A M Tenenbaum, Data Structures using C, PHI, 1989

School of Computer Sciences
Department of Computer Science

Name of the Academic Program: Bachelor of Science (Computer Science)
Course Code: UCSCC30200
Title of the Course: OOPs using JAVA
L-T-P = 4-0-2 Credits: 6

Prerequisite Course / Knowledge (If any):

- Students should have the knowledge of procedure oriented programming.

Course Outcomes (COs)

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

CO-1: Distinguish between object oriented paradigm and the procedure oriented paradigm. (Level 2: Understand)
CO-2: Explain the basic principles of object-oriented design. (Level 2: Understand)
CO-3: Write Java application programs using OOP principles and proper program structuring. (Level 3: Apply)
CO-4: Create packages and interfaces. (Level 6: Create)
CO-5: Apply practical experience gained in designing and constructing data models using java programming. (Level 3: Apply)

Mapping of Course Outcomes (COs) with Program Learning Outcomes (PLOs)

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CO1	2	2	3	2	3	3	1	2	2	2
CO2	1	2	2	3	2	3	2	2	3	1
CO3	1	1	3	2	2	2	3	3	2	2
CO4	2	2	2	1	1	1	2	2	2	2
CO5	3	1	3	2	2	2	1	3	2	3

Write ‘3’ in the box for ‘High-level’ mapping, 2 for ‘Medium-level’ mapping, 1 for ‘Low-level’ mapping.

UCSCC30200:OOPs using JAVA

Credits: 6 **IA: 60 Marks**
Contact Hrs (L:T:P): 6 (4:0:2) **End Exam: 90 Marks**

Unit1 **(15 hrs)**

The History and Evolution of Java, C++: The Next Step,The Creation of Java, The Bytecode, The Java Buzzwords, Object-Oriented concepts, The Evolution of Java. Object-Oriented Programming, A First Simple Program,

Unit 2 **(15 hrs)**

Variables and data types, Control Statements, Identifiers, Literals The Java Keywords, The Java Class Libraries. Introducing Classes, Class Fundamentals, A Simple Class, Declaring Objects, Assigning Object Reference Variables, Introducing Methods, Returning a Value, Constructors, Garbage Collection, The finalize( ) Method.

Unit 3 **(15 hrs)**

Inheritance Basics, Member Access and Inheritance, Using super, Creating a Multilevel Hierarchy, Method Overriding, Using Abstract Classes, Using final with Inheritance, Using final to Prevent Overriding, Using final to Prevent Inheritance.

Unit 4 **(15 hrs)**

Packages and Interfaces, nested interfaces, variable in interfaces, Exception handling, exception types.

Reference Books:

1. E. Balaguruswamy, *Programming with Java*, A primer, 4th Edition, Tata McGraw-Hill Publications.
2. Herbet Schildt, The Complete Reference Java, Seventh Edition, MCGrawHill
3. Paul Deital & Harvey Deital (2015), *Java: How to Program*, 10th Edition, Pearson Education.
4. Robert Lafore (2002), *Object Oriented Programming in C++*, 4th Edition, Galgotia publications.
5. Herbert Schildt (2002), *JavaTM2 the Complete Reference*, 5th Edition,Tata McGraw-Hill.

School of Computer Sciences
Department of Computer Science

Name of the Academic Program: Bachelor of Science (Computer Science)
Course Code: UCSCM30200
Title of the Course:core JAVA
L-T-P = 3-0-1 Credits: 4

Prerequisite Course / Knowledge (If any):

- Students should have the knowledge of procedure oriented programming.

Course Outcomes (COs)

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

CO-6: Distinguish between object oriented paradigm and the procedure oriented paradigm. (Level 2: Understand)
CO-7: Explain the basic principles of object-oriented design. (Level 2: Understand)
CO-8: Write Java application programs using OOP principles and proper program structuring. (Level 3: Apply)
CO-9: Create packages and interfaces. (Level 6: Create)
CO-10: Apply practical experience gained in designing and constructing data models using java programming. (Level 3: Apply)

Mapping of Course Outcomes (COs) with Program Learning Outcomes (PLOs)

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CO1	2	2	3	2	3	3	1	2	2	2
CO2	1	2	2	3	2	3	2	2	3	1
CO3	1	1	3	2	2	2	3	3	2	2
CO4	2	2	2	1	1	1	2	2	2	2
CO5	3	1	3	2	2	2	1	3	2	3

Write ‘3’ in the box for ‘High-level’ mapping, 2 for ‘Medium-level’ mapping, 1 for ‘Low-level’ mapping.

UCSCM30200:core Java

Credits: 4 **IA: 40 Marks**
Contact Hrs (L:T:P): 4 (3:0:1) **End Exam: 60 Marks**

Unit1 **(15 hrs)**

The History and Evolution of Java, C++: The Next Step,The Creation of Java, The Bytecode, The Java Buzzwords, Object-Oriented concepts, The Evolution of Java. Object-Oriented Programming, A First Simple Program,

Unit 2 **(15 hrs)**

Variables and data types, Control Statements, Identifiers, Literals The Java Keywords, The Java Class Libraries. Introducing Classes, Class Fundamentals, A Simple Class, Declaring Objects, Assigning Object Reference Variables, Introducing Methods, Returning a Value, Constructors, Garbage Collection, The finalize( ) Method.

Unit 3 **(15 hrs)**

Inheritance Basics, Member Access and Inheritance, Using super, Creating a Multilevel Hierarchy, Method Overriding, Using Abstract Classes, Using final with Inheritance, Using final to Prevent Overriding, Using final to Prevent Inheritance.

Unit 4 **(15 hrs)**

Packages and Interfaces, nested interfaces, variable in interfaces, Exception handling, exception types.

Reference Books:

1. E. Balaguruswamy, *Programming with Java*, A primer, 4th Edition, Tata McGraw-Hill Publications.
2. Herbet Schildt, The Complete Reference Java, Seventh Edition, MCGrawHill
3. Paul Deital & Harvey Deital (2015), *Java: How to Program*, 10th Edition, Pearson Education.
4. Robert Lafore (2002), *Object Oriented Programming in C++*, 4th Edition, Galgotia publications.
5. Herbert Schildt (2002), *JavaTM2 the Complete Reference*, 5th Edition,Tata McGraw-Hill.

School of Computer Sciences
Department of Computer Science

Name of the Academic Program: Bachelor of Science (Computer Science)

Course Code:UCSCS30200

Title of the Course: Android Programming

L-T-P: 2-0-1 Credits: 3

Prerequisite Course / Knowledge (If any):

- Students should have basic knowledge of programming

Course Outcomes (COs)

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

CO-1: Describe the basics of Android programming. (Level 2: Understand)
CO-2: Identify Hardware tools and software tools. (Level 2: Understand)
CO-3: Discuss the procedure for Installing and configuring support tools. (Level 2: Understand)
CO-4: Explain the project structure for the android app. (Level 2: Understand)
CO-5: Apply user interface for app development (Level 3: Apply)

Mapping of Course Outcomes (COs) with Program Learning Outcomes (PLOs)

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CO1	3	3	3	3	2	2	1	1	2	2
CO2	3	2	2	3	2	2	2	2	3	3
CO3	3	3	3	2	2	2	1	3	3	3
CO4	3	2	2	3	1	1	1	2	2	2
CO5	3	3	3	2	2	2	1	3	3	3

Write ‘3’ in the box for ‘High-level’ mapping, 2 for ‘Medium-level’ mapping, 1 for ‘Low-level’ mapping.

UCSCS30200 :Android Programming

Credits: 3 **IA: 30 Marks**

Contact Hrs (L:T:P): 3 (2:0:1) **End Exam: 45 Marks**

Unit 1 **(15 hrs)**

Introduction to Android, Create Your First Android App, Layouts, Views and Resources, Text and Scrolling Views, Build your first app, Activities, Testing, debugging and using support libraries.Understanding Activities and Intents, The Activity Lifecycle and ManagingState Activities and Implicit Intents.

Unit 2 **(15 hrs)**

The Android Studio Debugger, Testing your App, The Android Support Library, User Input Controls, Menus, Screen Navigation, Recycler View.

Unit 3 **(15 Hrs)**

Drawables, Styles and Themes, Material Design, Providing Resources for Adaptive Layouts, Testing the User Interface, Triggering,scheduling and optimizing background tasks: Notifications, Scheduling Alarms, Transferring Data Efficiently.

Reference Books :

1. Google Developer Training, "Android Developer Fundamentals Course – Concept Reference", Google Developer Training Team, 2017. https://www.gitbook.com/book/googledeveloper-training/android-developer-fundamentals-course-concepts/details (Download pdf file from the above link)
2. Michael Burton, Android App Development For Dummies 3rd Edition, Kindle Edition
3. John Horton, Android Programming for Beginners, Packet

School of Computer Sciences
Department of Computer Science

Name of the Academic Program: Bachelor of Science (Computer Science)

Course Code: UCSTD30200
Title of the Course: Computer Networks
L-T-P =3-0-0 Credits: 3

Prerequisite Course / Knowledge (If any):

- Students should have the knowledge of procedure oriented programming.

Course Outcomes (COs)

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

CO-1: Explain OSI reference model and TCP/IP model. (Level 2: Understand)
CO-2: Distinguish between Guided Transmission Media and Wireless Transmission, (Level 2: Understand)
CO-3: Demonstrate Digital Modulation And Multiplexing, (Level 3: Apply)
CO-4: Describe Network Service Model (Level 2: Understand))
CO-5: Demonstration on Routing Algorithms(Level 3: Apply)

Mapping of Course Outcomes (COs) with Program Learning Outcomes (PLOs)

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CO1	3	3	3	3	2	2	1	1	2	2
CO2	3	2	2	3	2	2	2	2	3	3
CO3	3	3	3	2	2	2	1	3	3	3
CO4	3	2	2	3	1	1	1	2	2	2
CO5	3	3	3	2	2	2	1	3	3	3

Write ‘3’ in the box for ‘High-level’ mapping, 2 for ‘Medium-level’ mapping, 1 for ‘Low-level’ mapping.

UCSTD30200:Computer Networks

Credits: 3 **IA: 30 Marks**

Contact Hrs (L:T:P): 3 (3:0:0) **End Exam: 45 Marks**

Unit 1 **(15 hrs)**

Internet: Introduction, History of internet, applications of internet, Network, Uses Of Computer Networks, Mobile Users, Social Issues, Network Hardware, Types of Networks, Network software, Connection-Oriented Versus Connectionless Service, The OSI Reference Model, The TCP/IP Reference Model.

Unit 2 **(15 hrs)**

The Physical Layer, Guided Transmission Media, Wireless Transmission, Infrared Transmission, Communication Satellites, Digital Modulation And Multiplexing, The Public Switched Telephone Network.

Unit 3 **(15 hrs)**

Introduction and Network Service Model, virtual circuits & datagrams, what is inside the router? Internet protocol (IP), Forwarding & Addressing in internet, Routing Algorithms, Routing in the internet, Broad & Multicast Routing.

Reference Books:

1. Data Communications & Networking Fourth Edition, Behrouz A Forouzan
2. Computer Networking" Third Edition, James F. Kurose, Keith W. Ross
3. Tanenbaum, Wethrall, Computer Networks 5th edition, Prentice Hall

School of Computer Sciences
Department of Computer Science

Course Code: **UCSCC40201**
Title of the Course: **Computer Organization and Architecture**
L-T-P: 4-0-2 Credits: 6

Prerequisite Course / Knowledge (If any):

- The students should hold basic knowledge of Computers.
- The students should hold the skill set of basic Algebra.

Course Outcomes (COs)

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

CO-1: Summarize the concepts of Number system, Boolean algebra and Logic gates.(Level 5: Evaluate)
CO-2: Experiment on Simplification of Boolean functions and Sequential Circuits. (Level 4: Analyze)
CO-3: Prepare an architectural logic and control design for the processor. (Level 3: Apply)
CO-4: Describe the basic concepts of microprocessors. (Level 2: Understand)
CO-5: Discuss the structure of memory and its components. (Level 2: Understand)

Mapping of Course Outcomes (COs) with Program Outcomes (POs)

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	3	2	2	--	3	1	2	--
CO2	3	3	2	--	--	--	2	1	1	--
CO3	3	2	2	--	--	--	3	--	2	2
CO4	3	1	2	--	--	--	2	--	1	--
CO5	2	1	2	2	--	1	1	--	--	--

UCSCC40201: Computer Organization and Architecture

Credits: 6 **IA: 60 Marks**
Contact Hrs (L:T:P): (4:0:2) **End Exam: 90 Marks**

Unit 1 **(15 hrs)**

Number System: Introduction, Decimal, Binary, Octal, Hexadecimal, 1's and 2's Complements, Inter conversion of numbers, Codes: Character codes – ASCII, EBCDIC,. Binary Addition, Binary Subtraction, Signed Numbers, Addition /Subtraction of numbers in 2's complement notation, Binary Multiplication, Binary division, Floating point representation of numbers, Arithmetic operations with normalized floating point numbers.

Boolean Algebra and Logic Gates: Introduction, Basic definition, Axiomatic Definition, Basic theorem and Properties of Boolean algebra, Minterms and Maxterms, Logic Operations, Digital logic gates, IC digital logic families.

Unit 2 **(15 hrs)**

Simplification of Boolean functions: Introduction, Different types of map method, product of sum simplification, NAND or NOR implementation, don't care condition,

Combinational and Sequential Circuits: Introduction, Half- adder, Full-Adder, Subtractors, Universal Gates, Flip-flops (SR, JK, D & T), Edge Triggering of Flip–Flops.

Unit 3 **(15 hrs)**

Digital Components: Integrated circuits,Decoders, Encoders, Multiplexers, Registers, Shift Registers, Counters, Binary Counter with Parallel Load, Memory Unit

Basic Computer Organization and Design: Stored Program Organization and InstructionCodes, Computer Registers, Common Bus System, Computer Instructions, Timing and Control, Instruction Cycle, Memory-Reference Instructions, Input-Output, Program Interrupt and Design of Accumulator Logic.

Unit 4 **(15 hrs)**

Input-Output Organization: Peripheral Devices, Input-Output Interface, Synchronous and Asynchronous Data Transfer, Handshaking, Modes of Transfer, Programmed I/ O and Interuppet initiated I/O , Priority Interrupt, Interrupt cycle, Direct Memory Access (DMA), Serial Communication.

Memory System Design: Memory Origination, Memory Hierarchy, Main Memory (RAM/ROM chips), Auxiliary memory, Associative memory, Cache Memory and Virtual Memory.

Reference Books:

1. M. Morris Mano (2007), *Computer System Architecture*, Prentice Hall.
2. William Stallings (2015), *COArchitecture Designing for Performance*, Pearson.
3. John P Hayes (1998), *Computer Architecture and Organization*, Tata McGraw Hill.
4. Bartee, T.C. (2001), *Digital Computer Fundamentals*, MC Graw Hill.
5. Mathur A.P. (1995), *Introduction to Microprocessors*, Tata Mc Graw Hill.

School of Computer Sciences
Department of Computer Science

Name of the Academic Program: Bachelor of Science (Computer Science)

Course Code: UCSCC40202
Title of the Course: Python Programming
L-T-P: 4-0-0 Credits: 4
Prerequisite Course / Knowledge (If any):

- Students should have knowledge of computers and programming.

Course Outcomes (COs)

After completion of this course successfully, the students will be able to
CO-1 Explain the fundamentals of python programming. (Level 2 Understand)
CO-2 Explain the basic principles of functions and modules. (Level 2 Understand)
CO-3 Describe file handling and exception handling. (Level 2 Understand)
CO-4 Identify and fix common errors in Python programs. (Level 4 Analyze)
CO-5 Write codes in Python to solve mathematical or real world problems. (Level 3 Apply)

Mapping of Course Outcomes (COs) with Program Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	3	2	2	1	1	2	2
CO2	3	2	2	3	2	2	2	2	3	3
CO3	3	3	3	2	2	2	1	3	3	3
CO4	3	2	2	3	1	1	1	2	2	2
CO5	3	3	3	2	2	2	1	3	3	3

UCSCC40202:Python Programming

Credits: 6 **IA: 60 Marks**
Contact Hrs (L:T:P): 6 (4:0:2) **End Exam: 90 Marks**

Unit 1 **(15 hrs)**

Introduction to Python Language: History of Python, What is Python mainly used for?, Strengths and Weaknesses, IDLE, Dynamic Types, Naming Conventions.

The Context of Software Development: Software, Learning Programming with Python. Values and Variables-Integer and String Values-Identifiers-User Input-String Formatting, String Values, String Operations, String Slices, String Operators

Unit2 **(15 hrs)**

Data Collections and Language Component: Numeric Data Types, Conversions, Built-in Functions, Expressions and Arithmetic- Expressions, Arithmetic Examples.

Control Flow and Syntax: range() function Indenting, if Statement, If Else Statement, elif Statement, For Loops While Loops, Loop Control Statements.

Unit3 **(15 hrs)**

List: Creating List,Traversing through List, List Methods, User input for list

Tuple: Creating Tuple, Traversing through tuple, Tuple methods

Set: Creating set,Traversing through set, set Operations, User input for set.

Dictionary :Creating Dictionary,Traversing throughDictionary, Dictionary Methods, User input for Dictionary

Unit 4

Functions and Modules: Introduction, Defining Your Own Functions, Parameters, Function Documentation, Keyword and Optional Parameters, Passing Collections to a Function, Variable Number of Arguments, Scope, Passing Functions to a Function, Lambda function.

Objects and Classes: Classes in Python, Principles of Object Orientation, Creating Classes, Instance Methods. __init__ method, Inheritance.

Reference Books:

1. Charles Dierbach (2015), *Introduction to Computer Science using Python*, Wiley,1st Edition ISBN-10: 81265560132015

2. John Zelle (2010), *Python Programming: An Introduction to Computer Science*, 2nd Edition.
3. Zed A.Shaw (2017), Learn Python the Hard Way Paperback, Pearson Education, 3rd Edition ISBN-10: 9332582106.
4. Felix Alvaro, *PYTHON*, Easy Python Programming for Beginners, Your Step-By-Step Guide to Learning Python Programming.
5. Paul Barry *(2010), Head First Python,* O' Reilly Publishers, 1st Edition, ISBN: 1449382673.

School of Computer Sciences
Department of Computer Science

Name of the Academic Program: Bachelor of Science (Computer Science)

Course Code: UCSCM40201
Title of the Course: Python Programming
L-T-P: 3-0-1 Credits: 4
Prerequisite Course / Knowledge (If any):

- Students should have knowledge of computers and programming.

Course Outcomes (COs)

After completion of this course successfully, the students will be able to
CO-1 Explain the fundamentals of python programming. (Level 2 Understand)
CO-2 Explain the basic principles of functions and modules. (Level 2 Understand)
CO-3 Describe file handling and exception handling. (Level 2 Understand)
CO-4 Identify and fix common errors in Python programs. (Level 4 Analyze)
CO-5 Write codes in Python to solve mathematical or real world problems. (Level 3 Apply)

Mapping of Course Outcomes (COs) with Program Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	3	2	2	1	1	2	2
CO2	3	2	2	3	2	2	2	2	3	3
CO3	3	3	3	2	2	2	1	3	3	3
CO4	3	2	2	3	1	1	1	2	2	2
CO5	3	3	3	2	2	2	1	3	3	3

UCSCM40201:Python Programming

Credits: 4 **IA: 40 Marks**

Contact Hrs (L:T:P): 4 (3:0:1) **End Exam: 60 Marks**

Unit 1 **(15 hrs)**

Introduction to Python Language: History of Python, What is Python mainly used for?, Strengths and Weaknesses, IDLE, Dynamic Types, Naming Conventions.

The Context of Software Development: Software, Learning Programming with Python. Values and Variables-Integer and String Values-Identifiers-User Input-String Formatting, String Values, String Operations, String Slices, String Operators

Unit2 **(15 hrs)**

Data Collections and Language Component: Numeric Data Types, Conversions, Built-in Functions, Expressions and Arithmetic- Expressions, Arithmetic Examples.

Control Flow and Syntax: range() function Indenting, if Statement, If Else Statement, elif Statement, For Loops While Loops, Loop Control Statements.

Unit3 **(15 hrs)**

List: Creating List,Traversing through List, List Methods, User input for list

Tuple: Creating Tuple, Traversing through tuple, Tuple methods

Set: Creating set,Traversing through set, set Operations, User input for set.

Dictionary :Creating Dictionary,Traversing throughDictionary, Dictionary Methods, User input for Dictionary

Unit 4

Functions and Modules: Introduction, Defining Your Own Functions, Parameters, Function Documentation, Keyword and Optional Parameters, Passing Collections to a Function, Variable Number of Arguments, Scope, Passing Functions to a Function.

Objects and Classes: Classes in Python, Principles of Object Orientation, Creating Classes, Instance Methods.

Reference Books:

6. Charles Dierbach (2015), *Introduction to Computer Science using Python*, Wiley,1st Edition ISBN-10: 81265560132015
7. John Zelle (2010), *Python Programming: An Introduction to Computer Science*, 2nd Edition.

8. Zed A.Shaw (2017), Learn Python the Hard Way Paperback, Pearson Education, 3rd Edition ISBN-10: 9332582106.
9. Felix Alvaro, *PYTHON*, Easy Python Programming for Beginners, Your Step-By-Step Guide to Learning Python Programming.
10. Paul Barry *(2010), Head First Python,* O' Reilly Publishers, 1st Edition, ISBN: 1449382673.