

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. (Six Units)

F.Y.B.Sc.

Syllabus – F.Y.B.Sc.-Computer-Science1

Semester	Course Code	Course Title	Weightage	Credits
I	USCS101	Computer Organization and Design	100	2
	USCS102	Programming with Python- I	100	2
	USCS103	Free and Open Source Software	100	2
	USCS104	Database Systems	100	2
	USCS105	Discrete Mathematics	100	2
	USCS106	Descriptive Statistics and Introduction to Probability	100	2
	USCS107	Soft Skills Development	100	2
	USCSP01	Practical of USCS101 + USCS102 + USCS103+USCS104+USCS105+USCS106	300	6
II	USCS201	Programming with C	100	2
	USCS202	Programming with Python– II	100	2
	USCS203	Linux	100	2

	USCS204	Data Structures	100	2
	USCS205	Calculus	100	2
	USCS206	Statistical Methods and Testing of Hypothesis	100	2
	USCS207	Green Technologies	100	2
	USCSP02	Practical of USCS201 + USCS202 + USCS203+USCS204+USCS205+USCS206	300	6

S.Y.B.Sc.

Syllabus – S.Y.B.Sc. Computer Science Sem III & IV

Semester	Course Code	Course Title	Weightage	Credits
III	USCS301	Theory of Computation	100	2
	USCS302	Core JAVA	100	2
	USCS303	Operating System	100	2
	USCS304	Database Management Systems	100	2
	USCS305	Combinatorics and Graph Theory	100	2
	USCS306	Physical Computing and IoT Programming	100	2
	USCS307	Skill Enhancement: Web Programming	100	2
	USCSP301	USCS302+USCS303+USCS304	150	3
	USCSP302	USCS305+USCS306+USCS307	150	3
IV	USCS401	Fundamentals of Algorithms	100	2
	USCS402	Advanced JAVA	100	2
	USCS403	Computer Networks	100	2

	USCS404	Software Engineering	100	2
	USCS405	Linear Algebra using Python	100	2
	USCS406	.NET Technologies	100	2
	USCS407	Skill Enhancement: Android Developer Fundamentals	100	2
	USCSP401	USCS401+ USCS402+ USCS403	150	3
	USCSP402	USCS405+ USCS406+ USCS407	150	3

T.Y.B.Sc.

Syllabus

4.211 T.Y.B.Sc. Computer Science Sem V & VI-1

4.212 T.Y.B.Sc. Computer Science (Web Design and Tech) Sem V & VI

Semester	Course Code	Course Title	Weightage	Credits
V	USCS501	Data Communication and Networking	100	2.5
	USCS502	Advanced Java Programming– I	100	2.5
	USCS503	Mobile Application Development	100	2.5
	USCS504	Data Management using PL/SQL-I	100	2.5
	USCSP501	Practical of USCS501 + USCS502	100	3
	USCSP501	Practical of USCS503 + USCS504	100	3
	USACWD501	.Net Technologies	100	2
	USACWD5P1	Practical of USACWD501	100	2
VI	USCS601	Advanced Networking & Security	100	2.5

	USCS602	Advanced Java Programming – II	100	2.5
	USCS603	Software Engineering and Testing	100	2.5
	USCS604	Data Management using PL/SQL-II	100	2.5
	USCSP601	Practical of USCS602 + USCS604	100	3
	USCSP602	Practical of USCS601 + USCS603	100	3
	USACWD602	Advanced Web Technology	100	2
	USACWD6P2	Practical of USACWD602	100	2

PO, PSOS AND CO

PO & PSO

- Learner understands structure and function of operating system.
- Learner is able to utilize his knowledge to formulate a database for real world entities.
- Learner has capabilities to design formulations of computing models and its applications in diverse areas.
- Learner can analyse real world problems using statistical and combinatorial methods
- Learner demonstrates working of search engines using eigen values and eigen vectors in Linear Algebra.
- Learner applies his knowledge and skills to develop standalone applications.
- Learner has knowledge of embedded programming and robotics.
- Learner applies his skills knowledge to create dynamic websites using open-source platforms.

Course Outcome

Class	Semester	Course Code	Course Title	Course Outcomes
F.Y.B.Sc CS	I	USCS101	Computer Organization and Design	1) Learners learn about how computer systems work and underlying principles 2) Learners understand the basics of digital electronics needed for computers 3) Learners understand the basics of instruction set architecture for reduced and complex instruction sets 4) Learners understand the basics of processor structure and operation 5) Learners understand how data is transferred between the processor and I/O devices
		USCS102	Programming with Python- I	1) Learners are able to understand the concepts of programming before actually starting to write programs. 2) Learners are able to develop logic for Problem Solving. 3) Learners are made familiar about the basic constructs of programming such as data, operations, conditions, loops, functions etc. 4) Learners are able to apply the problem-solving skills using syntactically simple language
		USCS103	Free and Open Source Software	1) Upon completion of this course, students have a good working knowledge of Open Source ecosystem, its use, impact and importance.

				2) This course helps student to learn Open Source methodologies, case studies with real life examples.
		USCS104	Database Systems	<p>1) Students are able to evaluate business information problem and find the requirements of a problem in terms of data.</p> <p>2) Learners are able to design the database schema with the use of appropriate data types for storage of data in database.</p> <p>3) Learners are able to create, manipulate, query and back up the databases.</p>
		USCS105	Discrete Mathematics	<p>1) Provides overview of theory of discrete objects, starting with relations and partially ordered sets.</p> <p>2) Study about recurrence relations, generating function and operations on them.</p> <p>3) Give an understanding of graphs and trees, which are widely used in software.</p> <p>4) Provide basic knowledge about models of automata theory and the corresponding formal languages</p>
		USCS106	Descriptive Statistics and Introduction to Probability	<p>1) Learner knows descriptive statistical concepts</p> <p>2) Learner study probability concept required for Computer learner</p>
		USCS107	Soft Skills Development	<p>1) Learner knows about various aspects of soft skills and learns ways to develop personality</p> <p>2) Learners understand the importance and type of communication in personal and professional environment.</p> <p>3) Provides insight into much needed technical and non-technical qualities in career planning.</p> <p>4) Learners learn about Leadership, team building, decision making and stress management</p>

	II	USCS201	Programming with C	<p>1) Learners are able to write, compile and debug programs in C language.</p> <p>2) Learners are able to use different data types in a computer</p>
				<p>program.</p> <p>3) Learners are able to design programs involving decision structures, loops and functions.</p> <p>4) Learners are able to explain the difference between call by value and call by reference</p> <p>5) Learners are able to understand the dynamics of memory by the use of pointers.</p> <p>6) Learners are able to use different data structures and create/update basic data files.</p>
		USCS202	Programming with Python– II	<p>1) Learners are able to understand how to read/write to files using python.</p> <p>2) Learners are able to catch their own errors that happen during execution of programs.</p> <p>3) Learners get an introduction to the concept of pattern matching.</p> <p>4) Learners are made familiar with the concepts of GUI controls and designing GUI applications.</p> <p>5) Learners are able to connect to the database to move the data to/from the application.</p> <p>6) Learners know how to connect to computers, read from URL and send email</p>
		USCS203	Linux	<p>1) Upon completion of this course, students have a good working knowledge of Linux, from both a graphical and command line perspective, allowing them to easily use any Linux distribution.</p> <p>2) This course helps student to learn advanced subjects in computer science practically.</p>

				3) Learner are able to progress as a Developer or Linux System Administrator using the acquired skill set.
		USCS204	Data Structures	1) Learns about Data structures, its types and significance in computing 2) Explores about Abstract Data types and its implementation
				3) Ability to program various applications using different data structure in Python
		USCS205	Calculus	1) Learner understands Mathematical concepts like limit, continuity, derivative, integration of functions. 2) Ability to appreciate real world applications which uses these concepts. 3) Learner are able to formulate a problem through Mathematical modelling and simulation
		USCS206	Statistical Methods and Testing of Hypothesis	1) learner knows descriptive statistical concepts 2) Learner studies probability concept required for Computer learners
		USCS207	Green Technologies	1) Learn about green IT can be achieved in and by hardware, software, network communication and data center operations. 2) Understand the strategies, frameworks, processes and management of green IT
S. Y. B. Sc CS	III	USCS301	Theory of Computation	1. Learner Understands Grammar and Languages 2. Learner Learns about Automata theory and its application in Language Design 3. Learner Learns about Turing Machines and Pushdown Automata 4. Learner understands Linear Bound Automata and its applications

		USCS302	Core JAVA	<ol style="list-style-type: none"> 1. Learner learns Object oriented programming concepts using Java. 2. Learner gains knowledge of input, its processing and getting suitable output.
				<ol style="list-style-type: none"> 3. Learner understands design, implement and evaluate classes and applets. 4. Learner gains knowledge and implementation of AWT package
		USCS303	Operating System	<ol style="list-style-type: none"> 1. To provide a understanding of operating system, its structures and functioning
				<ol style="list-style-type: none"> 2. Learner understands algorithms used by operating systems for various purposes.
		USCS304	Database Management Systems	<ol style="list-style-type: none"> 1. Learner masters concepts of stored procedure and triggers and its use. 2. Learner learns about using PL/SQL for data management 3. Learner understands concepts and implementations of transaction management and crash recovery
		USCS305	Combinatorics and Graph Theory	<ol style="list-style-type: none"> 1. Learner appreciates beauty of combinatorics and how combinatorial problems naturally arise in many settings. 2. Learner understands the combinatorial features in real world situations and Computer Science applications. 3. Learner applies combinatorial and graph theoretical concepts to understand Computer Science concepts and apply them to solve problems

		USCS306	Physical Computing and IoT Programming	<ol style="list-style-type: none"> 1. Learner understands System on Chip Architectures. 2. Learner learns Raspberry Pi with hardware and installation. 3. Learner learns physical interfaces and electronics of Raspberry Pi and program them using practical's 4. Learner knows how to make consumer grade IoT safe and secure with proper use of protocols
		USCS307	Skill Enhancement: Web Programming	<ol style="list-style-type: none"> 1. Learner designs valid, well-formed, scalable, and meaningful pages using emerging technologies. 2. Learner understands the various platforms, devices, display resolutions, viewports, and browsers that render websites 3. Learner knows how to develop and implement client-side and server-side scripting language programs.
				<ol style="list-style-type: none"> 4. Learner gains knowledge to develop Database Driven Websites. 5. Learner learns to design and apply XML to create a markup language for data and document centric applications.
	IV	USCS401	Fundamentals of Algorithms	<ol style="list-style-type: none"> 1. Learner understands the concepts of algorithms for designing good program 2. Learner gains knowledge to implement algorithms using Python
		USCS402	Advanced JAVA	<ol style="list-style-type: none"> 1) Learner understands the concepts related to Java Technology 2) Learner explores and understands use of Java Server Programming
		USCS403	Computer Networks	<ol style="list-style-type: none"> 1. Learner are able to understand the concepts of networking, which are important for them to be known as a 'networking professionals'. 2. Useful to proceed with industrial requirements and International vendor certifications
		USCS404	Software Engineering	<ol style="list-style-type: none"> 1. Learner learns various software development life cycle models. 2. Learner is able to model real world entities in appropriate models.

				3. Learner is able to write test cases on a given software.
		USCS405	Linear Algebra using Python	1. Appreciate the relevance of linear algebra in the field of computer science. 2. Understand the concepts through program implementation
		USCS406	NET Technologies	1. Learner understands the .NET framework fundamentals. 2. After completing this course learner develops a proficiency in the C# programming language. 3. Proficiently develops ASP.NET web applications using C#. 4. Learner gains knowledge on how to use ADO.NET for data persistence in a web application.
		USCS407	Skill Enhancement: Android Developer Fundamentals	1) Learner understands the requirements of Mobile programming environment. 2) Learner learns about basic methods, tools and techniques for developing Apps 3) Learner practices App development on Android Platform 4) Learners develop working prototypes of working systems for various uses in daily lives.
T. Y. B. Sc CS	V	USCS501	Data Communication and Networking	1. Learners are able to understand the concepts of networking, which are important for them. 2. Learner may proceed with international vendor certifications in Networking.
		USCS502	Advanced Java Programming– I	1. Learner learns implementation of Advanced Java Programming 2. Learner is able to create Graphical User Interfaces using Swing 3. Learner performs database operations from Java
		USCS503	Mobile Application Development	1) Learner understands the requirements of Mobile programming environment. 2) Learner learns about basic methods, tools and techniques for developing Apps

		USCS504	Data Management using PL/SQL-I	<ol style="list-style-type: none"> 1. Learner learns PL-SQL data types for storing various types of data. 2. Learner knows how to use loops, cursors and other constructs
		USACWD501	.Net Technologies	<ol style="list-style-type: none"> 1. Learner gains Knowledge of .NET technologies framework 2. Learner understands and implements various controls for Creating a web Application 3. Learner understands the security aspects of web Application.
	VI	USCS601	Advanced Networking & Security	<ol style="list-style-type: none"> 1. Learners are able to understand the concepts of networking and security, which are important for them to be known as a 'networking professionals. 2. Learner may proceed with International vendor certifications in Networking
		USCS602	Advanced Java Programming – II	<ol style="list-style-type: none"> 1. Learner learns advance web technologies like Servlets and JSP 2. Enables learners to create and use web services
		USCS603	Software Engineering and Testing	<ol style="list-style-type: none"> 1. Learner learns various software development life cycle models. 2. Learner is able to model real world entities in appropriate models. 3. Learner is able specify level of confidence on given software by performing software testing.
		USCS604	Data Management using PL/SQL-II	<ol style="list-style-type: none"> 1. Learner learns PL-SQL data types for storing various types of data. 2. Learner knows how to use loops, cursors and other constructs.
		USACWD602	Advanced Web Technology	<ol style="list-style-type: none"> 1. Learner learns about using XML for managing Data. 2. Learner learns about using Ajax programming. 3. Learner learns about PHP and jQuery for developing web applications.

FACILITIES

- Separate computer lab for T.Y.B.Sc students.
- ICT enabled Computer Laboratory for F.Y. and S.Y.B.Sc students
- Faculty room for Computer Department faculties

RESULTS

Year	Students Appeared	Students Passed	Percentage Result	‘O’ Grade	‘A’ Grade	‘B’ Grade	‘C’ Grade	‘D’ Grade	‘E’ Grade
2015-16	03	03	100%	–	–	–	02	–	–
2016-17	05	05	100%	–	–	02	01	–	–
2017-18	02	02	100%	–	05	01	–	01	–
2018-19	03	03	100%	–	01	–	02	01	–
2019-20	02	02	100%	–	–	03	02	–	–
2020-21	04	04	100%	-					

FUTURE PLANS

To start post graduate course