YEWS NATIONAL SENIOR COLLEGE

Department of Computer Science

Program Specific Outcomes – B.Sc. (Computer Science)

PSO1: Ability to understand the principles and working of computer systems. Students have knowledge about the hardware and software aspects of computer systems.

PSO2: Ability to design and develop computer programs and understand the structure and development methodologies of software systems.

PSO3: Ability to apply their skills in the field of algorithms, networking, web design, cloud computing and data analytics.

PSO4: Ability to apply knowledge to provide innovative novel solutions to existing problem and identify research gaps.

PSO5: Effectively utilizing their knowledge of computing principles and mathematical theory to develop sustainable solutions to current and future computing problems.

PSO6: Design, implement, and evaluate a computational system to meet desired needs of the industry.

PSO7: Capable of adapting to new technologies and constantly upgrade their skills with an attitude towards independent and lifelong learning.

PSO8: Perform professionally with social, cultural and ethical responsibility as an individual as well as in multifaceted teams with positive attitude.

PSO9: Able to apply software engineering principles and practices to provide software solution.

PSO10: Develop their skills to solve problems in the broad area of programming concepts and appraise environmental and social issues with ethics and manage different projects in inter-disciplinary field

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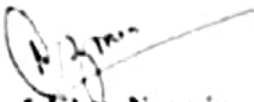### Course Outcomes – F.Y.B.Sc. (CS)2020-21

Sem-I (Credit Pattern)

	Problem Solving Using Computers and 'C' Programming
CO1	Explore algorithmic approaches to problem solving.
CO2	Develop modular programs using control structures and arrays in 'C'.
CO3	Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.
	Databases Management System
CO1	Solve real world problems using appropriate set, function, and relational models.
CO2	To understand user requirements and frame it in data model
CO3	To understand creations, manipulation and querying of data in databases.
	Practical course on Problem Solving using Computer and 'C' programming and Database Management Systems
CO1	Devise pseudo codes and flowchart for computational problems.
CO2	Write, debug and execute simple programs in 'C'.
CO3	Create database tables in postgre SQL.
	Discrete Mathematics
CO1	Write an argument using logical notation and determine if the argument is or is not valid.
CO2	Demonstrate the ability to write and evaluate a proof or outline the basic structure
CO3	Understand the basic principles of sets and operations in sets.
	Matrix Algebra
CO1	Find the determinant of a product of square matrices, of the transpose of a square matrix, and of the inverse of an invertible matrix
CO2	A students should develop an appreciation for the literature on the subject and be able to read and present results from the literature.
CO3	Learn to solve system of linear equation.

	Math's Practical
CO1	Learn Maxima software
CO2	Problem solve on Discrete mathematics and matrix algebra using maxima software
CO3	Knowledge of application of mathematics
	Descriptive Statistics I
CO1	Know the association between the attributes.
CO2	Calculate the simple linear regression equation for a set of data. .
CO3	Calculate and interpret the correlation between two variables.
	Mathematical Statistics
CO1	The purpose of this course is to familiarize students with basics of Statistics. This will be essential for prospective researchers and professionals to know these basics
CO2	Students will create quantitative models to solve real world problems in appropriate contexts
	Statistical Practical Paper I
CO1	The purpose of this course is to familiarize students with basics of Statistics. This will be essential for prospective researchers and professionals to know these basics
	Semiconductor Devices and Basic Electronic System
CO1	Apply circuit laws, theorems and methods of systematic analysis to predict the steady state behavior of simple linear DC and AC circuit
CO2	Use piecewise linear models to predict the steady state behaviour of simple diode and transistor circuits, AC and DC motors.
CO3	Explain the transient behavior of RLC circuits with reference to their differential equations.
	Principles of Digital Electronics
CO1	Have a thorough understanding of the fundamental concepts and techniques used in digital electronics.
CO2	To understand and examine the structure of various number systems and its application in digital design
CO3	The ability to understand, analyze and design various combinational and sequential circuits.

	Electronics Practical
CO1	Distinguish between analog and digital systems.
CO2	Design and test various types of oscillators.
CO3	Apply Boolean laws and K-map to simplify the digital circuits.

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|	**Advanced 'C' Programming**
CO1	Develop modular programs using control structures, pointers, arrays, strings and structures
CO2	Design and develop solutions to real world problems using C.
CO3	Write programs that perform operations using derived data types.
	Relational Database Management Systems
CO1	Design E-R Model for given requirements and convert the same into database tables.
CO2	Use database techniques such as SQL & PL/SQL.
CO3	Explain transaction Management in relational database System.
CO4	Use advanced database Programming concepts
	Practical Course on Advanced 'C' Programming and Relational Database Management Systems
CO1	Write, debug and execute programs using advanced features in 'C'.
CO2	To use SQL & PL/SQL.
CO3	To perform advanced database operations.
	Graph Theory
CO1	A students should be able to work with graphs and identify certain parameters and properties of the given graphs.
CO2	A students should be able to solve basic exercises of the type: given a graph with properties X, prove that the graph also has property Y.
CO3	Select and use appropriate mathematical formulae or techniques in order to process the information and draw the relevant conclusion.
	Linear Algebra
CO1	A students should be able to write cohesive and comprehensive solutions to exercises and be able to defend their arguments.
CO2	A students should develop an appreciation for the literature on the subject and be able to read and present results from the literature.
CO3	A student should be made aware of history of mathematics and hence of its past, present and future role as part of our culture. .

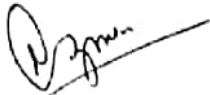|	
	Math's Practical
CO1	Locate the x and y intercepts, any undefined points, and any asymptotes.
CO2	apply the techniques from the previous section to graph a fourth degree polynomial or higher
CO3	Prove basic set equalities
	Method of applied statistics
CO1	Know the association between the attributes.
CO2	Calculate the simple linear regression equation for a set of data. .
CO3	Calculate and interpret the correlation between two variables.
	Continuous Probability Distributions and testing of hypothesis
CO1	The purpose of this course is to familiarize students with basics of Statistics. This will be essential for prospective researchers and professionals to know these basics
CO2	Students will create quantitative models to solve real world problems in appropriate contexts
	Statistics Practical Paper II
CO1	The purpose of this course is to familiarize students with basics of Statistics. This will be essential for prospective researchers and professionals to know these basics
	Instrumentation System
CO1	Apply circuit laws, theorems and methods of systematic analysis to predict the steady state behavior of simple linear DC and AC circuit
CO2	Explain the transient behavior of RLC circuits with reference to their differential equations.
CO3	Simulate simple analog circuits to verify their behavior.
	Basics of Computer Organisation
CO1	Have a thorough understanding of the fundamental concepts and techniques used in digital electronics.
CO2	The ability to understand, analyze and design various combinational and sequential circuits.
CO3	Ability to identify basic requirements for a design application and propose a cost effective solution
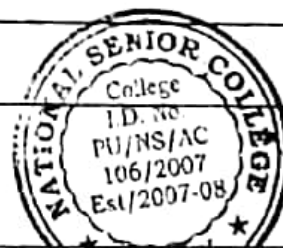
CO1	Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.
CO2	Understand dynamic memory management techniques using pointers, constructors, destructors, etc
CO3	Describe the concept of function overloading, operator overloading, virtual functions and polymorphism.
CO4	To study the various structures or methods of organizing data in computer's memory and efficiently implement them.
	Computational Geometry
CO1	Construct algorithms for simple geometrical problems.
CO2	Implement computational geometry algorithms.
CO3	Use line-point duality to develop efficient algorithms
CO4	Solve linear programs geometrically
	Operations Research
CO1	Construct linear integer programming models and discuss the solution techniques.
CO2	Set up decision models and use some solution methods for nonlinear optimization problems.
CO3	propose the best strategy using decision making methods under uncertainty and game theory
CO4	Solve multi-level decision problems using dynamic programming method.
	Mathematics Practical: Python Programming Language-II
CO1	use suitable programming language as a tool to solve mathematical problems.
CO2	Understand and work with object oriented programming context.
CO3	Work with various data format.
	Embedded System Design
CO1	To understand the difference between general computing and the Embedded systems
CO2	To know the fundamentals of embedded systems
CO3	Understand the use of Single board Computer (Such as Raspberry Pi) for an embedded system application.
CO4	Familiar with the programming environment to develop embedded systems and their interfaces with peripheral devices.
CO5	To develop familiarity with tools used to develop in an embedded environment.
	Wireless Communication and Internet of Things
CO1	Know working of wireless technologies such as Mobile communication, GSM, GPRS
CO2	Become familiar with 3G and 4G Cellular Network Technologies for Data
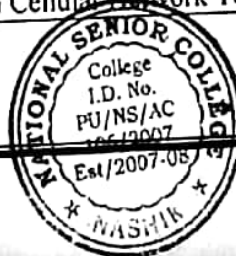
		Electronics Practical
	CO1	Identify the various digital ICs and understand their operation.
	CO2	Design and test rectifiers, clipping circuits, clamping circuits and voltage regulators.
	CO3	Design and test a power amplifier.

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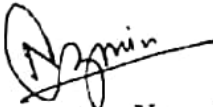### Course Outcomes - S.Y.B.Sc. (CS) 2020-21

SEM-III(Credit Pattern)

		Data Structures and Algorithms – I
	CO1	To use well-organized data structures in solving various problems.
	CO2	To differentiate the usage of various structures in problem solution.
	CO3	Implementing algorithms to solve problems using appropriate data structures.
		Software Engineering
	CO1	Compare and chose a process model for a software project development.
	CO2	Identify requirements analyze and prepare models.
	CO3	Prepare the SRS, Design document, Project plan of a given software system
		Practical course on CS 231 (Data Structures and Algorithms I) and CS 232 (Software Engineering)
	CO1	Implementing algorithms to solve problems using appropriate data structures.
	CO2	Develop Project and learn the different phases of project
	CO3	Implementing algorithms to solve problems using appropriate data structures.
		Groups & Coding Theory
	CO1	Applying the concept of a group action to real life problems such as Counting
	CO2	A student be able to apply their skills and knowledge, that is, translate information presented verbally into mathematical form, select and use appropriate mathematical formulae or techniques in order to process the information and draw the relevant conclusion.
	CO3	A student should be made aware of history of mathematics and hence of its past, present and future role as part of our culture.
		Numerical Techniques
	CO1	This will help you choose, develop and apply the appropriate numerical techniques for your problem, interpret the results, and assess accuracy.
	CO2	The goal is to provide a basic understanding of the derivation, analysis, and use of these numerical methods, along with a rudimentary understanding of finite precision arithmetic and the conditioning and stability of the various problems and methods.
		Mathematics Practical:Python Programming Language-I

CO1	Basic Knowledge of Python Programming Language.
CO2	Problem Solving and programming capability.
CO3	Work with various data format.
	Microcontroller Architecture & Programming
CO1	To write programs for 8051 microcontroller
CO2	To interface I/O peripherals to 8051 microcontroller.
CO3	To design small microcontroller based projects
	Digital Communication and Networking
CO1	Define and explain terminologies of data communication
CO2	Understand the impact and limitations of various digital modulation techniques
CO3	To acknowledge the need of spread spectrum schemes.
CO4	Identify functions of data link layer and network layer while accessing communication link
CO5	To choose appropriate and advanced techniques to build the computer network
	Electronics Practical
CO1	To design and build his/her own microcontroller based projects.
CO2	To acquire skills of Embedded C programming.
CO3	To know multiplexing and modulation techniques useful in developing wireless application.
CO4	Do build and test own network and do settings.
	English
CO1	To introduce the use of English in multimedia
CO2	To acquaint the students with the language skills in multivalent contexts
CO3	To acquaint and enlighten students regarding the speaking skill in various contexts
	SEM-IV
	DATA STRUCTURES AND ALGORITHMS-II
CO1	Implementation of different data structures efficiently
CO2	Usage of well-organized data structures to handle large amount of data
CO3	Usage of appropriate data structures for problem solving
	Computer Networks-I
CO1	Have a good understanding of the OSI and TCP/IP Reference Models and in particular have a good knowledge of Layers.
CO2	2. Understand the working of various protocols.
CO3	3. Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies
	Practical course on CS 241(Data Structures and Algorithms II) and CS 242 (Computer Networks I)

	Connections.
CO3	Understand working principles of short range communication application
CO4	Get introduce to upcoming technology of Internet of Things
CO5	Explore themselves and develop new IoT based applications
	Electronics Practical
CO1	To design and develop own smart applications using Rasberry-Pi
CO2	To write Python program for simple applications
CO3	To build own IoT based system
	English
CO1	To acquaint and familiarize the students with advanced writing skills in different contexts
CO2	To acquaint and familiarize the students with soft skills
CO3	To minimize the gap between the existing communicative skills of the students and the skills
CCO4	they require at professional level

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Course Outcomes – T.Y.B.Sc. (CS) 2020-21

SEM-III(2013-pattern)

	Systems Programming
CO1	To understand the working of linkers and loaders and other development utilities
CO2	To understand Complexity of Operating system as a software.
CO3	To understand concepts of Operating system, advantage and disadvantage of OS
CO4	To understand the design structure of a simple editor.
CO5	To understand the design structure of Assembler and macro processor for an hypothetical Simulated computer..
	Theoretical Computer Science
CO1	To understand the concept of Deterministic Finite Automata and Non Deterministic Finite Automata.
CO2	To have an understanding of finite state and pushdown automata.
CO3	To know the relation between regular language, context free language and corresponding Recognizers.
CO4	To study the Turing machine and classes of problems.
	Computer Networks-I
CO1	Using Computer network understand the different addresses, topologies and basic concepts of computer network
CO2	To study the different kind of protocol
CO3	To Study the Basic concept of Wired LAN
CO4	Understanding of data communication and computer networks.
CO5	To Study the Basic concept of Wired LAN
	Internet Programming -I
CO1	PHP, Server Side Scripting Language Learn PHP Database handling.
CO2	Analyze a web page and identify its elements and attributes.
CO3	Create web pages using XHTML and Cascading Style Sheets
CO4	Build dynamic web pages using JavaScript (Client side programming).
	Programming in Java-I
CO1	Use the Java programming language for various programming technologies (understanding)
CO2	Develop software in the Java programming language, (application).
CO3	To handle abnormal termination of a program using exception handling

CO4	To learn Object Oriented Programming language
CO5	To design User Interface using Swing and AWT

Object Oriented Software Engineering

CO1	To learn and understand various O-O concepts along with their applicability contexts.
CO2	Develop design solutions for problems on various O-O concepts.
CO3	To learn various modeling techniques to model different perspectives of object-oriented software design (UML).
CO4	To learn O-O design solutions for the recurring problems.

SEM-IV

Operating System

CO1	To understand concepts of Operating system, advantage and disadvantage of OS.
CO2	To understand the concepts of Process Management, CPU scheduling algorithms and Process Synchronization.
CO3	To understand the concepts of Deadlocks
CO4	To understand the concepts of Memory Management techniques, Virtual Memory and , page replacement algorithms
CO5	To understand the concepts of Storage Management, Disk Management and disk scheduling

Compiler Construction

CO1	To get the concepts of Compilers.
CO2	To get the concepts of The actual roles of the lexical analyzer
CO3	To understand the concepts of different Parsing techniques and Construction of syntax trees.
CO4	To understand get the concepts of Intermediate code generation, Code optimization and Code generations.

Computer Network-II

CO1	Understand the concepts of layer model ,function and working of each layer
CO2	Understand the different connectivity devices
CO3	Understand the concepts of Cryptography.

Internet Programming-II

CO1	Learn different technologies used at client Side Scripting Language
CO2	Learn XML, CSS and XML parsers.
CO3	One PHP framework for effective design of web application.
CO4	Learn AJAX to make our application more Dynamic.

Practical Based on system programming and operating system

CO1	Demonstrate understanding of Shell programming
CO2	Demonstrate understanding of how to start a new process, replacing a process

	image, duplicating a process image, waiting for a process, zombie process.
CO3	Demonstrate understanding of how to send Signals
CO4	Demonstrate understanding of how to synchronize processes
	Programming in Java-II
CO1	To learn database programming using Java
CO2	Describe Java encapsulation, class creation and creating objects
CO3	Write statements using class static variables and static methods
CO4	To study web development concept using Servlet and JSP
CO5	To learn socket programming concept
	Computer Graphics
CO1	Using these Course students creates its own program using OPENGL.
CO2	Using Computer Graphics student will be able to identify and core concepts of computer graphics
CO3	Using Computer Graphics student will be able to identify and core concepts of computer graphics.
	Practical Based on Programming in Java I & II
CO1	After Completing the course the student will be able to explain and identify concepts of Computer Graphics by creating open GL program including 3D transformation object modeling etc
CO2	Explain the many concepts in Object-oriented programming paradigm
CO3	Understand the history behind the Java technology, its features and strengths
CO4	Understand and explain how Java achieves platform Portability.
CO5	Understand the theory behind many programming structures, constructs, library codes exposed by the Java language
	Practical Based on Internet Programming I , II & Project
CO1	To study the client server architecture an ability to develop a web application using php.
CO2	Determine an appropriate project management approach through an evaluation of the business context and scope of the project
CO3	Identify and describe the key phases of project management
CO4	Practice the role of professional ethics in successful software development.
	Practical Based on system programming and operating system
CO1	Demonstrate understanding of Shell programming.
CO2	Demonstrate understanding of how to start a new process, replacing a process image, duplicating a process image, waiting for a process, zombie process.
CO3	Demonstrate understanding of how to send Signals.
CO4	Demonstrate understanding of how to synchronize processes

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