H.K.E. Society's S.L.N College of Engineering

UG Course Outcomes for 2022-23 Courses	
Department of Computer Science and Engineering	
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**I**
Course Name	**Mathematics – I for CSE Stream**
Course Code	**BMATS101**
Course	**Course Outcome**
CO1	apply the knowledge of calculus to solve problems related to polar curves andlearn the notion of partial differentiation to compute rate of change of multivariate functions
CO2	analyze the solution of linear and nonlinear ordinary differential equations
CO3	get acquainted and to apply modular arithmetic to computer algorithms
CO4	make use of matrix theory for solving the system of linear equations and compute eigenvalues and eigenvectors
CO5	familiarize with modern mathematical tools namely MATHEMATICA/MATLAB/ PYTHON/ SCILAB
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**I**
Course Name	**PHYSICS for CSE STREAM**
Course Code	**BPHYS102**
Course	**Course Outcome**
CO1	Describe the principles of LASERS and Optical fibers and their relevant applications.
CO2	Discuss the basic principles of the Quantum Mechanics and its application in Quantum Computing
CO3	Summarize the essential properties of superconductors and its applications in qubits
CO4	Illustrate the application of physics in design and data analysis.
CO5	Practice working in groups to conduct experiments in physics and perform precise and honest measurements.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**I**
Course Name	**Principles of Programming using C**
Course Code	**BPOPS103**
Course	**Course Outcome**
CO1	Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts.
CO2	Apply programming constructs of C language to solve the real world problem
CO3	Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting
CO4	Explore user-defined data structures like structures, unions and pointers in implementing solutions
CO5	Design and Develop Solutions to problems using modular programming constructs using functions

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**I**
Course Name	**Introduction to Electronics & Communication**
Course Code	**BESCK104C**
Course	**Course Outcome**
CO1	Describe the concepts of electronic circuits encompassing power supplies, amplifiers and oscillators.
CO2	Present the basics of digital logic engineering including data representation, circuits and the microcontroller system with associated sensors and actuators
CO3	Discuss the characteristics and technological advances of embedded systems.
CO4	Relate to the fundamentals of communication engineering spanning from the frequency spectrum to the various circuits involved including antennas
CO5	Explain the different modes of communications from wired to wireless and the computing involved.

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**I**
Course Name	**Introduction to Internet of Things (IOT)**
Course Code	**BETCK105H**
Course	**Course Outcome**
CO1	Describe the evolution of IoT, IoT networking components, and addressing strategies in IoT.
CO2	Classify various sensing devices and actuator types.
CO3	Demonstrate the processing in IoT.
CO4	Explain Associated IOT Technologoes
CO5	Illustrate architecture of IOT Applications

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**I**
Course Name	**Communicative English**
Course Code	**BENGK106**
Course	**Course Outcome**
CO1	Understand and apply the Fundamentals of Communication Skills in their communication skills.
CO2	Identify the nuances of phonetics, intonation and enhance pronunciation skills.
CO3	To impart basic English grammar and essentials of language skills as per present requirement
CO4	Understand and use all types of English vocabulary and language proficiency.
CO5	Adopt the Techniques of Information Transfer through presentation.

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**I**
Course Name	**INNOVATIVE & DESIGN THINKING**
Course Code	**BIDTK158**
Course	**Course Outcome**

CO1	Appreciate various design process procedure
CO2	Generate and develop design ideas through different technique
CO3	Identify the significance of reverse Engineering to Understand products
CO4	Draw technical drawing for design ideas
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**II**
Course Name	**Mathematics – II for CSE Stream**
Course Code	**BMATS201**
Course	**Course Outcome**
CO1	Apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing area and volume.
CO2	Understand the applications of vector calculus refer to solenoidal, and irrotational vectors.Orthogonal curvilinear coordinates
CO3	Demonstrate the idea of Linear dependence and independence of sets in the vector space, and linear transformation
CO4	Apply the knowledge of numerical methods in analysing the discrete data and solving the physical and engineering problems.
CO5	Get familiarize with modern mathematical tools namely MATHEMATICA/ MATLAB /PYTHON/ SCILAB
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**II**
Course Name	**CHEMISTRY FOR CSE STREAM**
Course Code	**BCHES202**
Course	**Course Outcome**
CO1	Identify the terms & applications process involved in scientific and engineering
CO2	Explain the phenomena of chemistry to describe the methods of engineering processes.
CO3	Solvetheproblemsinchemistrythatarepertinentinengineeringapplications
CO4	es
CO5	Analyze properties and multidi processes associated withchemical substances in sciplinary situations.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**II**
Course Name	**Computer Aided Engineering Drawing**
Course Code	**BCEDK103**
Course	**Course Outcome**
CO1	Drawand communicate the objects with definite shape and dimensions
CO2	Recognize andDraw the shape and size of objects through different views
CO3	Develop the lateral surfaces of the object
CO4	Create a Drawing views using CAD software
CO5	Identify the interdisciplinary engineering components or systems through its graphical representation.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**

Semester	**II**
Course Name	**Introduction to Civil Engineering**
Course Code	**BESCK204A**
Course	**Course Outcome**
CO1	Understand the various disciplines of civil engineering
CO2	Understand the infrastructure requirement for sustainable development
CO3	Compute the resultant and equilibrium of force systems.
CO4	Locate the centroid of plane and built-up sections
CO5	Compute the moment of inertia of plane and built-up sections.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**II**
Course Name	**Basics of JAVA programming**
Course Code	**BPLCK205C**
Course	**Course Outcome**
CO1	To explain the features and object oriented concepts in JAVA programming
CO2	To analyse working of bitwise operators in JAVA
CO3	To develop simple programs based on polymorphism and inheritance
CO4	To describe the concepts of importing packages and exception handling mechan
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**II**
Course Name	**Indian Constitution**
Course Code	**BICOK107**
Course	**Course Outcome**
CO1	Analyse the basic structure of Indian Constitution
CO2	Remember their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution.
CO3	know about our Union Government, political structure & codes, procedures.
CO4	Understand our State Executive & Elections system of India.
CO5	Remember the Amendments and Emergency Provisions, other important provisions given by the constitution.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**II**
Course Name	**Scientific Foundations of Health**
Course Code	**BSFHK208**
Course	**Course Outcome**
CO1	To understand and analyse about Health and wellness (and its Beliefs) & It's balance for positive mindset.
CO2	Develop the healthy lifestyles for good health for their better future.
CO3	Build a Healthy and caring relationships to meet the requirements of good/social/positive life.
CO4	To learn about Avoiding risks and harmful habits in their campus and outside the campus for their bright future.
CO5	Prevent and fight against harmful diseases for good health through positive mindset

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**III**
Course Name	**TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES**
Course Code	**21MAT31**
Course	**Course Outcome**
CO1	To solve ordinary differential equations using Laplace transform.
CO2	Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and
CO3	To use Fourier transforms to analyze problems involving continuous-time signals and to applZ-Transform techniques to solve difference equations
CO4	To solve mathematical models represented by initial or boundary value problems involving partial differential equations .
CO5	Determine the extremals of functionals using calculus of variations and solve in dynamics of rigid bodies and vibrational analysis.problems arising
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**III**
Course Name	**DATA STRUCTURES AND APPLICATIONS**
Course Code	**21SC32**
Course	**Course Outcome**
CO1	Identify different data structures and their applications.
CO2	Apply stack and queues in solving problems.
CO3	Demonstrate applications of linked list.
CO4	Explore the applications of trees and graphs to model and solve the real-world problem.
CO5	Make use of Hashing techniques and resolve collisions during mapping of key value pairs
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**III**
Course Name	**ANALOG AND DIGITAL ELECTRONICS**
Course Code	**21CS33**
Course	**Course Outcome**
CO1	Design and analyze application of analog circuits using photo devices, timer IC, power supply and regulator IC and op-amp.
CO2	Explain the basic principles of A/D and D/A conversion circuits and develop the same.
CO3	Simplify digital circuits using Karnaugh Map, and Quine-McClusky Methods
CO4	Explain Gates and flip flops and make us in designing different data processing registers and counters and compare the types. circuits,
CO5	Develop simple HDL programs
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**III**
Course Name	**COMPUTER ORGANIZATION AND ARCHITECTURE**
Course Code	**21CS34**

Course	Course Outcome
CO1	Explain the organization and architecture of computer systems with machine instructions and programs.
CO2	Analyze the input/output devices communicating with computer system
CO3	Demonstrate the functions of different types of memory devices
CO4	Apply different data types on simple arithmetic and logical unit
CO5	Analyze the functions of basic processing unit, Parallel processing and pipelining
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**III**
Course Name	**OBJECT ORIENTED PROGRAMMING WITH JAVA LABORATORY**
Course Code	**21CSL35**
Course	**Course Outcome**
CO1	Use Eclipse/NetBeans IDE to design, develop, debug Java Projects.
CO2	Analyze the necessity for Object Oriented Programming paradigm over structured programming and become familiar with the fundamental concepts
CO3	Demonstrate the ability to design and develop java programs, analyze, and interpret objectoriented and document results.
CO4	Apply the concepts of multiprogramming, exception/event handling, abstraction to develop
CO5	Develop user friendly applications using File I/O and GUI concepts.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**IV**
Course Name	**DESIGN AND ANALYSIS OF ALGORITHMS**
Course Code	**21CS42**
Course	**Course Outcome**
CO1	Analyze the performance of the algorithms, state the efficiency using asymptotic notations and analyze mathematically the complexity of the
CO2	Apply divide and conquer approaches and decrease and conquer approaches in solving the problems analyze the same
CO3	Apply the appropriate algorithmic design technique like greedy method, transform and conquer approaches and compare the efficiency of algorithms to solve the given problem.
CO4	Apply and analyze dynamic programming approaches to solve some problems. and improve an algorithm time efficiency by sacrificing space.
CO5	Apply and analyze backtracking, branch and bound methods and to describe P, NP and NPComplete PROBLEMS
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**IV**
Course Name	**MICROCONTROLLER AND EMBEDDED SYSTEMS**
Course Code	**21CS43**
Course	**Course Outcome**
CO1	Explain C-Compilers and optimization
CO2	Describe the ARM microcontroller's architectural features and program model
CO3	Apply the knowledge gained from programming on ARM to different applications
CO4	Program the basic hardware components and their application selection method

CO5	Demonstrate the need for a real-time operating system for embedded system applications.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**IV**
Course Name	**OPERATING SYSTEMS**
Course Code	**21CS44**
Course	**Course Outcome**
CO1	Identify the structure of an operating system and its scheduling mechanism.
CO2	Demonstrate the allocation of resources for a process using scheduling algorithm
CO3	Identify root causes of deadlock and provide the solution for deadlock elimination
CO4	Explore about the storage structures and learn about the Linux Operating system
CO5	Analyze Storage Structures and Implement Customized Case study
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**IV**
Course Name	**PYTHON PROGRAMMING LABORATORY**
Course Code	**21CSL45**
Course	**Course Outcome**
CO1	Demonstrate proficiency in handling of loops and creation of functions.
CO2	Identify the methods to create and manipulate lists, tuples and dictionaries.
CO3	Discover the commonly used operations involving regular expressions and file system.
CO4	Interpret the concepts of Object-Oriented Programming as used in Python.
CO5	Determine the need for scraping websites and working with PDF, JSON and other file formats.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**V**
Course Name	**Management &entrepreneurship for IT industry**
Course Code	**18CS51**
Course Outcome #	**Course Outcome**
CO1	Define management, organization, entrepreneur, planning, staffing, ERP and outline their importance in entrepreneurship
CO2	Utilize the resources available effectively through ERP
CO3	Make use of IPRs and institutional support in entrepreneurship
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**V**
Course Name	**Computer networks and security**
Course Code	**18CS52**
Course Outcome #	**Course Outcome**
CO1	Explain principles of application layer protocols
CO2	Recognize transport layer services and infer UDP and TCP protocols
CO3	Classify routers, IP and Routing Algorithms in network layer

CO4	Understand the Wireless and Mobile Networks covering IEEE 802.11 Standard
CO5	Describe Multimedia Networking and Network Management
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**V**
Course Name	**Database management system**
Course Code	**18CS53**
Course Outcome #	**Course Outcome**
CO1	Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS.
CO2	Use Structured Query Language (SQL) for database manipulation.
CO3	Design and build simple database systems
CO4	Develop application to interact with databases.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**V**
Course Name	**Automata theory and computability**
Course Code	**18CS54**
Course Outcome #	**Course Outcome**
CO1	Acquire fundamental understanding of the core concepts in automata theory and Theory of Computation
CO2	Learn how to translate between different models of Computation (e.g., Deterministic and Non-deterministic and Software models).
CO3	Design Grammars and Automata (recognizers) for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers.
CO4	Develop skills in formal reasoning and reduction of a problem to a formal model, with an emphasis on semantic precision and conciseness.
CO5	Classify a problem with respect to different models of Computation.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**V**
Course Name	**Application development using python**
Course Code	**18CS55**
Course Outcome #	**Course Outcome**
CO1	Demonstrate proficiency in handling of loops and creation of functions.
CO2	Identify the methods to create and manipulate lists, tuples and dictionaries.
CO3	Discover the commonly used operations involving regular expressions and file system.
CO4	Interpret the concepts of Object-Oriented Programming as used in Python.
CO5	Determine the need for scraping websites and working with CSV, JSON and other file formats

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**V**
Course Name	**Unix programming**
Course Code	**18CS56**
Course Outcome #	**Course Outcome**
CO1	Explain Unix Architecture, File system and use of Basic Commands
CO2	Illustrate Shell Programming and to write Shell Scripts
CO3	Categorize, compare and make use of Unix System Calls
CO4	Build an application/service over a Unix system

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**V**
Course Name	**Computer Network Laboratory**
Course Code	**18CSL57**
Course Outcome #	**Course Outcome**
CO1	Analyze and Compare various networking protocols.
CO2	Demonstrate the working of different concepts of networking.
CO3	Implement, analyze and evaluate networking protocols in NS2 / NS3 and JAVA programming language

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**V**
Course Name	**DBMS Laboratory with mini project**
Course Code	**18CSL58**
Course Outcome #	**Course Outcome**
CO1	Create, Update and query on the database.
CO2	Demonstrate the working of different concepts of DBMS
CO3	Implement, analyze and evaluate the project developed for an application.

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VI**
Course Name	**System Software and Compilers**
Course Code	**18CS61**
Course Outcome #	**Course Outcome**
CO1	Explain system software
CO2	Design and develop lexical analyzers, parsers and code generators
CO3	Utilize lex and yacc tools for implementing different concepts of system software

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VI**

Course Name	**Computer Graphics and Visualization**
Course Code	**18CS62**
Course Outcome #	**Course Outcome**
CO1	Design and implement algorithms for 2D graphics primitives and attributes.
CO2	Illustrate Geometric transformations on both 2D and 3D objects.
CO3	Apply concepts of clipping and visible surface detection in 2D and 3D viewing, and Illumination Models.
CO4	Decide suitable hardware and software for developing graphics packages using OpenGL
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VI**
Course Name	**Web Technology and its applications**
Course Code	**18CS63**
Course Outcome #	**Course Outcome**
CO1	Adapt HTML and CSS syntax and semantics to build web pages.
CO2	Construct and visually format tables and forms using HTML and CSS
CO3	Develop Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to generate and display the contents dynamically
CO4	Appraise the principles of object oriented development using PHP
CO5	Inspect JavaScript frameworks like jQuery and Backbone which facilitates developer to focus on core features.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VI**
Course Name	**Data Mining and Data Warehousing**
Course Code	**18CS641**
Course Outcome #	**Course Outcome**
CO1	Identify data mining problems and implement the data warehouse
CO2	Write association rules for a given data pattern.
CO3	Choose between classification and clustering solution
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VI**
Course Name	**System Software Laboratory**
Course Code	**18CSL66**
Course Outcome #	**Course Outcome**
CO1	Implement and demonstrate Lexer's and Parser's
CO2	Evaluate different algorithms required for management, scheduling, allocation and communication used in operating system
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**

Semester	**VI**
Course Name	**Computer Graphics Laboratory with mini project**
Course Code	**18CSL67**
Course Outcome #	**Course Outcome**
CO1	Apply the concepts of computer graphics
CO2	Implement computer graphics applications using OpenGL
CO3	Animate real world problems using OpenGL
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VI**
Course Name	**Mobile Application Development**
Course Code	**18CSMP68**
Course Outcome #	**Course Outcome**
CO1	Create, test and debug Android application by setting up Android development environment.
CO2	Implement adaptive, responsive user interfaces that work across a wide range of devices.
CO3	Infer long running tasks and background work in Android applications.
CO4	Demonstrate methods in storing, sharing and retrieving data in Android
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VII**
Course Name	**ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING**
Course Code	**18CS71**
Course Outcome #	**Course Outcome**
CO1	Appaise the theory of Artificial intelligence and Machine Learning.
CO2	Illustrate the working of AI and ML Algorithms.
CO3	Demonstrate the applications of AI and ML.
Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VII**
Course Name	**BIG DATA AND ANALYTICS**
Course Code	**18CS72**
Course Outcome #	**Course Outcome**
CO1	Understand fundamentals of Big Data analytics.
CO2	Investigate Hadoop framework and Hadoop Distributed File system.
CO3	Illustrate the concepts of NoSQL using MongoDB and Cassandra for Big Data.
CO4	Demonstrate the MapReduce programming model to process the big data along with Hadoop tools.
CO5	Use Machine Learning algorithms for real world big data.
CO6	Analyze web contents and Social Networks to provide analytics with relevant visualization tools

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VII**
Course Name	**USER INTERFACE DESIGN**
Course Code	**18CS734**
Course Outcome #	**Course Outcome**
CO1	Design the User Interface, design, menu creation, windows creation and connection between menus and windows

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VII**
Course Name	**CRYPTOGRAPHY**
Course Code	**18CS744**
Course Outcome #	**Course Outcome**
CO1	Define cryptography and its principles
CO2	Explain Cryptography algorithms
CO3	Illustrate Public and Private key cryptography
CO4	Explain Key management, distribution and ceritification
CO5	Explain authentication protocolls
CO6	Tell about IPSec

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VIII**
Course Name	**INTERNET OF THINGS**
Course Code	**18CS81**
Course Outcome #	**Course Outcome**
CO1	Interpret the impact and challenges posed by IoT networks leading to new architectural models.
CO2	Compare and contrast the deployment of smart objects and the technologies to connect them to NETWORKS
CO3	Appraise the role of IoT protocols for efficient network communication
CO4	Elaborate the need for Data Analytics and Security in IoT.
CO5	Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry

Table 1: Course Outcomes	
Class	**COMPUTER SCIENCE AND ENGINEERING**
Semester	**VIII**
Course Name	**STORAGE AREA NETWORKS**
Course Code	**18CS822**
Course Outcome #	**Course Outcome**
CO1	Identify key challenges in managing information and analyze different storage networking technologies and virtualization
CO2	Explain components and the implementation of NAS

CO3	Describe CAS architecture and types of archives and forms of virtualization
CO4	Illustrate the storage infrastructure and management activities