DON BOSCO COLLEGE, SULTHAN BATHERY

Affiliated to University of Calicut
(A NAAC accredited & ISO 9001:2015 Certified Institution)
Department Name: Computer Science

Program Outcomes – PG Computer Science

PO 1. **Critical Thinking**: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

PO 2. **Effective Communication**: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.

PO 3. **Social Interaction**: Elicit views of others, mediate disagreements and help reach conclusions in group settings.

PO 4. **Effective Citizenship**: Demonstrate empathetic social concern and equity centered national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

PO 5. **Ethics**: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.

PO 6. **Environment and Sustainability**: Understand the issues of environmental contexts and sustainable development.

PO 7. **Self-directed and Life-long Learning**: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes

Program Specific Outcomes – PG Computer Science

PSO 1. An ability to apply knowledge of computing and mathematics to software development.

PSO 2. An ability to analyze, design and implement computer-based solutions for common requirements.

PSO 3. An ability to use the current techniques, skills and tools for computing practice.

PSO 4. An ability to utilize research knowledge into developing computing solutions.

COURSE OUTCOMES

I Semester

ADVANCED DATA STRUCTURES

Course Outcomes:

By the end of the course the students will be able to:

CO1	Ability to analyze algorithms and algorithm correctness	Analyze
CO2	Ability to summarize searching and sorting techniques	Understand
CO3	Ability to describe stack, queue and linked list operation.	Understand
CO4	The appropriate use of a particular data structure and algorithm to solve a problem.	Analyze
CO5	The ability to estimate big-O timings.	Apply

DISCRETE MATHEMATICAL STRUCTURES

Course Outcomes:

On completing the course the students will be able to gain an understanding of the concepts, related to Discrete Mathematics which helps to understand basic concepts of Computer operations.

CO1	Write an argument using logical notation and determine if the argument is or is not valid.	Remembering
CO2	Manipulate basic mathematical objects such as sets, functions, and relations and will also be able to verify simple mathematical properties that these objects possess	Applying
CO3	Develop understanding of Logic Sets and Functions	Creating
CO4	Demonstrate an understanding of relations and functions and be able to determine their properties.	Applying
CO5	Develop an understanding of how graph and tree concepts are used to solve problems arising in the computer science.	Creating

THEORY OF COMPUTATION

Course Outcomes:

SL .NO	Learning Outcomes	Level
CO1	Master regular languages and finite automata	**Understanding**
CO2	Be familiar with Regular grammar	**Understanding**
CO3	Master in CFL,CSL	**Comprehension**
CO4	Master context-free languages, push-down automata, and Turing recognizable languages	**Understanding**
CO5	Learn computational complexity	creating

THE ART OF PROGRAMMING METHODOLOGY

Course Outcomes:

On completing the course the students will be able to handle errors, solving problems, and building application using C.

CO1	**Describe** and employ strategies that are useful in debugging.	**Recall**
CO2	**Explain** the use different data types, such as simple variables, arrays, and structures.	**Examine**
CO3	**Use** algorithms to solve simple programming problems.	**Apply**
CO4	**Analyze** programming problems to choose when regular loops should be used and when recursion will produce a better program.	**Analyze**
CO5	**Evaluate** the programming concepts that use calculations and selections, loops and arrays, functions, arrays for character strings and that use pointers for character strings.	**Evaluate**
CO6	**Design** and plan the logic of a Program.	**Create**

COMPUTER ORGANIZATION AND ARCHITECTURE

Course Outcomes:

On completing the course the students will be able to:

CO1	Design simple logic circuits using logic gates.	Create
CO2	Compare combinational and sequential logic circuits	Analyse

CO3	Distinguish the organization of various functional units of a computer.	Analyse
CO4	Interpret the functional architecture of computing systems.	Apply
CO5	Explain the micro operations taking place in computer operation.	Understand

II Semester

DESIGN AND ANALYSIS OF ALGORITHM

Course Outcomes:

On completing the course the students will be able to:

CO1	Design simple logic circuits using logic gates.	Create
CO2	Compare combinational and sequential logic circuits	Analyse
CO3	Distinguish the organization of various functional units of a computer.	Analyse
CO4	Interpret the functional architecture of computing systems.	Apply
CO5	Explain the micro operations taking place in computer operation.	Understand

PRINCIPLES OF SOFTWARE ENGINEERING

Course Outcomes:

On completing the course the students will be able to:

CO1	How to apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment	Apply
CO2	An ability to work in one or more significant application domains	Analyse
CO3	Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle.	Apply
CO4	Demonstrate an ability to use the techniques and tools necessary for engineering practice.	Apply
CO5	To learn application of various CASE tools in SE	Apply

OPERATING SYSTEM CONCEPTS

Course Outcomes:

On completing the course the students will be able to gain an understanding of the concepts, related to Operating Systems which help to possess a career in IT field.

CO1	Explain the important computer system resources and the role of operating system in their-management policies.	Understand

CO2	Evaluate the requirement for process synchronization and coordination handled by operating system	Evaluate
CO3	Experiment with the high-level structure of the Linux kernel both in concept and source code.	Apply
CO4	Analyze the memory management and its-allocation policies.	Analyze
CO5	Identify use and evaluate the storage management policies with respect to different storage management-Technologies	Apply

COMPUTER NETWORKS

Course Outcomes:

On completing the course the students will be able to gain an understanding of the concepts, related to Data Communication and networking which helps to possess a career in Networking field.

CO1	Describe various technologies used for data communication	Remembering
CO2	Identify possible errors in data transfer and solutions for them	Remembering
CO3	Describe the various protocols used in data communication	Remembering
CO4	Classify the routing protocols and analyze how to assign the IP addresses for the given network	Apply
CO5	Identify security issues in networks and available protection mechanisms	Remembering

COMPUTATIONAL INTELLIGENCE

Course Outcomes:

On completing the course the students will be able to:

CO1	Compare AI with human intelligence and traditional information processing and discuss its strengths and limitations as well as its application to complex and human-centered problems.	Analyze
CO2	Use the basic principles, models, and algorithms of AI to recognize, model, and solve problems in the analysis and design of information systems.	Apply
CO3	Examine the structures and algorithms of a selection of techniques related to searching, reasoning, machine learning, and language processing.	Analyze
CO4	Review research articles from well-known AI journals and	Analyze

	conference proceedings regarding the theories and applications of AI.	
CO5	Carry out a research project and write a research proposal, report and paper.	Create

III Semester

ADVANCED DATABASE MANAGEMENT SYSTEM

Course Outcomes:

On completing the course the students will be able to gain an understanding of the concepts, related to OOP which helps them to develop java applications.

CO1	describe relational algebra expression, tuple and domain relation expression from queries.	Remembering
CO2	Explain the use of normalization and functional dependency, indexing and hashing technique used in database design and recognize/ identify the purpose of query processing and optimization and also demonstrate the basic of query evaluation.	Understanding
CO3	apply relational database theory	Applying
CO4	identify the basic concepts and various data model used in database design, ER modelling concepts and architecture use and design queries using SQL	Analyzing
CO5	Recommend Object Oriented Database and Distributed databases	Evaluating
CO6	**invent** an information model into a relational database schema and to use a data definition language and/or utilities to implement the schema using a DBMS.	Creating

OBJECT ORIENTED PROGRAMMING CONCEPTS

Course Outcomes:

On completing the course, the students will be able to gain an understanding of the concepts, related to advanced java concept which helps to increase the knowledge about advanced java servlet.

CO1	knowledge of the structure and model of the Java programming language, (knowledge)	Knowledge
CO2	use the Java programming language for various programming technologies (understanding)	Understand
CO3	Develop software in the Java programming language, (application)	Application

CO4	Evaluate user requirements for software functionality required to decide whether the Java programming language can meet user requirements (analysis)	Analysis
CO5	Propose the use of certain technologies by implementing them in the Java programming language to solve the given problem (synthesis)	Synthesis

PRINCIPLES OF COMPILERS

On completing the course, the students will be able to:

SL .NO	Learning Outcomes	Level
CO1	Analyze the phases of compiler, design and implement a Lexical analyzer.	**analysis**
CO2	Design and implement a parser	**analysis**
CO3	Characterize about intermediate code generation and type checking	**Comprehension**
CO4	Know about storage allocation	**Understanding**
CO5	Learn to optimize and design a code generator	creating

WEB TECHNOLOGY

Course Outcomes:

On completing the course, the students will be able to gain an understanding of the concepts, the skills and project-based experience needed for entry into web application and development careers.

CO1	Students are able to develop a dynamic webpage by the use of java script and DHTML.	Create
CO2	Integrate java and server side scripting languages to develop web applications.	Understand
CO3	To develop and deploy real time web applications in web servers and in the cloud.	Application
CO4	Analyze to Use appropriate client-side or Server-side applications)	Analysis

CRYPTOGRAPHY AND NETWORK SECURITY

Completion of this course will enable the students to:

SL NO	Learning Outcomes	Level
CO1	Describe network security services and mechanisms.	**Understand**
CO2	Explain the Public-Key Infrastructure	**Understand**
CO3	Be able to digitally sign emails and files	**Create**
CO4	Be able to configure simple firewall architectures	**Create**
CO5	Describe Virtual Private Networks	**Understand**

IV Semester

ADVANCED JAVA PROGRAMMING

Course Outcomes:

On completing the course, the students will be able to gain an understanding of the concepts, related to advanced java concept which helps to increase the knowledge about advanced java servlet

SL NO	Learning Outcomes	Level
CO1	To understand the concept and model of Servlet	Knowledge
CO2	Students will develop sophisticated, interactive user interfaces using the Java Swing class and appropriate layout managers	Understand
CO3	To study the different JSP libraries	Application
CO4	Develop various operation in JDBC	Analysis
CO5	Hibernate and mapping classes details	Synthesis

SYSTEM SECURITY

Course Outcomes:

On completing the course the students will be able to gain an understanding of the concepts, related to Operating Systems and Computer security which help to possess a career in IT field.

SL NO	Learning Outcomes	Level
CO1	Distinguish between various types of attacks on computing resources.	Understand
CO2	Identify various attacks on computer programs and propose solutions for the same.	Apply
CO3	Identify the OS functions and the possible attacks on them, with proposed solutions.	Apply
CO4	Describe the importance of securing database.	Understand

CO5	Develop security policies at various levels.	Create