BHARATI VIDYAPEETH'S
COLLEGE OF ENGINEERING, KOLHAPUR

Name of Department   Computer Science and Engineering
Class:-Second Year   Sem:-III
Course: - Applied Mathematics (BSC-CS301)

Course Outcomes:
Upon successful completion of this course, the student will be able to:

1. Describe the statistical data numerically by using Lines of regression and Curve Fittings.
2. Solve basic problems in probability theory, including problems involving the binomial Poisson, and normal distributions.
3. Calculate numerical Integration.
4. Define fuzzy sets using linguistic words and represent these sets by membership functions, convexity,Normality, support etc.
5. Solve examples on the principle in performing fuzzy number arithmetic operations such as Addition,Multiplication & fuzzy equation.
6. Solve assignment problems by using techniques of operation research.

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Name of Department   COMPUTER SCIENCE AND ENGINEERING
Class:-Second Year B.TECH   Sem:-III
Course: -Discrete Mathematics & Structures (PCC-CS302)

Course Outcomes:
Upon successful completion of this course, the student will be able to –
1. Apply logic concepts in designing a program.

2. Illustrate basic set concepts & apply operations on set.

3. Minimize the Boolean Function.

4. Apply basic concepts of probability to solve real world problem.

5. Represent data structures using graph concepts.

6. Design abstract machine, detect deadlocks.

Name of Department Computer Science and Engineering

Class:-Second Year BTECH   Sem:-III

Course: - Data Structures (PCC-CS303)

Course Outcomes:

Upon successful completion of this course, the student will be able to –

1. Identify the appropriate data structure for specific application.

2. Design and analyze programming problem statements.

3. Chose appropriate sorting and searching algorithms.

4. Outline the solution to the given software problem with appropriate data structure.

Name of Department Computer Science and Engineering

Class:-Second Year BTECH   Sem:-III

Course: - Computer Networks – I (PCC-CS304)

Course Outcomes:

Upon successful completion of this course, the student will be able to –

1. Demonstrate concepts of Computer Networks.

2. Explain OSI and TCP/IP layer architecture

3. Implement network and data link layer.

4. Demonstrate TCP protocol in detail.

5. To analyze the protocol structure using network analyzing tools.

6. Apply the principals of socket programming in the networks.

Name of Department   COMPUTER SCIENCE AND ENGINEERING

Class:-Second Year BTECH   Sem:-III

Course: - Microprocessors (PCC-CS305)

Course Outcomes:

Upon successful completion of this course, the student will be able to –

1. Describe the Architecture of 8085 microprocessors and microcontroller

2. Classify the 8086 Assembly Instructions set and use in Assembly language Programs

3. Explain Programming model's of 8086microprocessors

4. Classify the 8086 Assembly Instructions set and use in Assembly language Programs

5. Understand the higher processor architecture

6. Understand the need for other Microprocessors

Name of Department Computer Science and Engineering
Class:-Second Year BTECH   Sem:-III
Course: - C Programming (PCC-CS306)

Course Outcomes:
Upon successful completion of this course, the student will be able to –
1. Articulate the principles of procedure oriented problem solving and programming.

2. Explain programming fundamentals including statements, control flow and recursion

3. Able to formulate problems and implement algorithms in C

4. Analyze and use data structures to solve the complex problem statements.

5. Demonstrate file operations using file handling concepts through developing applications.

Name of Department Computer Science and Engineering
Class:-Second Year BTECH   Sem:-III
Course: - SOFT SKILLS (HM-CS307)

Course Outcomes:
Upon successful completion of this course, the student will be able to –

1. Effectively communicate through verbal/oral communication and improve the listening skills

2. Actively participate in group discussion / meetings / interviews and prepare &
   deliver presentations.

3. Function effectively in multi-disciplinary and heterogeneous teams through the knowledge
   of team work, Inter-personal relationships, conflict management and leadership quality.

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Name of Department Computer Science and Engineering

Class:-Second Year   Sem:- IV
Course: - Automata Theory (PCC-CS-401)

Course Outcomes:
Upon successful completion of this course, the student will be able to –

1. Understand basic concepts of Regular Language and Regular Expressions

2. Select appropriate abstract machine to recognize a given formal language.

3. Generate complex languages by applying Union, Intersection, Complement Concatenation Kleene *

operations on simple languages.

4. Apply parsing concepts for syntax analysis.

5. Be familiar with thinking analytically and intuitively for problem solving situations

6. Areas of theory in computer science.

Name of   Department Computer Science and Engineering

Class:-Second Year BTECH   Sem:- IV

Course: - Computer Networks-II (PCC-CS-402)

Course Outcomes:
Upon successful completion of this course, the student will be able to –

1. program the client server model using sockets

2. understand and apply next generation protocol and addressing model

3. Elaborate the fundamentals of Domain Name Systems

4. apply the concepts of Remote login and FTP in network applications

5. Learn fundamentals of web, HTTP and e-mail communication protocols.

6. Understand multimedia streaming and relevant protocols.

Name of Department Computer Science and Engineering

Class:-Second Year BTECH   Sem:- IV

Course:- Computer Organization and Architecture (PCC-CS-403)

Course Outcomes:
Upon successful completion of this course, the student will be able to –

1. Recapitulate the history of computer system and the basic concepts of computer architecture andorganization.

2. Understand the concept of I/O Organization.

3. Apply the different algorithms to perform arithmetic operations.

4. Articulate the design issues in the development of processor.

5. Conceptualize instruction level parallelism.

6. Understand the concept of memory techniques.

Name of   Department Computer Science and Engineering

Class:-Second Year BTECH   **Sem:- IV**

Course:- Operating System I (PCC-CS-404)

Course
Objectives:

1. To make the students understand basic concepts of operating system

2. To expose the students to various functions of the Operating system and their usage

3. To give hands on exposure to Linux commands and system calls.

Name of Department   COMPUTER SCIENCE AND ENGINEERING
Class:-Second Year BTECH   Sem:- IV
Course: - Software Engineering (PCC-CS-405)

Course Outcomes:
Upon successful completion of this course, the student will be able to –

1. Comprehend systematic methodologies of SDLC (Software Development Life Cycle)

2. Discriminate competing and feasible system requirements indicating correct real world problem scope and prepare stepwise system conceptual model using stakeholder analysis and requirement validation.

3. Prepare SRS document for a project

4. Apply software design and development techniques

5. Develop a quality software project through effective team-building, planning, scheduling and risk

6. Understand testing methods at each phase of SDLC. To tackle real world problems in domain of data mining, information retrieval, computer vision, linguistics and bioinformatics, etc .retrieval, computer vision, linguisticsand bioinformatics, etc.

Name of Department Computer Science and Engineering

Cass:-Second Year BTECH   Sem:-IV

Course:- Object Oriented Programming (PCC-CS406)

Course Outcomes:

After the completion of this course, a successful student will be able to do the following:

1) Use the characteristics of an object-oriented programming language in a program.

2) Use the basic object-oriented design principles in computer problem solving.

3) Use the basic principles of software engineering in managing complex software project.

4) Program with advanced features of the C++ programming language.

5) Develop programs in the LINUX programming environment.

6) Basic principles of software engineering in managing

Name of Department Computer Science and Engineering

Class:-Second Year BTECH   Sem:-IV

Course:- Mini Project (PW-CS407)

Course Outcomes:

1. Define the problem statement.

2. Organize, Plan and prepare the detailed project activities.

3. Construct Flowchart, System Architecture based on the project description

4. Implement the solution for their problem.

5. Understand testing methods at each phase of SDLC

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Name of   Department Computer Science and Engineering

Class:-Second Year BTECH   Sem:-IV

Course:- Mini Project (PW-CS407)

1 Get acquainted with the scope and multidisciplinary nature of environmental science with the overall

   Aim of sustainable development.

2 Understand the importance of ecosystems in the view of its conservation

3 Know the values of natural resources with associated problems for sustainable lifestyles

4 Familiarize the basics of Biodiversity and concerned issues in the context of Western Ghats

5 Make aware of the pollution issues with its mitigation measures

6 Understand the social issues accompanied by environmental issues in the light of role of Indian culture and movements   in conservation of the environment

7 Recognize the significance of policies and legislation in environmental protection.

8 Acquire problem solving attitude through actual experiential learning in the form of

Name of Department Computer Science and Engineering

Class:-Third Year BTech   Sem:- V

Course:- Information Security (PCC - CS501)

Course Outcomes:

Upon successful completion of this course, the students will be able to -

1. Understand principles of Crypto-systems.

2. Compare and analyze various security services and mechanisms.

3. Apply and use the features of PGP, S/MIME, DSA, IPSec, SSL in their profession.

4. Takeprecautionsoftheirpersonalcomputingsystemfrompossiblethreatsand attacks.

5. Explore newer vulnerabilities and provide the solutions to them.

6. Various security services and mechanisms

Name of Department Computer Science and Engineering

Class:-Third Year Btech   **Sem:- V**

Course:- System Programming (PCC - CS502)

Course Outcomes:

1. Student will be able to identify the role of system programs and application programs.

2. Student will be able to understand the basics of system programs like

editors,compiler, assembler , linker,loader, interpreter and debugger.

3. Students able to describe the various concepts of assemblers and macro -processors.

4. Students able to understand the various phases of compiler and compare its working with assembler.

5. Students understand how linker and loader create an executable program from an object

module created byassembler and compiler.

6. Student will be able to create graphical user interfaces for basic programs

and learn aboutterminal input/output through the term ios libraries.

Name of Department Computer Science and Engineering

Class:- Third Year Btech

Course:- Object Oriented Modeling and Design (PCC –CS503)   Sem -V

Course Outcomes

1. Ability to analyze and model software systems

2. Ability to construct OO view of the system

3. Ability to design a Software System using OMT design techniques.

4. Ability to design a Software System using UML design techniques.

Name of   Department Computer Science and Engineering

Class:- Third Year Btech

Course Name: Computer Algorithms PCC - CS504   Sem:-V

Course Outcomes:

1 Understand and demonstrate algorithm design methods with
Analysis.

2 Devise algorithm for given problem statement and analyze its space and time complexity by using recurrence relation.

3 Categorize the problem to determine polynomial and non-polynomial based on its
nature

4 Understand and demonstrate basic concepts of parallel algorithms

Name of   Department Computer Science and Engineering

Class:- Third Year Btech   Sem:-V

Course Name: Computer Graphics and Multimedia (Oec - Cs505)

Course Outcomes:

1 Express basic ideas of computer graphics and different display devices.

2. Understand & apply various transformation, projection and rendering techniques on graphical

   Objects.

3.Identify & apply the intensity of light on graphical objects using different illumination models.

4. Understand multimedia system & use of Multimedia Authoring & Compression techniques on

Graphical objects

Name of   Department Computer Science and Engineering
Class:- Third Year Btech
Sem:-V
Course:- Java Programming (PCC - CS507)

Course Outcomes
1. Students will be able to articulate the principle of object-oriented problem solving&
   programming.
2. Students will be able to illustrate code reusability, security and abstraction using
inheritance, package andinterface.
3. Students will be able to develop reliable and user-friendly applications using exception
handling and filehandling.
4. Students will be able to create desktop apps using SWING and event handling
and also illustratemultithreading concepts.
5. Students will be able to use JDBC & collection framework.
6. Studentswillbeabletoapplynetworkprogrammingconcept&developwebapplications
   using servlet and jsp.

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Name of Department Computer Science and Engineering

Class: Third Year Btech   SEM:V

Course: Business English (HM - CS508)

Course Outcomes (COs)

1. Learn to communicate with others in practical, business oriented situations

2. Learn to express themselves in English with greater fluency, accuracy and confidence

3. Learn to handle themselves in English in a variety of business contexts, from negotiating, tousing thetelephone, to making presentations, to socializing

4. Enhance the skills of listening, speaking, pronunciation skills, as well as business vocabulary

5. Acquire the communicative competencies crucial for appropriate work place behavior

Name of Department Computer Science and Engineering
Class:- Third Year B Tech   Sem:-VI
Course:- Compiler Construction (PCC - CS601)

Course Outcomes
1. Recall the compiler phases and compiler construction tools like LEX and YACC.

2. To design and implement Lexical Analyzer for a simple language.

3. To design and implement Syntax analyzer for a simple expression.

4. To apply Syntax directed translations and Syntax Directed definitions to generate intermediate code.

5. To identify appropriate code optimizing transformation for the given code.

6. To explain concept of code generation.

Name of Department Computer Science and Engineering

Class:- Third Year Btech   Sem:-VI

Course:- Operating System -II (PCC - CS602)

Course Outcomes
Upon Completion of this course, students will be able to-

1. To understand UNIX kernel, its architectural components like file sub system, process control subsystem,memory management.

2. To understand a concrete way (UNIX i-nodes) of organizing a file system on a physical storage medium.

3. To maintain UNIX directories, files, manage processes, manipulate data with proper use of pipes and fileredirection, UNIX filters.

4. To implement and handle various UNIX system calls.

5. To explain the principles of paging, virtual memory (VM) and describe the data structures and components (both hardware and software) that are necessary to implement it.

6. To perform shell programming involving decision control, looping and control flow statements on UNIX based machines.

Name of   Department Computer Science and Engineering

Class:- Third Year Btech   Sem:-VI

Course:- Database Engineering (PCC - CS603)

Course Outcomes

1. Understand fundamentals of database management systems.

2. Represent logical design of database using E-R Diagram.

3. Analyze & construct good database design.

4. Apply SQL queries to design & manage the database.

Name of   Department Computer Science and Engineering

Class:-Third Year Btech   **Sem:- VI**

Course:- Machine Learning (PCC - CS604)

Course Outcomes
On completion of the course, student will be able to
1. Explain Machine Learning concepts.

2. Analyze the Machine Learning model.

3. Design solution using Machine Learning techniques.

4. To tackle real world problems in domain of data mining, information retrieval,

computer vision , linguistics and bio informatics ,etc..

Name of Department   Computer Science and Engineering

Class:-Third Year Btech   **Sem:- VI**

Course: Cyber Security (OEC - CS606)

Course Outcomes

On completion of the course, student will be able to-

1. Explain the cyber security concepts.

2. Describe the cyber security vulnerabilities and prevention techniques.

3. Explain the different rules and regulations under I.T.ACT.

4. Explain the concepts of digital forensics & incident management tools.

Name of Department   COMPUTER SCIENCE AND ENGINEERING

Class:-Third Year Btech   **Sem:- VI**
Course: C# Programming (PCC - CS607)

Course Outcomes
On completion of the course, student will be able to-

1. Students will be able to develop correct, well-documented programs using the C# programming language.

2. Students will be able to learn to develop object-oriented programs using C# classes and objects

3. Students will be able to learn to use Windows Forms and WPF to create GUI-based programs

4. Students will be able to build networking and multithreading based programs using C#

5. Students will be able to design web applications using ASP.NETusingASP.NET controls in web applications.

6. Students will be able to debug and deploy ASP.NET web applications and create data base

driven ASP.NETweb applications.

Name of Department   COMPUTER SCIENCE AND ENGINEERING

Class:-Third Year Btech   **Sem:- VI**
Course: Domain Specific Mini-project (PW - CS608)

Course Outcomes
On completion of the course, student will be able to-

 Upon successful completion of this course, the student will be able to –

 1. Identify specific problem statement from a selected domain.

 2. Analyze the problem and prepare SRS and design document.

 3. Write code and carry out testing.

 4. Write a report covering details of the project and give presentation on a project.

Name of Department   COMPUTER SCIENCE AND ENGINEERING

Class:-Final Year Btech   Sem:- VII

Course: - Advanced Computer Architecture (PCC-CS701)

Course Outcomes:
Upon successful completion of this course, the students will be able to:

1. Demonstrate concepts of parallelism in hardware/software.

2. Discuss memory organization and mapping techniques.

3. Describe architectural features of advanced processors.

4. Interpret performance of different pipelined processors.

5. Explain data flow in arithmetic algorithms.

6. Development of software to solve computationally intensive problems.

Name of Department   COMPUTER SCIENCE AND ENGINEERING

Class:-FINAL YEAR BTECH   Sem:- VII

Course: - Cloud Computing (PCC – CS702)

Course Outcomes:

Upon successful completion of this course, the students will be able to:

1. Describe the main concepts, key technologies, strengths, and limitations of cloud
   computing and thePossible applications for state-of-the-art cloud computing.

2. Explain the architecture and infrastructure of cloud computing, including SaaS, PaaS,
   IaaS ,public cloud,private cloud, hybrid cloud, etc.

3. Collaboratively research on the state of the art (and open problems) in cloud computing.

4. Identify problems, and explain, analyze, and evaluate various cloud computing solutions.

5. Choose the appropriate technologies, algorithms, and approaches for the related issues.

6. Display new ideas and innovations in cloud computing.

Name of Department Computer Science and Engineering

Class:-Final Year Btech   Sem:- VII

Course: -Web Technologies (PCC- CS705)

Course Outcomes:

Upon successful completion of this course, the students will be able to-

1. Implement different types of tags in HTML, CSS, client side scripting

2. Design an application to process Web forms using Java script

3. Design web application using MVC and Angular JS

4. Demonstrate use of server side technologies using PHP

5. Design and implement database applications using PHP

6. Explore newer tools for web development

Name of Department Computer Science and Engineering

Class:-Final Year Btech   Sem:- VII /VIII

Course: - Project-I (PW- CS706)

Course Outcomes:
Upon successful completion of this course, the students will be able to-

1. Explain the need of a software project for the society

2. Identify requirement analysis like functional and technical requirements for the project

3. ComeupwithdesigndocumentsfortheprojectconsistingofArchitecture,Dataflowdiagram, class Diagram,

Algorithmicdescriptions of various modules, collaboration diagram, ER Diagrams, Database

Design Documents, Sequence Diagram, Use Case Diagram

4. Able to demonstrate analysis and design.

5. Prepare the technical report consisting of Requirements specification,

6. Analysis and Design of project

Name Of Department   Computer Science and Engineering

Class:- FINAL YEAR BTECH   Sem:-VIII

Course: - Deep Learning (PCC - CS802)

Upon successful completion of this course, the students will be able to :

1. Describe basic concepts of artificial intelligence and
2. Deep learning.
3. Develop different deep learning models for given tasks.
4. Devise the correct parameters and hyper-
5. parameters of developed model forgetting
6. Improved results.

Name Of Department   Computer Science and Engineering

Class:- FINAL YEAR BTECH   Sem:-VIII

Course: - Ad-Hoc Wireless Sensor Networks (PCE- CS803)

1) Describe issues and design goals in Ad Hoc wireless networks

2) Explain and classify various routing protocols in Ad Hoc wireless networks

3) Describe design issues and classify transport layer protocols and security protocols in
   Ad Hoc wirelessNetworks

4) Describe challenges and routing protocols in sensor networks

5) Explain sensor networks infrastructure management and sensor tasking and control techniques

Name Of Department   Computer Science and Engineering

Class:- FINAL YEAR BTECH   Sem:-VIII

<u>Course: - Block chain Technology</u> (PCE- CS804)

Upon successful completion of this course, the students will be able to :
1. Explain design principles of Bitcoin and Ethereum.

2. Explain Nakamoto consensus.

3. Explain the Simplified Payment Verification protocol.

4. List and describe differences between proof-of-work and proof-of-stake consensus.

5. Interact with a blockchain system by sending and reading transactions.

6. Design, build, and deploy a distributed application..

Name Of Department   Computer Science and Engineering

Class:- Final Year Btech   Sem:-VIII

Course: -Mobile application development (PCC- CS805)

Course Outcomes
Upon successful completion of this course, the students will be able to:

7. To Install and configure Android application development tools.

8. To Design and develop user Interfaces for the Android platform.

9. To Design and develop database based android application.

10. To Apply Java programming concepts to Android app development

Name Of Department   Computer Science and Engineering

Class:- Final Year Btech   Sem:-VIII

Course: - 1. Big Data Analytics (PCC - CS801)

Upon successful completion of this course, the students will be able to –

1. Analyze several key technologies used in manipulating, storing, and analyzing big data.

2. Acquire clear understanding of R & Hadoop.

3. Acquire clear understanding of Integrating R & Hadoop and Acquire clear understanding of Hadoop Streaming and its importance.

4. Manage Big Data and analyze Big Data.

5. Apply tools and techniques to analyze Big Data.

Name Of Department   Computer Science and Engineering

Class:- Final Year Btech   Sem:-VIII
Course: - Artificial Intelligence (Elective-I)

Course Outcomes:
Upon successful completion of this course, the students will be able to :

1. Evaluate Artificial Intelligence (AI) methods and describe their foundations..

2. Apply basic principles of AI in solutions that require problem solving, inference,

3. Demonstrate knowledge of reasoning and knowledge representation for solving real world problems

4. Analyze and illustrate how search algorithms play vital role in problem solving.

5. Illustrate the construction of learning and expert system.

6. Discuss current scope and limitations of AI and societal implications.

Name Of Department   Computer Science and Engineering

Class:- Final Year Btech   Sem:-VIII

Course: - Project-II (PW- CS806)

Course Outcomes

Upon successful completion of this course, the students will be able to –

1. Design and develop usable User Interface

2. Analyze and apply emerging technologies in development of a project

3. Test the modules in Project

4. Demonstrate working of project