**BHARATHIYAR INSTITUTE OF ENGINNERING FOR WOMEN**

**DEVIYAKURICHI, SALEM DT-636112**

**DEPARTMENT OF CSE**

**REGULATION 2021**

**COURSE OUTCOMES & CO-PO MAPPINGS**

**SEMESTER-I**

**SUBJECT CODE &NAME: HS3151 & PROFESSIONAL ENGLISH – I**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C101.1 | Listen, Comprehend and Correspond with others at various contexts |
| C101.2 | Speak legibly and fluently under various life-time situations by applying proper communication modules |
| C101.3 | Read and understand a variety of writings and technical text by analyzing the meaning and language |
| C101.4 | Apply clear and legible writing skills in error free style in coherent manner |
| C101.5 | Remember and use various communicative skills in precise and efficient way on technological contexts |
| C101.6 | Form situational conversations and technical writing styles for interpersonal and effective communication |

**CO–PO-PSO MAPPING:**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C101.1 | - | - | - | - | - | - | - | - | 3 | 3 | - | 2 | - | - |
| C101.2 | - | - | - | - | - | - | - | - | 3 | 3 | - | 2 | - | - |
| C101.3 | - | - | - | - | - | - | - | - | 2 | 3 | - | 2 | - | - |
| C101.4 | - | - | - | - | - | - | - | - | 2 | 3 | - | 2 | - | - |
| C101.5 | - | - | - | - | - | - | - | - | 3 | 3 | - | 2 | - | - |
| C101.6 | - | - | - | - | - | - | - | - | 3 | 3 | - | 2 | - | - |
| **C101** | - | - | - | - | - | - | - | - | 3 | 3 | - | 2 | - | - |

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**SUBJECT CODE &NAME: MA3151 & MATRICES AND CALCULUS – I**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C102.1 | Determine the Eigen values, Eigen vectors to diagonalize a matrix and reduce quadratic form to canonical form. |
| C102.2 | Apply the concept of limits, continuity, rules of differentiation, techniques of differentiation to differentiate standard functions. |
| C102.3 | Apply the concepts of Concavity, Convexity to determine the critical points, point of Inflection, Maxima and Minima of Single variable functions. |
| C102.4 | Compute the derivatives of functions of two variables and apply them to calculate the maxima and minima. |
| C102.5 | Determine integrals using techniques of integration, such as substitution, partial fractions and integration by parts. |
| C102.6 | Apply various techniques to solve higher order differential equations with constant and variable Coefficients |

**CO – PO-PSO MAPPING:**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C102.1 | 3 | 2 | 1 | - | - | - | - | 1 | 1 | - | - | - | 2 | - |
| C102.2 | 3 | 2 | 1 | - | - | - | - | 1 | 1 | - | - | - | 2 | - |
| C102.3 | 3 | 2 | 1 | - | - | - | - | 1 | 1 | - | - | - | 2 | - |
| C102.4 | 3 | 2 | 1 | - | - | - | - | 1 | 1 | - | - | - | 2 | - |
| C102.5 | 3 | 2 | 1 | - | - | - | - | 1 | 1 | - | - | - | 2 | - |
| C102.6 | 3 | 2 | 1 | - | - | - | - | 1 | 1 | - | - | - | 2 | - |
| **C102** | 3 | 2 | 1 | - | - | - | - | 1 | 1 | - | - | - | 2 | - |

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**SUBJECT CODE &NAME: PH3151 & ENGINEERING PHYSICS**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C103.1 | Demonstrate the properties of elasticity and measure the different moduli of elasticity |
| C103.2 | Discuss the characteristics of laser and optical fiber |
| C103.3 | Explain the concepts of ultrasonics in engineering |
| C103.4 | Explain black body radiation, properties of matter waves and Schrodinger equation |
| C103.5 | Classify the Bravais lattices and different types of crystal structures |
| C103.6 | Summarize the information on growth of crystals and deformations |

**CO–PO-PSO MAPPING:**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C103.1 | 3 | 2 | 1 | - | - | - | - | - | - | - | - | - | 1 | - |
| C103.2 | 2 | 1 | - | - | - | - | - | 1 | 1 | 1 | - | - | 1 | - |
| C103.3 | 2 | 1 | - | - | - | - | - | 1 | 1 | 1 | - | - | 1 | - |
| C103.4 | 2 | 1 | - | - | - | - | - | 1 | 1 | 1 | - | - | 1 | - |
| C103.5 | 3 | 2 | 1 | - | - | - | - | - | - | - | - | - | 1 | - |
| C103.6 | 2 | 1 | - | - | - | - | - | 1 | 1 | 1 | - | - | 1 | - |
| **C103** | 2 | 1 | 1 | - | - | - | - | 1 | 1 | 1 | - | - | 1 | - |

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**SUBJECT CODE & NAME: CY3151 & ENGINEERING CHEMISTRY**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C104.1 | Determine the hardness of water and explain the water treatment methods. |
| C104.2 | Define nanochemistry and its types and process of synthesizing nano particles |
| C104.3 | Describe the phase diagram of one component and two component system and various methods of heat treatment of steel. |
| C104.4 | Classify the various types of fuels by their characteristics and explain the flue gas analysis by Orsat method. |
| C104.5 | Illustrate the working of Lead acid battery, lithium ion battery and fuel cell. |
| C104.6 | Apply Nernst equation to determine the EMF of the cell and explain various corrosion control methods. |

**CO–PO-PSO MAPPING:**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C104.1 | 2 | 1 | - | - | - | 1 | 1 | - | - | - | - | - | - | - |
| C104.2 | 2 | 1 | 1 | - | - | 1 | 1 | - | - | - | - | - | 1 | - |
| C104.3 | 2 | 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| C104.4 | 2 | 1 | - | - | - | 1 | 1 | - | - | - | - | - | 1 | - |
| C104.5 | 2 | 1 | - | - | - | 1 | 1 | - | - | - | - | - | 1 | - |
| C104.6 | 2 | 1 | 1 | - | - | 1 | 1 | - | - | - | - | - | 1 | - |
| **C104** | 2 | 1 | 1 | - | - | 1 | 1 | - | - | - | - | - | 1 | - |

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**SUBJECT CODE & NAME: GE3151 & PROBLEM SOLVING AND PYTHON PROGRAMMING**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C105.1 | Explain Components of a Computer System, types of programming languages, types of software with examples and purpose. |
| C105.2 | Perform problem analysis, use algorithms and prepare flow charts, pseudo code for solving simple problems. |
| C105.3 | Use Conditional, iteration constructs of python programming and apply to solve simple problems |
| C105.4 | Use Functions, recursive function, String functions in python programming and apply to perform linear and binary search |
| C105.5 | Explain the various operations for manipulating Tuples, Dictionaries and Use List toper form simple and sorting operations |
| C105.6 | Explain file handling operations, exception handling, modules and packages and illustrate programs for word count, file copy, merge operations and exception handling. |

**CO – PO-PSO MAPPING:**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C105.1 | 2 | 1 | - | - | - | - | - | - | - | - | - | - | 2 | 1 |
| C105.2 | 2 | 1 | - | - | - | - | - | - | - | - | - | - | 2 | 1 |
| C105.3 | 3 | 2 | 1 | - | - | - | - | - | - | - | - | - | 2 | 1 |
| C105.4 | 3 | 2 | 1 | - | - | - | - | - | - | - | - | - | 2 | 1 |
| C105.5 | 3 | 2 | 1 | - | - | - | - | - | - | - | - | - | 2 | 1 |
| C105.6 | 3 | 2 | 1 | - | - | - | - | - | - | - | - | - | 2 | 1 |
| **C105** | 3 | 2 | 1 | - | - | - | - | - | - | - | - | - | 2 | 1 |

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**SUBJECT CODE & NAME: GE3171 & PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C106.1 | Develop simple Python programs using conditional and iterative constructs |
| C106.2 | Develop simple Python programs using built-in functions and user-defined functions |
| C106.3 | Develop a Python program using recursion to implement linear and binary search |
| C106.4 | Develop a Python program using list to implement selection and insertion sort |
| C106.5 | Develop Python programs to implement matrix operations |
| C106.6 | Develop a Python program to implement file handling |

**CO – PO-PSO MAPPING:**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C106.1 | 3 | 2 | 1 | - | 1 | - | - | - | - | - | - | - | 2 | 1 |
| C106.2 | 3 | 2 | 1 | - | 1 | - | - | - | - | - | - | - | 2 | 1 |
| C106.3 | 3 | 2 | 1 | - | 1 | - | - | - | - | - | - | - | 2 | 1 |
| C106.4 | 3 | 2 | 1 | - | 1 | - | - | - | - | - | - | - | 2 | 1 |
| C106.5 | 3 | 2 | 1 | - | 1 | - | - | - | - | - | - | - | 2 | 1 |
| C106.6 | 3 | 2 | 1 | - | 1 | - | - | - | - | - | - | - | 2 | 1 |
| **C106** | 3 | 2 | 1 | - | 1 | - | - | - | - | - | - | - | 2 | 1 |

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**SUBJECT CODE & NAME : BS3171 & PHYSICS AND CHEMISTRY LABORATORY**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C107.1 | Calculate rigidity modulus and Young's modulus of a given material. |
| C107.2 | Examine the size of a given particle, parameters of optical fiber and compute the thickness of a given thin wire. |
| C107.3 | Discover the velocity of ultrasound, compressibility of a given liquid and band gap of a given semiconductor diode. |
| C107.4 | Estimate the Chemical quality parameter of a water sample. |
| C107.5 | Estimate the strength of acid by conductometric and pH metric titration. |
| C107.6 | Estimate the amount of iron content in a given solution using potentiometer |

**CO – PO-PSO MAPPING:**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C107.1 | 3 | 2 | 1 | - | - | - | - | 1 | 1 | 1 | - | - | 1 | - |
| C107.2 | 3 | 2 | 1 | - | - | - | - | 1 | 1 | 1 | - | - | 1 | - |
| C107.3 | 3 | 2 | 1 | - | - | - | - | 1 | 1 | 1 | - | - | 1 | - |
| C107.4 | 3 | 2 | 1 | - | - | - | - | 1 | 1 | 1 | - | - | 1 | - |
| C107.5 | 3 | 2 | 1 | - | - | - | - | 1 | 1 | 1 | - | - | 1 | - |
| C107.6 | 3 | 2 | 1 | - | - | - | - | 1 | 1 | 1 | - | - | 1 | - |
| **C107** | 3 | 2 | 1 | - | - | - | - | 1 | 1 | 1 | - | - | 1 | - |

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## SEMESTER-II

**SUBJECT CODE & NAME : HS3251 & PROFESSIONAL ENGLISH – II**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C108.1 | Listen, Understand and create technical correspondence at advanced level. |
| C108.2 | Respond or answer to the contextual questions, interview questions, form instructions, draft reports |
| C108.3 | Speak and analyze social issues, come out with effective ideas for discussion, understand the passages for meaning and vocabulary |
| C108.4 | Assess error free technical writings, create legible and coherent technical papers, derive ideas of the given texts in a precise form |
| C108.5 | Remember the updated elements of communication skills, nuances of non- verbal communication, business communication |
| C108.6 | Create technical instructions, process instructions, self-appraisals, Resumes, reports on various situations |

**CO – PO MAPPING**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C108.1 | - | - | - | - | - | - | - | - | 3 | 3 | - | 2 | - | - |
| C108.2 | - | - | - | - | - | - | - | - | 3 | 3 | - | 2 | - | - |
| C108.3 | - | - | - | - | - | - | - | - | 3 | 3 | - | 2 | - | - |
| C108.4 | - | - | - | - | - | - | - | - | 2 | 3 | - | 2 | - | - |
| C108.5 | - | - | - | - | - | - | - | - | 3 | 3 | - | 2 | - | - |
| C108.6 | - | - | - | - | - | - | - | - | 3 | 3 | - | 2 | - | - |
| **C108** | - | - | - | - | - | - | - | - | 3 | 3 | - | 2 | - | - |

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**SUBJECT CODE & NAME : MA3251 & STATISTICS AND NUMERICAL METHODS**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C109.1 | Determine the Laplace transform of standard functions using properties |
| C109.2 | Apply Laplace transform and inverse transform to solve the initial value problems |
| C109.3 | Solve the multiple integrals and apply the concept to find areas, volumes |
| C109.4 | Determine the line, surface and volume integrals using Green's, Gauss and Stokes theorems |
| C109.5 | Determine Analytic functions, Bilinear Transformations and apply the concept of conformal mapping to find the images of given curves. |
| C109.6 | Determine the Contour Integrals using Cauchy's Integral and Residue theorems. |

**CO –PO-PSO MAPPING:**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C109.1 | 3 | 2 | 1 | - | - | - | - | 1 | 1 | - | - | - | - | - |
| C109.2 | 3 | 2 | 1 | - | - | - | - | 1 | 1 | - | - | - | - | - |
| C109.3 | 3 | 2 | 1 | - | - | - | - | 1 | 1 | - | - | - | - | - |
| C109.4 | 3 | 2 | 1 | - | - | - | - | 1 | 1 | - | - | - | 1 | - |
| C109.5 | 3 | 2 | 1 | - | - | - | - | 1 | 1 | - | - | - | 1 | - |
| C109.6 | 3 | 2 | 1 | - | - | - | - | 1 | 1 | - | - | - | 1 | - |
| **C109** | 3 | 2 | 1 | - | - | - | - | 1 | 1 | - | - | - | 1 | - |

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**SUBJECT CODE & NAME: PH3256 & PHYSICS FOR INFORMATION SCIENCE**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| **C110.1** | Gain knowledge on classical and quantum electron theories and energy band structures. |
| **C110.2** | Acquire knowledge on basis of semiconductor physics and its applications in various devices. |
| **C110.3** | Get knowledge on magnetic and dielectric properties of materials. |
| **C110.4** | Have the necessary understanding on the functioning of optical materials for opto electronics. |
| **C110.5** | Illustrate the basics of quantum structures and their applications in spintronics. |
| **C110.6** | Introduction to Carbon nanotubes and explain its properties and applications |

**CO – PO-PSO MAPPING:**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C110.1 | 3 | 1 | 1 | - | - | - | - | 2 | 1 | - | - | - | 1 | - |
| C110.2 | 3 | 1 | 1 | - | - | - | - | 2 | 1 | - | - | - | 1 | - |
| C110.3 | 3 | 1 | 1 | - | - | - | - | 2 | 1 | - | - | - | 1 | - |
| C110.4 | 3 | 1 | 1 | - | - | - | - | 2 | 1 | - | - | - | 1 | - |
| C110.5 | 3 | 1 | 1 | - | - | - | - | 2 | 1 | - | - | - | 1 | - |
| C110.6 | 3 | 1 | 1 | - | - | - | - | 2 | 1 | - | - | - | 1 | - |
| **C110** | 3 | 1 | 1 | - | - | - | - | 2 | 1 | - | - | - | 1 | - |

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**SUBJECT CODE & NAME : BE3251 & ELECTRICAL AND INSTRUMENTATION ENGINEERING**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| **C111.1** | Apply the fundamental laws and network theorems to solve simple and complex linear circuits |
| **C111.2** | Explain the basic principle of electrical machines and their performance |
| **C111.3** | Describe the different energy sources, protective devices and their field applications |
| **C111.4** | Discuss the fundamentals of electronic circuit using diode, transistor and Op amps. |
| **C111.5** | Illustrate about renewable sources and common domestic loads. |
| **C111.6** | Explain the principles and operation of measuring instruments and transducer |

**CO – PO-PSO MAPPING:**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C111.1 | 3 | 2 | 1 | 1 | - | - | - | 2 | - | - | - | 2 | 2 | - |
| C111.2 | 3 | 2 | 1 | 1 | - | - | - | 2 | - | - | - | 2 | 2 | - |
| C111.3 | 3 | 2 | 1 | 1 | - | - | - | 2 | - | - | - | 2 | 2 | - |
| C111.4 | 3 | 2 | 1 | 1 | - | - | - | 2 | - | - | - | 2 | 2 | - |
| C111.5 | 3 | 2 | 1 | 1 | - | - | - | 2 | - | - | - | 2 | 2 | - |
| C111.6 | 3 | 2 | 1 | 1 | - | - | - | 2 | - | - | - | 2 | 2 | - |
| **C111** | 3 | 2 | 1 | 1 | - | - | - | 2 | - | - | - | 2 | 2 | - |

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**SUBJECT CODE & NAME: GE3251& ENGINEERING GRAPHICS**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C112.1 | Familiarize the fundamentals and standards of engineering graphics |
| C112.2 | Perform free hand sketching of basic construction and machine equipments. |
| C112.3 | Project orthographic projection of lines and plane surfaces |
| C112.4 | Draw the projection of solids and development of solid. |
| C112.5 | Visualize and project isometric perspective section of solids and surfaces. |
| C112.6 | Draw the free hand sketching of simple objects. |

**CO – PO-PSO MAPPING:**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C112.1 | 2 | 1 | - | - | 1 | - | - | - | 1 | - | - | - | 1 | 1 |
| C112.2 | 2 | 1 | - | - | 1 | - | - | - | 1 | - | - | - | 1 | 1 |
| C112.3 | 2 | 1 | - | - | 1 | - | - | - | 1 | - | - | - | 1 | 1 |
| C112.4 | 2 | 1 | - | - | 1 | - | - | - | 1 | - | - | - | 1 | 1 |
| C112.5 | 2 | 1 | - | - | 1 | - | - | - | 1 | - | - | - | 1 | 1 |
| C112.6 | 2 | 1 | - | - | 1 | - | - | - | 1 | - | - | - | 1 | 1 |
| **C112** | 2 | 1 | - | - | 1 | - | - | - | 1 | - | - | - | 1 | 1 |

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**SUBJECT CODE & NAME : CS3251 &PROGRAMMING IN C**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C113.1 | Describe various basic programming constructs in C |
| C113.2 | Solve simple mathematical problems using arrays and strings. |
| C113.3 | Illustrate the usage of functions and pointers to develop C programs. |
| C113.4 | Ability to work with arrays of complex objects. |
| C113.5 | Develop simple applications in C using structures and unions. |
| C113.6 | Make use of sequential and random access operations for file handling processes. |

**CO – PO-PSO MAPPING:**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C113.1 | 3 | 2 | 1 | - | 1 | - | - | - | - | - | - | - | 2 | 1 |
| C113.2 | 3 | 2 | 1 | - | 1 | - | - | - | - | - | - | - | 2 | 1 |
| C113.3 | 3 | 2 | 1 | - | 1 | - | - | - | - | - | - | - | 2 | 1 |
| C113.4 | 3 | 2 | 1 | - | 1 | - | - | - | - | - | - | - | 2 | 1 |
| C113.5 | 3 | 2 | 1 | - | 1 | - | - | - | - | - | - | - | 2 | 1 |
| C113.6 | 3 | 2 | 1 | - | 1 | - | - | - | - | - | - | - | 2 | 1 |
| **C113** | 3 | 2 | 1 | - | 1 | - | - | - | - | - | - | - | 2 | 1 |

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**SUBJECT CODE & NAME : GE3271 & ENGINEERING PRACTICES LABORATORY**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C114.1 | Apply the knowledge of pipeline connections to household fittings and industrial buildings |
| C114.2 | Prepare the different joints in roofs, doors windows and furniture |
| C114.3 | Perform step turning operation in a lathe |
| C114.4 | Perform the various welding processes and know about it s applications |
| C114.5 | Produce a funnel using sheet metal |
| C114.6 | Elaborate on the components, Gates, Soldering practices |

**CO – PO-PSO MAPPING:**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C114.1 | 3 | 2 | 2 | - | - | - | - | 1 | 1 | 2 | - | - | 1 | - |
| C114.2 | 3 | 2 | 2 | - | - | - | - | 1 | 1 | 2 | - | - | 1 | - |
| C114.3 | 3 | 2 | 2 | - | - | - | - | 1 | 1 | 2 | - | - | 1 | - |
| C114.4 | 3 | 2 | 2 | - | - | - | - | 1 | 1 | 2 | - | - | 1 | - |
| C114.5 | 3 | 2 | 2 | - | - | - | - | 1 | 1 | 2 | - | - | 1 | - |
| C114.6 | 3 | 2 | 2 | - | - | - | - | 1 | 1 | 2 | - | - | 1 | - |
| **C114** | 3 | 2 | 2 | - | - | - | - | 1 | 1 | 2 | - | - | 1 | - |

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**SUBJECT CODE & NAME: CS3271 & PROGRAMMING IN C LABORATORY**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C115.1 | Develop simple programs in C using basic constructs |
| C115.2 | Develop programs in C using arrays and strings to solve simple mathematical problems. |
| C115.3 | Apply functions and pointers to develop C programs |
| C115.4 | Develop applications in C using strings, pointers and functions |
| C115.5 | Develop application in C using structures |
| C115.6 | Develop application in C using file processing |

**CO –PO-PSO MAPPING:**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C115.1 | 3 | 2 | 2 | - | - | - | - | 1 | 1 | 2 | - | - | 1 | 1 |
| C115.2 | 3 | 2 | 2 | - | - | - | - | 1 | 1 | 2 | - | - | 1 | 1 |
| C115.3 | 3 | 2 | 2 | - | - | - | - | 1 | 1 | 2 | - | - | 1 | 1 |
| C115.4 | 3 | 2 | 2 | - | - | - | - | 1 | 1 | 2 | - | - | 1 | 1 |
| C115.5 | 3 | 2 | 2 | - | - | - | - | 1 | 1 | 2 | - | - | 1 | 1 |
| C115.6 | 3 | 2 | 2 | - | - | - | - | 1 | 1 | 2 | - | - | 1 | 1 |
| **C115** | 3 | 2 | 2 | - | - | - | - | 1 | 1 | 2 | - | - | 1 | 1 |

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## SEMESTER-III

**SUBJECT CODE & NAME:** MA3354 & DISCRETE MATHEMATICS

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C201.1 | Determine the knowledge of the concepts needed to test the logic of a program. |
| C201.2 | Discuss the understanding in identifying structures on many levels. |
| C201.3 | Apply functions and pointers to develop C programs |
| C201.4 | Apply of the counting principles. |
| C201.5 | Develop concepts and properties of algebraic structures such as groups, |
| C201.6 | Develop concepts and properties of rings and fields |

**CO – PO MAPPING**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C201.1 | - | - | - | - | - | - | - | - | 3 | 3 | - | 2 | - | - |
| C201.2 | - | - | - | - | - | - | - | - | 3 | 3 | - | 2 | - | - |
| C201.3 | - | - | - | - | - | - | - | - | 3 | 3 | - | 2 | - | - |
| C201.4 | - | - | - | - | - | - | - | - | - | 3 | - | 2 | - | - |
| C201.5 | - | - | - | - | - | - | - | - | 2 | 3 | - | 2 | - | - |
| C201.6 | - | - | - | - | - | - | - | - | 3 | 3 | - | 2 | - | - |
| **C201** | - | - | - | - | - | - | - | - | 3 | 3 | - | 2 | - | - |

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SEMESTER - III

**SUBJECT CODE & NAME : CS3351 & DIGITAL PRINCIPLES AND COMPUTER ORGANIZATION**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C202.1 | Design various combinational digital circuits using logic gates . |
| C202.2 | Design sequential circuits and analyze the design procedures |
| C202.3 | State the fundamentals of computer systems and analyze the execution of an instruction |
| C202.4 | Analyze different types of control design and identify hazards |
| C202.5 | Identify the characteristics of various memory systems and I/O communication |
| C202.6 | Analyze the advanced computer hardware applications |

**CO –PO-PSO MAPPING:**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C202.1 | 3 | 2 | 1 | 1 | 2 | - | - | - | 1 | 1 | 2 | 1 | 2 | 2 |
| C202.2 | 2 | 2 | 1 | 2 | 2 | - | - | - | 1 | 1 | 1 | 2 | 2 | 2 |
| C202.3 | 2 | 1 | - | 1 | 1 | - | - | - | 2 | 1 | 1 | 2 | 2 | 3 |
| C202.4 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | - | 1 | 2 | 1 | 3 | 2 | 2 |
| C202.5 | 3 | 2 | 2 | 1 | 2 | - | - | - | 1 | 1 | 2 | 2 | 3 | 3 |
| C202.6 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | - | 1 | 1 | 1 | 2 | 2 | 2 |
| **C202** | 2 | 2 | 1 | 1 | 2 | 1 | 1 | - | 1 | 1 | 1 | 2 | 2 | 2 |

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**SUBJECT CODE & NAME: CS3352 FOUNDATIONS OF DATA SCIENCE**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C203.1 | Define the data science process |
| C203.2 | Understand different types of data description for data science process |
| C203.3 | Gain knowledge on relationships between data |
| C203.4 | Use the Python Libraries for Data Wrangling |
| C203.5 | Apply visualization Libraries in Python to interpret and explore data |
| C203.6 | Analyze the advanced computer hardware applications |

**CO-PO-PSO MAPPING:**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C203.1 | 2 | 2 | 1 | 2 | 2 | - | - | - | 1 | 1 | 1 | 2 | 2 | 2 |
| C203.2 | 2 | 1 | - | 1 | 1 | - | - | - | 2 | 1 | 1 | 2 | 2 | 2 |
| C203.3 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | - | 1 | 2 | 1 | 3 | 2 | 2 |
| C203.4 | 3 | 2 | 2 | 1 | 2 | - | - | - | 1 | 1 | 2 | 2 | 3 | 3 |
| C203.5 | 2 | 2 | 1 | 2 | 2 | - | - | - | 1 | 1 | 1 | 2 | 2 | 2 |
| C203.6 | 2 | **2** | 1 | **2** | 2 | 1 | 1 | - | 1 | 1 | 1 | 2 | 2 | 2 |
| **C203** | 2 | 2 | 1 | 2 | 2 | 1 | 1 | - | 1 | 1 | 1 | 2 | 2 | 2 |

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**SUBJECT CODE & NAME :CS3301 DATA STRUCTURES**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C204.1 | Define linear and non-linear data structures |
| C204.2 | Implement linear and non-linear data structure operations |
| C204.3 | Use appropriate linear/non–linear data structure operations for solving a given problem |
| C204.4 | Apply appropriate graph algorithms for graph applications |
| C204.5 | Analyze the various searching and sorting algorithms |
| C204.6 | Analyze the advanced computer hardware applications |

**CO-PO-PSO MAPPING**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C204.1 | 2 | 3 | 1 | 2 | 2 | 1 | 1 | - | 1 | 2 | 1 | 3 | 2 | 1 |
| C204.2 | 1 | 2 | 1 | 2 | 2 | - | - | - | 1 | 1 | 1 | 2 | 2 | 2 |
| C204.3 | 2 | 3 | 1 | 2 | 3 | - | - | - | 1 | 1 | 1 | 2 | 2 | 1 |
| C204.4 | 2 | 1 | - | 1 | 1 | - | - | - | 2 | 1 | 1 | 2 | 2 | 3 |
| C204.5 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | - | 1 | 2 | 1 | 3 | 2 | 2 |
| C204.6 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | - | 1 | 1 | 1 | 2 | 2 | 2 |
| **C204** | 2 | 2 | 1 | 2 | 2 | 1 | 1 | - | 1 | 1 | 1 | 2 | 2 | 2 |

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**SUBJECT CODE & NAME :CS3391 OBJECT ORIENTED PROGRAMMING**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C205.1 | Apply the concepts of classes and objects to solve simple problems |
| C205.2 | Develop programs using inheritance, packages and interfaces |
| C205.3 | Make use of exception handling mechanisms and multithreaded model to solve real world problems |
| C205.4 | Build Java applications with I/O packages, string classes, Collections and generics concepts |
| C205.5 | Integrate the concepts of event handling and JavaFX components and controls for developing GUI based applications |
| C205.6 | Analyze the advanced java web applications |

**CO-PO-PSO MAPPING:**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C205.1 | 1 | 1 | 3 | 1 | 3 | - | - | - | 3 | 2 | 2 | 2 | 3 | 1 |
| C205.2 | 2 | 1 | 3 | 2 | 1 | - | - | - | 2 | 1 | 1 | 3 | 3 | 3 |
| C205.3 | 3 | 3 | 1 | 2 | 2 | - | - | - | 3 | 2 | 1 | 2 | 3 | 1 |
| C205.4 | 3 | 1 | 2 | 2 | 2 | - | - | - | 1 | 2 | 1 | 3 | 3 | 1 |
| C205.5 | 1 | 1 | 2 | 3 | 2 | - | - | - | 3 | 2 | 1 | 2 | 3 | 3 |
| C205.6 | 2 | 1 | 2 | 2 | 2 | - | - | - | 2 | 2 | 1 | 2 | 3 | 2 |
| **C205** | 2 | 1 | 2 | 2 | 2 | - | - | - | 2 | 2 | 1 | 2 | 3 | 2 |

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**SUBJECT CODE & NAME : CS3311 DATA STRUCTURES LABORATORY**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C206.1 | Implement Linear data structure algorithms |
| C206.2 | Implement applications using Stacks and Linked lists |
| C206.3 | Implement Binary Search tree and AVL tree operations |
| C206.4 | Implement graph algorithms |
| C206.5 | Analyze the various searching and sorting algorithms |
| C206.6 | Analyze the various data structure applications |

**CO-PO-PSO MAPPING**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C206.1 | 1 | 2 | 2 | 1 | - | - | - | - | 2 | 1 | 2 | 2 | 2 | 2 |
| C206.2 | 3 | 3 | 1 | 1 | - | - | - | - | 1 | 1 | 1 | 3 | 1 | 2 |
| C206.3 | 2 | 1 | 3 | 1 | - | - | - | - | 1 | 1 | 2 | 3 | 3 | 3 |
| C206.4 | 3 | 1 | 3 | 3 | - | - | - | - | 1 | 2 | 3 | 3 | 2 | 1 |
| C206.5 | 3 | 2 | 1 | 1 | 2 | - | - | - | 3 | 3 | 3 | 1 | 3 | 1 |
| C206.6 | 2 | **2** | 2 | 1 | 2 | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 |
| **C206** | 2 | 2 | 2 | 1 | 2 | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 |

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**SUBJECT CODE & NAME :CS3381 OBJECT ORIENTED PROGRAMMING LABORATORY**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C207.1 | Implement Linear data structure algorithms |
| C207.2 | Implement applications using Stacks and Linked lists |
| C207.3 | Implement Binary Search tree and AVL tree operations |
| C207.4 | Implement graph algorithms |
| C207.5 | Analyze the various searching and sorting algorithms |
| C207.6 | Analyze the various data structure applications |

**CO-PO-PSO MAPPING**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C207.1 | 2 | 1 | 2 | 1 | - | - | - | - | 1 | 2 | 2 | 2 | 1 | 2 |
| C207.2 | 2 | 1 | 3 | 1 | - | - | - | - | 2 | 3 | 3 | 2 | 1 | 3 |
| C207.3 | 2 | 2 | 1 | 2 | 1 | - | - | - | 1 | 2 | 1 | 3 | 2 | 3 |
| C207.4 | 2 | 2 | 1 | 3 | - | - | - | - | 3 | 1 | 1 | 1 | 2 | 1 |
| C207.5 | 1 | 3 | 3 | 1 | 3 | - | - | - | 1 | 1 | 1 | 1 | 2 | 1 |
| C207.6 | 2 | 2 | 2 | 2 | 2 | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 |
| **C207** | 2 | 2 | 2 | 2 | 2 | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 |

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**SUBJECT CODE & NAME : CS3361 DATA SCIENCE LABORATORY**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C208.1 | Make use of the python libraries for data science |
| C208.2 | Make use of the basic Statistical and Probability measures for data science |
| C208.3 | Perform descriptive analytics on the benchmark data sets |
| C208.4 | Perform correlation and regression analytics on standard data sets |
| C208.5 | Present and interpret data using visualization packages in Python |
| C208.6 | Analyze the Apply and explore various plotting functions on UCI data sets |

**CO-PO-PSO MAPPING**

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C208.1 | 3 | 2 | 1 | 1 | - | - | - | - | 1 | 3 | 3 | 3 | 1 | 3 |
| C208.2 | 3 | 2 | 2 | 3 | 1 | - | - | - | 3 | 1 | 3 | 2 | 1 | 3 |
| C208.3 | 3 | 2 | 1 | 3 | 1 | - | - | - | 2 | 1 | 1 | 1 | 3 | 2 |
| C208.4 | 2 | 3 | 1 | 3 | - | - | - | - | 2 | 3 | 2 | 3 | 3 | 3 |
| C208.5 | 1 | 2 | 3 | 1 | 1 | - | - | - | 2 | 1 | 3 | 1 | 1 | 3 |
| C208.6 | 2 | 2 | 2 | 2 | 1 | - | - | - | 2 | 2 | 2 | 2 | 2 | 3 |
| **C208** | 2 | 2 | 2 | 2 | 1 | - | - | - | 2 | 2 | 2 | 2 | 2 | 3 |

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SEMESTER -IV

**SUBJECT CODE & NAME : CS3452 THEORY OF COMPUTATION**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C209.1 | Construct automata theory using Finite Automata |
| C209.2 | Write regular expressions for any pattern |
| C209.3 | Design context free grammar and Pushdown Automata |
| C209.4 | Design Turing machine for computational functions |
| C209.5 | Differentiate between decidable and undecidable problems |
| C209.6 | Analyze the advanced theoretical problems |

## CO's-PO's&PSO's MAPPING

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C209.1 | 1 | 3 | 2 | 3 | - | - | - | - | 1 | 1 | 2 | 3 | 1 | 3 |
| C209.2 | 2 | 2 | 3 | 2 | 1 | - | - | - | 3 | 3 | 2 | 3 | 3 | 1 |
| C209.3 | 2 | 2 | 3 | 2 | 1 | - | - | - | 1 | 3 | 1 | 2 | 1 | 2 |
| C209.4 | 2 | 2 | 2 | 1 | - | - | - | - | 1 | 3 | 3 | 2 | 1 | 3 |
| C209.5 | 2 | 2 | 2 | 1 | 1 | - | - | - | 1 | 1 | 3 | 2 | 3 | 1 |
| C209.6 | 2 | 2 | 2 | 1 | 1 | - | - | - | 1 | 1 | 3 | 2 | 3 | 1 |
| C209 | 2 | 2 | 2 | 2 | 1 | - | - | - | 1 | 2 | 2 | 2 | 2 | 2 |

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**SUBJECT CODE & NAME :CS3491 ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C210.1 | Use appropriate search algorithms for problem solving |
| C210.2 | Apply reasoning under uncertainty |
| C210.3 | Build supervised learning models |
| C210.4 | Build ensembling and unsupervised models |
| C210.5 | Build deep learning neural network models |
| C210.6 | Apply the machine learning models |

## CO's-PO's&PSO's MAPPING

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C210.1 | 3 | 2 | 3 | 3 | - | - | - | - | 1 | 3 | 3 | 3 | 1 | 2 |
| C210.2 | 1 | 1 | 1 | 3 | 1 | - | - | - | 1 | 2 | 1 | 3 | 2 | 3 |
| C210.3 | 2 | 1 | 2 | 1 | 1 | - | - | - | 2 | 1 | 1 | 3 | 1 | 1 |
| C210.4 | 3 | 1 | 3 | 1 | - | - | - | - | 2 | 1 | 2 | 1 | 2 | 2 |
| C210.5 | 3 | 1 | 1 | 2 | 2 | - | - | - | 3 | 1 | 2 | 3 | 2 | 1 |
| C210.6 | 2 | 1 | 2 | 2 | 1 | - | - | - | 2 | 2 | 2 | 3 | 2 | 2 |
| C210 | 2 | 1 | 2 | 2 | 1 | - | - | - | 2 | 2 | 2 | 3 | 2 | 2 |

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**SUBJECT CODE & NAME : CS3492 DATABASE MANAGEMENT SYSTEMS**

## COURSE OUTCOMES:

**After the Course the Students should be able to:**

| | |
|---|---|
| C211.1 | Construct SQL Queries using relational algebra |
| C211.2 | Design database using ER model and normalize the database |
| C211.3 | Construct queries to handle transaction processing and maintain consistency of the database |
| C211.4 | Compare and contrast various indexing strategies and apply the knowledge to tune the performance of the database |
| C211.5 | Appraise how advanced databases differ from Relational Databases and find a suitable database for the given requirement. |
| C211.6 | Apply the database web applications. |

## CO's-PO's&PSO'sMAPPING

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C211.1 | 2 | 2 | 3 | 2 | 1 | - | - | - | 2 | 1 | 1 | 1 | 2 | 1 |
| C211.2 | 3 | 1 | 1 | 1 | 1 | - | - | - | 2 | 3 | 3 | 3 | 3 | 1 |
| C211.3 | 3 | 2 | 3 | 2 | 1 | - | - | - | 2 | 1 | 1 | 2 | 2 | 3 |
| C211.4 | 1 | 2 | 3 | 2 | - | - | - | - | 3 | 2 | 3 | 3 | 1 | 2 |
| C211.5 | 1 | 1 | 3 | 3 | 2 | - | - | - | 1 | 3 | 3 | 1 | 2 | 2 |
| C211.6 | 1 | 1 | 3 | 3 | 2 | - | - | - | 1 | 3 | 3 | 1 | 2 | 2 |
| C211 | 2 | 2 | 3 | 2 | 1 | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 |

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**SUBJECT CODE & NAME : CS3401 ALGORITHMS**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C212.1 | Analyze the efficiency of algorithms using various frameworks |
| C212.2 | Apply graph algorithms to solve problems and analyze their efficiency |
| C212.3 | Make use of algorithm design techniques like divide and conquer, dynamic programming and greedy techniques to solve problems |
| C212.4 | Use the state space tree method for solving problems |
| C212.5 | Solve problems using approximation algorithms and randomized algorithms. |
| C212.6 | Apply the randomized algorithms in theoretical problem |

## CO's-PO's&PSO's MAPPING

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C212.1 | 2 | 1 | 3 | 2 | - | - | - | - | 2 | 1 | 2 | 3 | 2 | 1 |
| C212.2 | 2 | 1 | 1 | 1 | 1 | - | - | - | 1 | 3 | 3 | 3 | 2 | 3 |
| C212.3 | 1 | 3 | 3 | 3 | 1 | - | - | - | 1 | 2 | 1 | 2 | 2 | 1 |
| C212.4 | 1 | 2 | 2 | 3 | - | - | - | - | 2 | 3 | 3 | 1 | 3 | 1 |
| C212.5 | 1 | 2 | 3 | 2 | 3 | - | - | - | 3 | 1 | 3 | 3 | 1 | 3 |
| C212.6 | 1 | 2 | 3 | 2 | 3 | - | - | - | 3 | 1 | 3 | 3 | 1 | 3 |
| C212 | 1 | 2 | 3 | 2 | 2 | - | - | - | 2 | 2 | 3 | 3 | 2 | 2 |

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**SUBJECT CODE & NAME : CS3451 INTRODUCTION TO OPERATING SYSTEMS**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C213.1 | Analyze various scheduling algorithms and process synchronization |
| C213.2 | Explain deadlock prevention and avoidance algorithms. |
| C213.3 | Compare and contrast various memory management schemes |
| C213.4 | Explain the functionality of file systems, I/O systems, and Virtualization |
| C213.5 | Compare iOS and Android Operating Systems. |
| C213.6 | Apply the randomized algorithms in theoretical problem |

## CO's-PO's & PSO's MAPPING

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C213.1 | 3 | 1 | 2 | 2 | - | - | - | - | 3 | 2 | 3 | 1 | 1 | 2 |
| C213.2 | 2 | 2 | 3 | 1 | 1 | - | - | - | 2 | 1 | 1 | 2 | 2 | 1 |
| C213.3 | 1 | 3 | 2 | 2 | 1 | - | - | - | 2 | 2 | 1 | 1 | 1 | 2 |
| C213.4 | 1 | 3 | 3 | 3 | - | - | - | - | 1 | 2 | 1 | 2 | 1 | 3 |
| C213.5 | 3 | 1 | 2 | 1 | 1 | - | - | - | 3 | 2 | 3 | 2 | 2 | 2 |
| C213.6 | 3 | 1 | 2 | 1 | 1 | - | - | - | 3 | 2 | 3 | 2 | 2 | 2 |
| C213 | 2 | 2 | 2 | 2 | 1 | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 |

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**SUBJECT CODE & NAME : CS3461 OPERATING SYSTEMS LABORATORY**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C214.1 | Define and implement UNIX Commands |
| C214.2 | Compare the performance of various CPU Scheduling Algorithms . |
| C214.3 | Compare and contrast various Memory Allocation Methods |
| C214.4 | Define File Organization and File Allocation Strategies |
| C214.5 | Compare iOS and Android Operating Systems. |
| C214.6 | Implement various Disk Scheduling Algorithms |

## CO's-PO's & PSO's MAPPING

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C214.1 | 3 | 1 | 3 | 1 | 1 | - | - | - | 1 | 3 | 3 | 3 | 2 | 1 |
| C214.2 | 3 | 1 | 1 | 2 | 2 | - | - | - | 3 | 2 | 1 | 1 | 3 | 1 |
| C214.3 | 3 | 3 | 2 | 1 | 2 | - | - | - | 3 | 3 | 1 | 2 | 2 | 2 |
| C214.4 | 1 | 2 | 2 | 3 | 2 | - | - | - | 3 | 1 | 3 | 1 | 1 | 2 |
| C214.5 | 2 | 2 | 1 | 1 | 3 | - | - | - | 1 | 2 | 2 | 3 | 1 | 3 |
| C214.6 | 2 | 2 | 1 | 1 | 3 | - | - | - | 1 | 2 | 2 | 3 | 1 | 3 |
| C214 | 2 | 2 | 2 | 2 | 2 | - | - | | 2 | 2 | 2 | 2 | 2 | 2 |

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**SUBJECT CODE & NAME : CS3461 OPERATING SYSTEMS LABORATORY**

## COURSE OUTCOMES:

**After the Course the Students should be able to:**

| | |
|---|---|
| C215.1 | Define and implement UNIX Commands |
| C215.2 | Compare the performance of various CPU Scheduling Algorithms . |
| C215.3 | Compare and contrast various Memory Allocation Methods |
| C215.4 | Define File Organization and File Allocation Strategies |
| C215.5 | Compare iOS and Android Operating Systems. |
| C215.6 | Implement various Disk Scheduling Algorithms |

CO's-PO's & PSO's MAPPING

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C215.1 | 3 | 1 | 3 | 1 | 1 | - | - | - | 1 | 3 | 3 | 3 | 2 | 1 |
| C215.2 | 3 | 1 | 1 | 2 | 2 | - | - | - | 3 | 2 | 1 | 1 | 3 | 1 |
| C215.3 | 3 | 3 | 2 | 1 | 2 | - | - | - | 3 | 3 | 1 | 2 | 2 | 2 |
| C215.4 | 1 | 2 | 2 | 3 | 2 | - | - | - | 3 | 1 | 3 | 1 | 1 | 2 |
| C215.5 | 2 | 2 | 1 | 1 | 3 | - | - | - | 1 | 2 | 2 | 3 | 1 | 3 |
| C215.6 | 2 | 2 | 1 | 1 | 3 | - | - | - | 1 | 2 | 2 | 3 | 1 | 3 |
| C215 | 2 | 2 | 2 | 2 | 2 | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 |

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**SUBJECT CODE & NAME :CS3481 DATABASE MANAGEMENT SYSTEMS LABORATORY**

**COURSE OUTCOMES:**

**After the Course the Students should be able to:**

| | |
|---|---|
| C216.1 | Create databases with different types of key constraints |
| C216.2 | Construct simple and complex SQL queries using DML and DCL commands . |
| C216.3 | Use advanced features such as stored procedures and triggers and incorporate in GUI based application development. |
| C216.4 | Create an XML database and validate with meta-data (XML schema). |
| C216.5 | Create and manipulate data using NOSQL database |
| C216.6 | Implement database web applications |

## CO's-PO's &PSO's MAPPING

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C216.1 | 3 | 3 | 3 | 3 | - | - | - | - | 3 | 1 | 3 | 2 | 2 | 3 |
| C216.2 | 2 | 2 | 3 | 2 | 2 | - | - | - | 1 | 2 | 3 | 3 | 2 | 1 |
| C216.3 | 3 | 3 | 2 | 1 | 1 | - | - | - | 1 | 1 | 1 | 3 | 2 | 3 |
| C216.4 | 1 | 3 | 3 | 3 | 1 | - | - | - | 1 | 1 | 3 | 2 | 3 | 1 |
| C216.5 | 3 | 2 | 1 | 1 | 1 | - | - | - | 2 | 2 | 3 | 1 | 3 | 1 |
| C216.6 | 3 | 3 | 3 | 3 | - | - | - | - | 3 | 1 | 3 | 2 | 2 | 3 |
| C216 | 3 | 3 | 3 | 2 | 1 | - | - | - | 2 | 1 | 3 | 2 | 2 | 2 |

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