**COURSE TITLE: GENERAL ENGLISH -I**
**COURSE CODE: EN18101**
**CREDITS: 3**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs :**

## B.Sc

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems**.**
- **PO2**. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4.Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5.Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOME ( DEPARTMENT WISE):**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field

| | **COURSE OUTCOMES** | **BLOOM'S TAXONOMY LEVEL** |
|---|---|---|
| **CO1** | Distinguish between words which are either spelt or pronounced alike, yet render distinct meanings; imparting a sound clarity on everyday usage and miscommunications embedded in language<br>Develop the art of parallel listening and writing; the art of swift, crisp and organized writing through note making | (III) Apply |
| **CO2** | Improve diction and gain understanding on the tense component, a pivotal constituent for language structuring. Transfer the data in pictorial or graphical representations to a textual format, in order to restate information in different forms in their present academic or future professional lives. | (IV) Analyze |
| **CO3** | Identify with economical word constructions, paying specific attention to vocabulary building in English, Construct their writing skills in writing formal letters and to design their curriculum vitae efficiently to venture into future job endeavours | (IV) Analyze |
| **CO4** | Interpret subject-verb agreement, the basic part involved in sentence constructing to improve their linguistic skills, Gain knowledge to plan technical and project reports for, writing responses to instructions for a person in authority, or for presenting a proposal to the clients. | (II) Understand |
| **CO5** | Extend their language efficiency through the grammar component of commonly confused and misspelt words, and errors related to vocabulary and different aspects of grammar, which would be seemingly helpful for language delivery. Cite varied sources of references, and become skilled at constructing a bibliography, an important piece of academic writing to acknowledge the author's debt to others, for facts and ideas a book or paper is built on. | (III) Apply |

**Table 1: CO, PO, PSO MAPPING**

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | P08 | PSO1 | PSO2 | PSO3 | PSO4 | |
| 1 | H | | S | H | | | | | H | S | | | |
| 2 | | H | | H | | | | | H | | | S | |
| 3 | | S | H | | | | | | H | | H | | |
| 4 | H | H | H | | | | | | S | | H | | |
| 5 | H | H | H | | | | | | | H | | | |

**H: Highly Supportive** **S: Supportive**

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO | WEEKLY | | MIDSEMESTER | | PRE-FINAL | | ASSIGNMENT | | VIVA | | | EXTERNAL EXAMS | | | |
| | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E) | Co-Wise Internal Average (Avg of A,B,C, D,E) (F) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 | Co-Wise External Average (G) | CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K) |
| C01 | 95 | 3 | 96 | 3 | 97 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO2 | ------ | ------ | 96 | 3 | 97 | 3 | --- | | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO3 | ------ | ----- | 96 | 3 | 97 | 3 | ---- | | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO4 | ------ | ------ | ------ | ------ | 97 | 3 | ---- | | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 97 | 3 | ----- | | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| TOTAL INTERNAL AVERAGE [Avg of all (F)]: 3 | | | | | | | | | | | | | | Total External Average (Avg of G): 3 | Total CO attainment For Entire Course (Avg of 3 |

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | | **H (3)** | | **H (3)** | | | | **H (3)** |
| 2 | **H (3)** | | **H (3)** | | | **H (3)** | | |
| 3 | | **H (3)** | | | **H (3)** | | | **H (3)** |
| 4 | **H (3)** | | | | **H (3)** | | **H (3)** | |
| 5 | **H (3)** | | **H (3)** | | | **H (3)** | | |
| Column (a) | **Average of Cos for PO1 3** | **Average of Cos for PO2 3** | **Average of Cos for PO3 3** | **Average of Cos for PO4 3** | **Average of Cos for PO5 3** | **Average of Cos for PO6 3** | **Average of Cos for PO7 3** | **Average of Cos for PO8 3** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X Total CO attainment For Entire Course value in table 2 3** | **Average of PO2: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO3: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO4: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO5: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO6: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO7: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO8: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 3** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 3** | | | | | | | |

**COURSE TITLE: VALUE EDUCATION & PERSONALITY DEVELOPMENT**
**COURSE CODE: VE18001**
**CREDITS: 2**

**DEPARTMENT:COMPUTER SYSTEMS & ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOME ( DEPARTMENT WISE) or PSOs:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | **CO 1:** To identify a sound understanding on the formation of words and to demonstrate the functional grammatical component in the sentence. | IV ( analyze) |
| **CO2** | **CO 2:** To paraphrase ideas and thoughts in a coherent, neat and organized manner in order to utilize the writing skills for sound writing propagandas. | II ( understand) |
| **CO3** | **CO3**: To create an understanding on Indian Literature, alongside to develop and chisel their communication skills. | VI ( create) |
| **CO4** | **CO4:** To recognize the moral element which underlies in the short story; an exposure to informal language. | I( knowledge) |
| **CO5** | **CO5**: To develop listening and speaking skills through effective sentence constructions and efficient delivery. | VI ( create) |

**Table 1: CO, PO, PSO MAPPING**

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | |
| 1 | **H** | | | **H** | | | **H** | **S** | | **H** | **H** | | |
| 2 | | **H** | | | | **H** | | **H** | **H** | | **H** | | |
| 3 | **H** | | **H** | | **H** | **H** | | **H** | | **H** | | **S** | |
| 4 | **H** | **S** | | | | | | | | | | **H** | |
| 5 | **H** | | **H** | **H** | **S** | **H** | | | | **H** | **S** | | |

## Table 2: COURSE OUTCOME ATTAINMENT

| CO | WEEKLY | | MIDSEMESTER | | PRE-FINAL | | ASSIGNMENT | | VIVA | | | EXTERNAL EXAMS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PASS % | ATTAINMENT LEVEL 70%>=3 60-70%= 2 50-60%=1 <50%=0 (A) | PASS % | ATTAINMENT LEVEL 70%>=3 60-70%= 2 50-60%=1 <50%=0 (B) | PASS % | ATTAINMENT LEVEL 70%>=3 60-70%= 2 50-60%=1 <50%=0 (C) | PASS% | ATTAINMENT LEVEL 70%>=3 60-70%= 2 50-60%=1 <50%=0 (D) | PASS % | ATTAINMENT LEVEL 70%>=3 60-70%= 2 50-60%=1 <50%=0 (E) | Co-Wise Internal Average (F) | PASS% | ATTAINMENT LEVEL 70%>=3 60-70%= 2 50-60%=1 <50%=0 | Co-Wise External Average (G) | CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K) |
| C01 | 96 | 3 | 100 | 3 | 98.9 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO2 | ------ | ------ | 100 | 3 | 98.9 | 3 | | | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO3 | ------ | ----- | 100 | 3 | 98.9 | 3 | | | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO4 | ------ | ------ | ------ | ------ | 98.9 | 3 | | | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 98.9 | 3 | | | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 3** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) 3** |

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | **H(3)** | | | **H(3)** | | | **H(3)** | |
| 2 | | **H(3)** | | | | **H(3)** | | **H(3)** |
| 3 | **H(3)** | | **H(3)** | | **H(3)** | **H(3)** | | **H(3)** |
| 4 | **H(3)** | | | | | | | |
| 5 | **H(3)** | | **H(3)** | **H(3)** | | **H(3)** | | |
| Column (a) | **Average of Cos for PO1: 3** | **Average of Cos for PO2: 3** | **Average of Cos for PO3: 3** | **Average of Cos for PO4: 3** | **Average of Cos for PO5: 3** | **Average of Cos for PO6: 3** | **Average of Cos for PO7: 3** | **Average of Cos for PO8: 3** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X Total CO attainment For Entire Course value in table 2: 3** | **Average of PO2: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2: 3** | **Average of PO3: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2: 3** | **Average of PO4: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2: 3** | **Average of PO5: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2: 3** | **Average of PO6: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2: 3** | **Average of PO7: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2: 3** | **Average of PO8: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2: 3** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 3** | | | | | | | |

**COURSE TITLE: ELECTRONIC DEVICES AND CIRCUITS**
**COURSE CODE: CE18101**
**CREDITS: 4**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | **CO1: Define** and Classify the various electronic components | IV (Analyse) |
| **CO2** | CO2: **Explain** the functioning of electronic devices | III (Apply) |
| **CO3** | CO3: **Construct** and understand the functioning of BJT | V (Evaluate) |
| **CO4** | CO4: **Apply** the behaviour of transistor in building amplifier | III (Apply) |
| **CO5** | CO5: **Explain** the operation of amplifiers and oscillators | II(Understand) |

| **Course outcomes** | **Programme Outcomes** | | | | | | | | **Program Specific outcomes** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| 1 | | **H** | | | **H** | | | | | **H** | | | |
| 2 | | | **H** | | **H** | | | | | | **H** | | |
| 3 | | **H** | | | | **H** | | **H** | | | | **H** | |
| 4 | | | | **H** | | | **H** | | | **H** | | | |
| 5 | **H** | | | | | **H** | | | | | **H** | | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Co | WEEKLY | | MIDSEMESTER | | PRE-FINAL | | ASSIGNMENT | | VIVA | | | EXTERNAL EXAMS | | | |
| | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E) | Co-Wise Internal Average (Avg of A,B,C, D,E) (F) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 | Co-Wise External Average (G) | CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K) |
| C01 | 68 | 1 | 70 | 1 | 76 | 2 | 100 | 3 | 100 | 3 | 2 | 87 | 3 | 3 | 2.61 |
| CO2 | ------ | ------ | 70 | 1 | 76 | 2 | 100 | 3 | 100 | 3 | 2.25 | 87 | 3 | 3 | 2.70 |
| CO3 | ------ | ----- | 70 | 1 | 76 | 2 | 100 | 3 | 100 | 3 | 2.25 | 87 | 3 | 3 | 2.7 |
| CO4 | ------ | ------ | ------ | ------ | 76 | 2 | 100 | 3 | 100 | 3 | 2.86 | 87 | 3 | 3 | 2.82 |
| CO5 | ------ | ------ | ------ | ------ | 76 | 2 | 100 | 3 | 100 | 3 | 2.66 | 87 | 3 | 3 | 2.82 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 2.32** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) :2.72** |

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | | H(2.61) | | | H(2.61) | | | |
| 2 | | | H(2.70) | | H(2.70) | | | |
| 3 | | H(2.70) | | | | H(2.70) | | H(2.70) |
| 4 | | | | H(2.82) | | | H(2.82) | |
| 5 | H(2.82) | | | | | H(2.82) | | |
| Column (a) | **Average of Cos for PO1:2.82** | **Average of Cos for PO2:2.65** | **Average of Cos for PO3 :2.70** | **Average of Cos for PO4 :2.82** | **Average of Cos for PO5 :2.65** | **Average of Cos for PO6 :2.76** | **Average of Cos for PO7 :2.82** | **Average of Cos for PO8 :2.70** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X** Total CO attainment For Entire Course **value in table 2 :2.56** | **Average of PO2: [ (Column a)/ 3 X** Total CO attainment For Entire Course **value in table 2:2.32** | **Average of PO3: [ (Column a)/ 3 X** Total CO attainment For Entire Course **value in table 2:2.41** | **Average of PO4: [ (Column a)/ 3 X** Total CO attainment For Entire Course **value in table 2:2.78** | **Average of PO5: [ (Column a)/ 3 X** Total CO attainment For Entire Course **value in table 2:2.32** | **Average of PO6: [ (Column a)/ 3 X** Total CO attainment For Entire Course **value in table 2:2.32** | **Average of PO7: [ (Column a)/ 3 X** Total CO attainment For Entire Course **value in table 2:2.78** | **Average of PO8: [ (Column a)/ 3 X** Total CO attainment For Entire Course **value in table 2:2.41** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 2.54** | | | | | | | |

**COURSE TITLE: MATHEMATICS I**
**COURSE CODE: BS18101**
**CREDITS: 5**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field

| | | |
|---|---|---|
| **CO1** | **Categorize** the differential equations with respect to their order and linearity. Solve differential equations of first order using numerical and analytical methods such as Integrating Factors. | IV (Analyse) |
| **CO2** | **Analyze** and Solve basic application problems described by first order differential equations. Such orthogonal trajectories. | IV (Analyze) |
| **CO3** | **Solve** second order Homogeneous Equations with Constant Coefficients Obtain exact and numerical solutions using differential equations technology. | III (Apply) |
| **CO4** | **Combine** the necessary Laplace transform techniques to solve second-order ordinary differential equations. **Solve** the Laplace transform of standard functions. | VI (Create) |
| **CO5** | Analyze a Fourier series of a given periodic function by evaluating Fourier coefficients. | IV (Analyze) |

**TABLE 1: CO, PO, PSO MAPPING**

| **Course outcomes** | **Programme Outcomes** | | | | | | | | **Program Specific outcomes** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| 1 | **H** | | | **H** | | | **H** | **S** | | **H** | **H** | | **H** |
| 2 | | **H** | | | | **H** | | **H** | **H** | | **H** | | |
| 3 | **H** | | **H** | | | **H** | | **H** | | **H** | | **S** | **H** |
| 4 | **H** | **S** | | | | **H** | | | | | | **H** | **H** |
| 5 | **H** | | **H** | | **S** | **H** | | | | **H** | **S** | | **H** |

| | **INTERNAL ASSESSMENT (40%)** | | | | | | **EXTERNAL ASSESSMENT (60%)** | |
|---|---|---|---|---|---|---|---|---|
| Co | **WEEKLY** | **MIDSEMESTER** | **PRE-FINAL** | **ASSIGNMENT** | **VIVA** | | **EXTERNAL EXAMS** | |

| | PASS % | ATTAINMENT LEVEL >85%=3 85-75%=2 75-65%=1 <65%=0 (A) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%=2 75-65%=1 <65%=0 (B) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%=2 75-65%=1 <65%=0 (C) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%=2 75-65%=1 <65%=0 (E) | Co-Wise Internal Average (Avg of A,B,C,D,E) (F) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 | Co-Wise External Average (G) | CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 75 | 2 | 75 | 2 | 92.15 | 3 | 100 | 3 | 100 | 3 | 2.6 | 85 | 3 | 3 | 2.84 |
| CO2 | ------ | ------ | 75 | 2 | 92.15 | 3 | | | 100 | 3 | 2.6 | 85 | 3 | 3 | 2.84 |
| CO3 | ------ | ----- | 75 | 2 | 92.15 | 3 | | | 100 | 3 | 2.6 | 85 | 3 | 3 | 2.84 |
| CO4 | ------ | ------ | ------ | ------ | 92.15 | 3 | | | 100 | 3 | 3 | 85 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 92.15 | 3 | | | 100 | 3 | 3 | 85 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 2.75** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) :2.90** |

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | H(2.84) | | | H(2.84) | | | H(2.84) | |
| 2 | | H(2.84) | | | | H(2.84) | | H(2.84) |
| 3 | H(2.84) | | H(2.84) | | | H(2.84) | | H(2.84) |
| 4 | H(3) | | | | | H(3) | | |
| 5 | H(3) | | H(3) | | H(3) | H(3) | | |
| Column (a) | **Average of Cos for PO1:2.92** | **Average of Cos for PO2 :2.84** | **Average of Cos for PO3 :2.92** | **Average of Cos for PO4 :2.84** | **Average of Cos for PO5 :3** | **Average of Cos for PO6 :2.92** | **Average of Cos for PO7 :2.84** | **Average of Cos for PO8 :2.84** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X Total CO attainment For Entire Course value in table 2 :2.82** | **Average of PO2: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:2.74** | **Average of PO3: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:2.84** | **Average of PO4: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:2.74** | **Average of PO5: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:2.9** | **Average of PO6: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:2.82** | **Average of PO7: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:2.74** | **Average of PO8: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:2.74** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 2.79** | | | | | | | |

**COURSE TITLE: PROBLEM SOLVING AND PROGRAMMING IN C**
**COURSE CODE: CE18102**
**CREDITS: 4**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field

| | **COURSE OUTCOMES** | **BLOOM'S TAXONOMY LEVEL** |
|---|---|---|
| **CO1** | **CO1: Explain** the basic introduction of computer and programming languages. | III (Apply) |
| **CO2** | CO2: **Categorize** different data types, operators and data input /output functions in 'C'. | IV (Analyse) |
| **CO3** | CO3: **Develop** programs using 'C' control structures, arrays and string concept. | VI (Create) |
| **CO4** | CO4: **Sub divides** larger problems into smaller ones using 'C' functions. | IV (Analyse) |
| **CO5** | **CO5: Create** programs using the concept of structures, union and file handling in 'C'. | VI (Create) |

| **Course outcomes** | **Programme Outcomes** | | | | | | | | **Program Specific outcomes** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| 1 | **H** | | | | | | | | **H** | | **H** | | |
| 2 | | | **H** | | | | | | | | **H** | | |
| 3 | **H** | | **H** | **H** | | | | | | | **H** | | |
| 4 | | | | | | **H** | | | | | **H** | | |
| 5 | | | | **H** | | | | | | | **H** | | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **WEEKLY** | | **MIDSEMESTER** | | **PRE-FINAL** | | **ASSIGNMENT** | | **VIVA** | | | **EXTERNAL EXAMS** | | | |
| | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E)** | **Co-Wise Internal Average (Avg of A,B,C, D,E) (F)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0** | **Co-Wise External Average (G)** | **CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K)** |
| C01 | 74 | 1 | 81 | 2 | 86 | 3 | 100 | 3 | 100 | 3 | 2.4 | 81 | 2 | 2 | 1.78 |
| CO2 | ------ | ------ | 81 | 2 | 86 | 3 | 100 | 3 | 100 | 3 | 2.75 | 81 | 2 | 2 | 2.3 |
| CO3 | ------ | ----- | 81 | 2 | 86 | 3 | 100 | 3 | 100 | 3 | 2.75 | 81 | 2 | 2 | 2.3 |
| CO4 | ------ | ------ | ------ | ------ | 86 | 3 | 100 | 3 | 100 | 3 | 3 | 81 | 2 | 2 | 2.4 |
| CO5 | ------ | ------ | ------ | ------ | 86 | 3 | 100 | 3 | 100 | 3 | 3 | 81 | 2 | 2 | 2.4 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 2.54** | | | | | | | | | | | | | | **Total External Average (Avg of G): 2** | **Total CO attainment For Entire Course (Avg of K) :2.24** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | **H(1.78)** | | | | | | | |
| 2 | | | **H(2.3)** | | | | | |
| 3 | **H(2.3)** | | **H(2.3)** | **H(2.3)** | | | | |
| 4 | | | | | | **H(2.4)** | | |
| 5 | | | | **H(2.4)** | | | | |
| Column (a) | **Average of Cos for PO1:2.04** | **Average of Cos for PO2** | **Average of Cos for PO3 :2.3** | **Average of Cos for PO4 :2.35** | **Average of Cos for PO5** | **Average of Cos for PO6 :2.4** | **Average of Cos for PO7** | **Average of Cos for PO8** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X value in table 2 :1.52** | **Average of PO2: [ (Column a)/ 3 X value in table 2** | **Average of PO3: [ (Column a)/ 3 X value in table 2:1.72** | **Average of PO4: [ (Column a)/ 3 X value in table 2:1:75** | **Average of PO5: [ (Column a)/ 3 X value in table 2** | **Average of PO6: [ (Column a)/ 3 X value in table 2:1.8** | **Average of PO7: [ (Column a)/ 3 X value in table 2** | **Average of PO8: [ (Column a)/ 3 X value in table 2** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 1.7** | | | | | | | |

**Please leave the blank columns as they are. Do not put zero for empty columns. Take the average of only the number of items entered.**

**COURSE TITLE: ENGINEERING DRAWING AND ENGINEERING WORKSHOP**
**COURSE CODE: BS18029**
**CREDITS: 3**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering &Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning: Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.**

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | CO1: **Explain** the concept of drawing instruments and represent the lines used in the drawing | III (Apply) |
| **CO2** | CO2: **Construct** the different types of construction by selecting the type of construction | VI (Create) |
| **CO3** | CO3**: Differentiate** the drawing from each other, identify the problem, select the proper portion of the points, lines to solve the problem and to create the view by looking at the drawing like top, front and side view | IV (Analyze) |
| **CO4** | CO4: **Identify** and analyze systematically to solve it, and it helps to evaluate the problems to think differently. | IV (Analyze) |
| **CO5** | CO5: **Explain** the tools used and recognize the parts of the machine and remember the function of different tools and to understand the functioning of the workmen. | II (Understand) |

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| 1 | **H** | | | | | | | | | **H** | | | |
| 2 | | **H** | | | | | | | | **H** | | | |
| 3 | | **H** | | | | | | | | | | | **H** |
| 4 | | | **H** | | | | | | **H** | | | | |
| 5 | | | | | | **H** | | | | | **H** | | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **WEEKLY** | | **MIDSEMESTER** | | **PRE-FINAL** | | **ASSIGNMENT** | | **VIVA** | | | **EXTERNAL EXAMS** | | | |
| | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%=2 75-65%=1 <65%=0 (A)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%=2 75-65%=1 <65%=0 (B)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%=2 75-65%=1 <65%=0 (C)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%=2 75-65%=1 <65%=0 (E)** | **Co-Wise Internal Average (Avg of A,B,C, D,E) (F)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0** | **Co-Wise External Average (G)** | **CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K)** |
| C01 | | | | | 100 | 3 | | | | | 3 | 100 | 3 | 3 | 3 |
| CO2 | ------ | ------ | | | 100 | 3 | | | | | 3 | 100 | 3 | 3 | 3 |
| CO3 | ------ | ----- | | | 100 | 3 | | | | | 3 | 100 | 3 | 3 | 3 |
| CO4 | ------ | ------ | ------ | ------ | 100 | 3 | | | | | 3 | 100 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 100 | 3 | | | | | 3 | 100 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 3** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) 3** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | H(3) | | | | | | | |
| 2 | | H(3) | | | | | | |
| 3 | | H(3) | | | | | | |
| 4 | | | H(3) | | | | | |
| 5 | | | | | | H(3) | | |
| Column (a) | **Average of Cos for PO1 3** | **Average of Cos for PO2 3** | **Average of Cos for PO3 3** | **Average of Cos for PO4** | **Average of Cos for PO5** | **Average of Cos for PO6 3** | **Average of Cos for PO7** | **Average of Cos for PO8** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X Total CO attainment For Entire Course value in table 2 3** | **Average of PO2: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2: 3** | **Average of PO3: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 : 3** | **Average of PO4: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO5: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO6: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 : 3** | **Average of PO7: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO8: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 3** | | | | | | | |

**COURSE TITLE: GENERAL ENGLISH -II**
**COURSE CODE: EN18201**
**CREDITS: 3**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs :**

## B.Sc

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems**.**
- **PO2**. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4.Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5.Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOME ( DEPARTMENT WISE):**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | Distinguish between words which are either spelt or pronounced alike, yet render distinct meanings; imparting a sound clarity on everyday usage and miscommunications embedded in language Develop the art of parallel listening and writing; the art of swift, crisp and organized writing through note making | (III) Apply |
| **CO2** | Improve diction and gain understanding on the tense component, a pivotal constituent for language structuring. Transfer the data in pictorial or graphical representations to a textual format, in order to restate information in different forms in their present academic or future professional lives. | (IV) Analyze |
| **CO3** | Identify with economical word constructions, paying specific attention to vocabulary building in English. Construct their writing skills in writing formal letters and to design their curriculum vitae efficiently to venture into future job endeavours | (IV) Analyze |
| **CO4** | Interpret subject-verb agreement, the basic part involved in sentence constructing to improve their linguistic skills, Gain knowledge to plan technical and project reports for, writing responses to instructions for a person in authority, or for presenting a proposal to the clients. | (II) Understand |
| **CO5** | Extend their language efficiency through the grammar component of commonly confused and misspelt words, and errors related to vocabulary and different aspects of grammar, which would be seemingly helpful for language delivery. Cite varied sources of references, and become skilled at constructing a bibliography, an important piece of academic writing to acknowledge the author's debt to others, for facts and ideas a book or paper is built on. | (III) Apply |

**Loyola Academy, Alwal, Secunderabad 500 010**
**Table 1: CO, PO, PSO MAPPING**

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | P08 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| 1 | H | | S | H | | | | | H | S | | | |
| 2 | | H | | H | | | | | H | | | S | |
| 3 | | S | H | | | | | | H | | H | | |
| 4 | H | H | H | | | | | | S | | H | | |
| 5 | H | H | H | | | | | | | H | | | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO | WEEKLY | | MIDSEMESTER | | PRE-FINAL | | ASSIGNMENT | | VIVA | | | EXTERNAL EXAMS | | | |
| | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E) | Co-Wise Internal Average (Avg of A,B,C, D,E) (F) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 | Co-Wise External Average (G) | CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K) |
| C01 | 95 | 3 | 96 | 3 | 97 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO2 | ------ | ------ | 96 | 3 | 97 | 3 | --- | | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO3 | ------ | ----- | 96 | 3 | 97 | 3 | ---- | | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO4 | ------ | ------ | ------ | ------ | 97 | 3 | ---- | | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 97 | 3 | ----- | | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 3** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K): 3** |

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | | **H (3)** | | **H (3)** | | | | **H (3)** |
| 2 | **H (3)** | | **H (3)** | | | **H (3)** | | |
| 3 | | **H (3)** | | | **H (3)** | | | **H (3)** |
| 4 | **H (3)** | | | | **H (3)** | | **H (3)** | |
| 5 | **H (3)** | | **H (3)** | | | **H (3)** | | |
| Column (a) | **Average of Cos for PO1 3** | **Average of Cos for PO2 3** | **Average of Cos for PO3 3** | **Average of Cos for PO4 3** | **Average of Cos for PO5 3** | **Average of Cos for PO6 3** | **Average of Cos for PO7 3** | **Average of Cos for PO8 3** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X Total CO attainment For Entire Course value in table 2 3** | **Average of PO2: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 3** | **Average of PO3: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 3** | **Average of PO4: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 3** | **Average of PO5: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 3** | **Average of PO6: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 3** | **Average of PO7: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 3** | **Average of PO8: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 3** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 3** | | | | | | | |

**COURSE TITLE: INDIAN HERITAGE AND CULTURE**
**COURSE CODE: IC18001**
**CREDITS: 2**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs :**

## B.Sc

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems**.**
- **PO2**. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4.Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5.Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOME ( DEPARTMENT WISE):**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modeling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | **CO 1:** understand better about the origin of ancient Indian culture and the contributions of great rulers from both north and south India for Indian culture in ancient days. | Understand |
| **CO2** | **CO 2:** Analyze how Persian culture entered into India and how it influenced the Fine Arts of Indian society like Classical Music, Dance and Architecture. | Analyze |
| **CO3** | **CO 3:** Assess how the Indian orthodox society turn into modern and western society in the 19th century It also edifies the students with spiritual doctrines of various Religions. | Assess |
| **CO4** | **CO 4:** Evaluate various challenges face by the youth and the evil affects of terrorism on society | Evaluate |
| **CO5** | **CO 5:** The topics in the unit create belongingness among the students by bringing awareness of the rights and duties to make the world a better place and it throw light on gender sensitization issues of women, Children and LGBT | Create |

| **Course outcomes** | **Programme Outcomes** | | | | | | | | **Program Specific outcomes** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| 1 | **H** | | | **H** | | | **H** | **S** | | **H** | **H** | | |
| 2 | | **H** | | | | **H** | | **H** | **H** | | **H** | | |
| 3 | **H** | | **H** | | **H** | **H** | | **H** | | **H** | | **S** | |
| 4 | **H** | **S** | | | | | | | | | | **H** | |
| 5 | **H** | | **H** | **H** | **S** | **H** | | | | **H** | **S** | | |

| co | WEEKLY | | MIDSEMESTER | | PRE-FINAL | | ASSIGNMENT | | VIVA | | | EXTERNAL EXAMS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PASS%** | **ATTAINMENT LEVEL 70%>=3 60-70%= 2 50-60%=1 <50%=0 (A)** | **PASS%** | **ATTAINMENT LEVEL 70%>=3 60-70%= 2 50-60%=1 <50%=0 (B)** | **PASS%** | **ATTAINMENT LEVEL 70%>=3 60-70%= 2 50-60%=1 <50%=0 (C)** | **PASS%** | **ATTAINMENT LEVEL 70%>=3 60-70%= 2 50-60%=1 <50%=0 (D)** | **PASS%** | **ATTAINMENT LEVEL 70%>=3 60-70%= 2 50-60%=1 <50%=0 (E)** | **Co-Wise Internal Average (F)** | **PASS%** | **ATTAINMENT LEVEL 70%>=3 60-70% = 2 50-60% =1 <50 %=0** | **Co-Wise External Average (G)** | **CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K)** |
| C01 | ------ | ------- | 98.0 | 3 | 98.0 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO2 | ------ | ------ | 98.0 | 3 | 98 | 3 | | | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO3 | ------ | ----- | 98 | 3 | 98.0 | 3 | | | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO4 | ------ | ------ | ------ | ------ | 98.0 | 3 | | | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 98.0 | 3 | | | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 3** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **3 Total CO attainment For Entire Course (Avg of K)** |

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | **H(3)** | | | **H(3)** | | | **H(3)** | |
| 2 | | **H(3)** | | | | **H(3)** | | **H(3)** |
| 3 | **H(3)** | | **H(3)** | | **H(3)** | **H(3)** | | **H(3)** |
| 4 | **H(3)** | | | | | | | |
| 5 | **H(3)** | | **H(3)** | **H(3)** | | **H(3)** | | |
| Column (a) | **Average of Cos for PO1: 3** | **Average of Cos for PO2: 3** | **Average of Cos for PO3: 3** | **Average of Cos for PO4: 3** | **Average of Cos for PO5: 3** | **Average of Cos for PO6: 3** | **Average of Cos for PO7: 3** | **Average of Cos for PO8: 3** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X value in table 2: 3** | **Average of PO2: [ (Column a)/ 3 X value in table 2: 3** | **Average of PO3: [ (Column a)/ 3 X value in table 2: 3** | **Average of PO4: [ (Column a)/ 3 X value in table 2: 3** | **Average of PO5: [ (Column a)/ 3 X value in table 2: 3** | **Average of PO6: [ (Column a)/ 3 X value in table 2: 3** | **Average of PO7: [ (Column a)/ 3 X value in table 2: 3** | **Average of PO8: [ (Column a)/ 3 X value in table 2: 3** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 3** | | | | | | | |

**COURSE TITLE: LOGIC AND DIGITAL CIRCUITS**
**COURSE CODE: CE18201**
**CREDITS: 4**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**

**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering&Technology fundamentals to solve the complex problems.
- **PO2**. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3**.**Problem analysis**: Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4**. **Modern tool usage**: Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5**. **Environment and sustainability**: Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6**.**Individual and team work**: Function objectively as an individual and as a member in diverse teams.
- **PO7**. **Communication**: Communicate effectively on complex science &technology activitieswith society at large and able to write effective reports and documentation.
- **PO8**. **Life-long learning**: Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**

**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | **Explain** the binary logic and switching circuits | III (Apply) |
| **CO2** | **Solve** Boolean algebra and Boolean functions | III (Apply) |
| **CO3** | **Design** Boolean functions using universal gates | VI (Create) |
| **CO4** | **Construct** the arithmetic circuits and digital comparators | VI (Create) |
| **CO5** | **Construct** and analyze the various combinational circuits | VI (Create) |

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| 1 | | **H** | **H** | | **H** | | | | | **H** | | | |
| 2 | | | **H** | | **H** | | | | | | **H** | | |
| 3 | | | | **H** | | **H** | | **H** | | | | **H** | |
| 4 | | | | | | | **H** | | | **H** | | | |
| 5 | **H** | | | | | | | | | | | | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **WEEKLY** | | **MIDSEMESTER** | | **PRE-FINAL** | | **ASSIGNMENT** | | **VIVA** | | | **EXTERNAL EXAMS** | | | |
| | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E)** | **Co-Wise Internal Average (Avg of A,B,C, D,E) (F)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0** | **Co-Wise External Average (G)** | **CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K)** |
| C01 | 70 | 1 | 71 | 1 | 77 | 2 | 100 | 3 | 100 | 3 | 2 | 95 | 3 | 3 | 2.61 |
| CO2 | ------ | ------ | 71 | 1 | 77 | 2 | 100 | 3 | 100 | 3 | 2.25 | 95 | 3 | 3 | 2.70 |
| CO3 | ------ | ----- | 71 | 1 | 77 | 2 | 100 | 3 | 100 | 3 | 2.25 | 95 | 3 | 3 | 2.71 |
| CO4 | ------ | ------ | ------ | ------ | 77 | 2 | 100 | 3 | 100 | 3 | 2.66 | 95 | 3 | 3 | 2.83 |
| CO5 | ------ | ------ | ------ | ------ | 77 | 2 | 100 | 3 | 100 | 3 | 2.66 | 95 | 3 | 3 | 2.82 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 2.32** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) :2.73** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | | H(2.61) | H(2.61) | | H(2.61) | | | |
| 2 | | | H(2.70) | | H(2.70) | | | |
| 3 | | | | H(2.71) | | H(2.71) | | H(2.71) |
| 4 | | | | | | | H(2.82) | |
| 5 | H(2.82) | | | | | | | |
| Column (a) | **Average of Cos for PO1:2.82** | **Average of Cos for PO2 2.61** | **Average of Cos for PO3 :2.65** | **Average of Cos for PO4 :2.71** | **Average of Cos for PO5 :2.65** | **Average of Cos for PO6 :2.71** | **Average of Cos for PO7 :2.82** | **Average of Cos for PO8 :2.71** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X value in table 2 :2.57** | **Average of PO2: [ (Column a)/ 3 X value in table 2:2.32** | **Average of PO3: [ (Column a)/ 3 X value in table 2:2.41** | **Average of PO4: [ (Column a)/ 3 X value in table 2:2.78** | **Average of PO5: [ (Column a)/ 3 X value in table 2:2.32** | **Average of PO6: [ (Column a)/ 3 X value in table 2:2.42** | **Average of PO7: [ (Column a)/ 3 X value in table 2: 2.78** | **Average of PO8: [ (Column a)/ 3 X value in table 2: 2.41** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 2.55** | | | | | | | |

**Please leave the blank columns as they are. Do not put zero for empty columns. Take the average of only the number of items entered.**

**COURSE TITLE:** PHYSICS
**COURSE CODE: BS18021**
**CREDITS: 4**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA)Or POs :**

## B.Sc.

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems**.**
- **PO2**. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4.Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5.Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOME ( DEPARTMENT WISE):**

**B.Sc. Computer Systems & Engineering.**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| CO1 | **Apply** Fundamental electromagnetic concepts for various applications including wireless and optical communications. | (III) Apply |
| CO2 | **Design** different applications of lasers and fibre optics in the field of industry, medical and telecommunications. | (IV) Analyze |
| CO3 | **Distinguish** the various crystalline materials and to understand the crystallographic techniques. | (II) Understand |
| CO4 | **Apply** concepts of wave and particle nature of material particles for various engineering applications. | (III) Apply |
| CO5 | **Develop** different devices with more efficiency using superconducting and nano materials. | (VI) Create |

**Table 1: CO, PO, PSO MAPPING**

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | P08 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| 1 | H | | S | H | | | | | H | S | | | |
| 2 | | H | | H | | | | | H | | | S | |
| 3 | | S | H | | | | | | H | | H | | |
| 4 | H | H | H | | | | | | S | | H | | |
| 5 | H | H | H | | | | | | | H | | | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **WEEKLY** | | **MIDSEMESTER** | | **PRE-FINAL** | | **ASSIGNMENT** | | **VIVA** | | | **EXTERNAL EXAMS** | | | |
| | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E)** | **Co-Wise Internal Average (Avg of A,B,C, D,E) (F)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0** | **Co-Wise External Average (G)** | **CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K)** |
| C01 | 97 | 3 | 82 | 2 | 91 | 3 | 100 | 3 | 100 | 3 | 2.8 | 100 | 3 | 3 | 2.9 |
| CO2 | ------ | ------ | 82 | 2 | 91 | 3 | --- | | 100 | 3 | 2.6 | 100 | 3 | 3 | 2.8 |
| CO3 | ------ | ----- | 82 | 2 | 91 | 3 | ---- | | 100 | 3 | 2.75 | 100 | 3 | 3 | 2.9 |
| CO4 | ------ | ------ | ------ | ------ | 91 | 3 | ---- | | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 91 | 3 | ----- | | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 2.83** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) 2.92** |

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | | **H (2.9)** | | **H (2.9)** | | | | **H (2.9)** |
| 2 | **H (2.8)** | | **H (2.8)** | | | **H (2.8)** | | |
| 3 | | **H (2.9)** | | | **H (2.9)** | | | **H (2.9)** |
| 4 | **H (3)** | | | | **H (3)** | | **H (3)** | |
| 5 | **H (3)** | | **H (3)** | | | **H (3)** | | |
| Column (a) | **Average of Cos for PO1 2.9** | **Average of Cos for PO2 2.9** | **Average of Cos for PO3 2.9** | **Average of Cos for PO4 2.9** | **Average of Cos for PO5 2.9** | **Average of Cos for PO6 2.9** | **Average of Cos for PO7 3** | **Average of Cos for PO8 2.9** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X Total CO attainment For Entire Course value in table 2 2.82** | **Average of PO2: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 2.82** | **Average of PO3: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 2.82** | **Average of PO4: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 2.82** | **Average of PO5: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 2.82** | **Average of PO6: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 2.82** | **Average of PO7: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 2.92** | **Average of PO8: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 2.82** |
| **TOTAL PO ATTAINMENT:** | **(Average of all values in Column (b): 2.77** | | | | | | | |

**COURSE TITLE: C++ AND DATA STRUCTURES**
**COURSE CODE: CE18202**
**CREDITS: 5**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering &Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences**.**
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development**.**
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning: Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.**

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | CO1: **Differentiate** between object-oriented programming and procedure-oriented programming. | IV (Analyse) |
| **CO2** | CO2: **Develop** programs using object oriented programming features. | VI (Create) |
| **CO3** | CO3: **Organize** the data using sorting and various linear data structures and determine the time complexity | V (Evaluate) |
| **CO4** | CO4: **Illustrate** non-linear data structures like trees, graph | III (Apply) |
| **CO5** | CO5: **Choose** appropriate data structures to represent data items in real world problems | III (Apply) |

| **Course outcomes** | **Programme Outcomes** | | | | | | | | **Program Specific outcomes** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| 1 | **H** | | | | | | | **H** | **H** | | | **H** | |
| 2 | | **H** | | **H** | | | | **H** | | | **H** | | |
| 3 | **H** | **H** | **H** | **H** | | | | | **H** | | **H** | | |
| 4 | **H** | **H** | **H** | **H** | | | | **H** | **H** | | **H** | | |
| 5 | **H** | **H** | **H** | **H** | | | | **H** | **H** | | **H** | | |

| CO | WEEKLY | | MIDSEMESTER | | PRE-FINAL | | ASSIGNMENT | | VIVA | | | EXTERNAL EXAMS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E) | Co-Wise Internal Average (Avg of A,B,C, D,E) (F) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 | Co-Wise External Average (G) | CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K) |
| C01 | 84 | 2 | 71 | 1 | 45 | 0 | 100 | 3 | 100 | 3 | 1.8 | 93 | 3 | 3 | 2.52 |
| CO2 | ------ | ------ | 71 | 1 | 45 | 0 | 100 | 3 | 100 | 3 | 1.75 | 93 | 3 | 3 | 2.5 |
| CO3 | ------ | ----- | 71 | 1 | 45 | 0 | 100 | 3 | 100 | 3 | 1.75 | 93 | 3 | 3 | 2.5 |
| CO4 | ------ | ------ | ------ | ------ | 45 | 0 | 100 | 3 | 100 | 3 | 2 | 93 | 3 | 3 | 2.6 |
| CO5 | ------ | ------ | ------ | ------ | 45 | 0 | 100 | 3 | 100 | 3 | 2 | 93 | 3 | 3 | 2.6 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 1.86** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) :2.544** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | H(2.52) | | | | | | | H(2.52) |
| 2 | | H(2.5) | | H(2.5) | | | | H(2.5) |
| 3 | H(2.5) | H(2.5) | H(2.5) | H(2.5) | | | | |
| 4 | H(2.6) | H(2.6) | H(2.6) | H(2.6) | | | | H(2.6) |
| 5 | H(2.6) | H(2.6) | H(2.6) | H(2.6) | | | | H(2.6) |
| Column (a) | **Average of Cos for PO1:2.56** | **Average of Cos for PO2 :2.55** | **Average of Cos for PO3 :2.57** | **Average of Cos for PO4 :2.55** | **Average of Cos for PO5** | **Average of Cos for PO6** | **Average of Cos for PO7** | **Average of Cos for PO8 :2.56** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X value in table 2 :2.17** | **Average of PO2: [ (Column a)/ 3 X value in table 2: 2.16** | **Average of PO3: [ (Column a)/ 3 X value in table 2:2.18** | **Average of PO4: [ (Column a)/ 3 X value in table 2:2.16** | **Average of PO5: [ (Column a)/ 3 X value in table 2** | **Average of PO6: [ (Column a)/ 3 X value in table 2** | **Average of PO7: [ (Column a)/ 3 X value in table 2** | **Average of PO8: [ (Column a)/ 3 X value in table 2:2.17** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 2.16** | | | | | | | |

**Please leave the blank columns as they are. Do not put zero for empty columns. Take the average of only the number of items entered.**

**COURSE TITLE: MATHEMATICS-II**
**COURSE CODE: BS18202**
**CREDITS: 5**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**

**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**

**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.

PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.

PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.

PSO4: Demonstrate proficiency in hardware and software installation and configuration

PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| CO1 | **Categorize** the vector-valued functions of a real variable and their curves, Gradient vector fields and constructing potentials. | IV (Analyze) |
| CO2 | **Analyze** the differential ideas of divergence, curl, and the Laplacian along with their physical interpretations. | IV (Analyze) |

| | | |
|---|---|---|
| **CO3** | **Use** the applications of Green's theorem in the plane, Gauss divergence theorem and Stake's theorem. | III (Apply) |
| **CO4** | **Formulate** the solution set of a system of linear equations. . | VI(Create) |
| **CO5** | **Solve** the characteristic polynomial, eigenvectors, Eigen values. | III (Apply) |

**TABLE 1: CO, PO, PSO MAPPING**

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | P08 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| 1 | H | | | H | | | H | S | | H | H | | |
| 2 | | H | | | | H | | H | H | | H | | |
| 3 | H | | H | | | H | | H | | H | | S | |
| 4 | H | S | | | | H | | | | | | H | |
| 5 | H | | H | | S | H | | | | H | S | | |

**H: Highly Supportive** **S: Supportive**

| | INTERNAL ASSESSMENT (40%) | | | | | | EXTERNAL ASSESSMENT (60%) | |
|---|---|---|---|---|---|---|---|---|
| CO | WEEKLY | MIDSEMESTER | PRE-FINAL | ASSIGNMENT | VIVA | | EXTERNAL EXAMS | |

| | PASS % | ATTAINMENT LEVEL >85%=3 85-75%=2 75-65%=1 <65%=0 (A) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%=2 75-65%=1 <65%=0 (B) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%=2 75-65%=1 <65%=0 (C) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%=2 75-65%=1 <65%=0 (E) | Co-Wise Internal Average (Avg of A,B,C,D,E) (F) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 | Co-Wise External Average (G) | CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C01 | 75 | 2 | 75 | 2 | 92.15 | 3 | 100 | 3 | 100 | 3 | 2.6 | 85 | 3 | 3 | 2.84 |
| CO2 | ------ | ------ | 75 | 2 | 92.15 | 3 | | | 100 | 3 | 2.6 | 85 | 3 | 3 | 2.84 |
| CO3 | ------ | ----- | 75 | 2 | 92.15 | 3 | | | 100 | 3 | 2.6 | 85 | 3 | 3 | 2.84 |
| CO4 | ------ | ------ | ------ | ------ | 92.15 | 3 | | | 100 | 3 | 3 | 85 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 92.15 | 3 | | | 100 | 3 | 3 | 85 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 2.75** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) :2.90** |

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | H(2.84) | | | H(2.84) | | | H(2.84) | |
| 2 | | H(2.84) | | | | H(2.84) | | H(2.84) |
| 3 | H(2.84) | | H(2.84) | | | H(2.84) | | H(2.84) |
| 4 | H(3) | | | | | H(3) | | |
| 5 | H(3) | | H(3) | | H(3) | H(3) | | |
| Column (a) | **Average of Cos for PO1: 2.92** | **Average of Cos for PO2 :2.84** | **Average of Cos for PO3 :2.92** | **Average of Cos for PO4 :2.84** | **Average of Cos for PO5:3** | **Average of Cos for PO6 :2.92** | **Average of Cos for PO7 :2.84** | **Average of Cos for PO8 :2.84** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X Total CO attainment For Entire Course value in table 2 :2.82** | **Average of PO2: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:2.74** | **Average of PO3: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:2.82** | **Average of PO4: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:2.74** | **Average of PO5: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:2.9** | **Average of PO6: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:2.82** | **Average of PO7: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:2.74** | **Average of PO8: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:2.74** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 2.79** | | | | | | | |

**COURSE TITLE: PC HARDWARE AND SOFTWARE INSTALLATION**
**COURSE CODE: GE18CE1T**
**CREDITS: 2**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modeling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | CO1: **Identify** the basic components of computers | IV (Analyse) |
| **CO2** | CO2: **Differentiate** between internal and external connectors | IV (Analyze) |
| **CO3** | CO3: **Analyze** different types of processors in market | IV (Analyze) |
| **CO4** | CO4: **Choose** RAM and Hard disk drives for a computer | III (Apply) |
| **CO5** | CO5: **Develop** skill to Assembly and Disassembly a system | VI (Create) |

| **Course outcomes** | **Programme Outcomes** | | | | | | | | **Program Specific outcomes** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| 1 | **H** | | | | | | | **H** | **H** | | | **H** | |
| 2 | | | **H** | | | | | **H** | **H** | | **H** | | |
| 3 | **H** | | | | | | | **H** | **H** | **H** | | **H** | |
| 4 | **H** | | **H** | | | | | **H** | **H** | | | **H** | |
| 5 | **H** | | **H** | | | | | **H** | **H** | | **H** | | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **WEEKLY** | | **MIDSEMESTER** | | **PRE-FINAL** | | **ASSIGNMENT** | | **VIVA** | | | **EXTERNAL EXAMS** | | | |
| | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%=2 75-65%=1 <65%=0 (A)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%=2 75-65%=1 <65%=0 (B)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%=2 75-65%=1 <65%=0 (C)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%=2 75-65%=1 <65%=0 (E)** | **Co-Wise Internal Average (Avg of A,B,C, D,E) (F)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0** | **Co-Wise External Average (G)** | **CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K)** |
| C01 | 90 | 3 | 92 | 3 | 96 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 3 |
| CO2 | ------ | ------ | 92 | 3 | 96 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 3 |
| CO3 | ------ | ----- | 92 | 3 | 96 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 3 |
| CO4 | ------ | ------ | ------ | ------ | 96 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 96 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 3** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) :3** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | H(3) | | | | | | | H(3) |
| 2 | | | H(3) | | | | | H(3) |
| 3 | H(3) | | | | | | | H(3) |
| 4 | H(3) | | H(3) | | | | | H(3) |
| 5 | H(3) | | H(3) | | | | | H(3) |
| Column (a) | **Average of Cos for PO1:3** | **Average of Cos for PO2** | **Average of Cos for PO3 :3** | **Average of Cos for PO4 :3** | **Average of Cos for PO5** | **Average of Cos for PO6** | **Average of Cos for PO7** | **Average of Cos for PO8 :3** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X value in table 2:3** | **Average of PO2: [ (Column a)/ 3 X value in table 2** | **Average of PO3: [ (Column a)/ 3 X value in table 2:3** | **Average of PO4: [ (Column a)/ 3 X value in table 2** | **Average of PO5: [ (Column a)/ 3 X value in table 2** | **Average of PO6: [ (Column a)/ 3 X value in table 2** | **Average of PO7: [ (Column a)/ 3 X value in table 2** | **Average of PO8: [ (Column a)/ 3 X value in table 2:3** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 3** | | | | | | | |

**Please leave the blank columns as they are. Do not put zero for empty columns. Take the average of only the number of items entered.**

**COURSE TITLE: DISCRETE MATHEMATICS**
**COURSE CODE: BS18035**
**CREDITS: 5**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**

**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | **Develop** understanding of Logic Sets and Functions | ( Develop) |
| **CO2** | **Understand** Boolean algebra and basic properties of Boolean algebra; able to simplify simple Boolean functions by using the basic Boolean properties. | ( Understand) |
| **CO3** | **Develop** an understanding of how graph and tree concepts are used to solve problems arising in the computer science | ( Develop) |
| **CO4** | **Evaluate** and apply the fundamental concepts in graph theory | (Evaluate) |
| **CO5** | **Apply** graph theory based tools in solving practical problems. | ( Apply) |

| **Course outcomes** | **Programme Outcomes** | | | | | | | | **Program Specific Outcomes** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| 1 | **H** | | | **H** | | | **H** | **S** | | **H** | **H** | | |
| 2 | | **H** | | | | **H** | | **H** | **H** | | **H** | | |
| 3 | **H** | | **H** | | **H** | **H** | | **H** | | **H** | | **S** | |
| 4 | **H** | **S** | | | | | | | | | | **H** | |
| 5 | **H** | | **H** | **H** | **S** | **H** | | | | **H** | **S** | | |

| co | WEEKLY | | MIDSEMESTER | | PRE-FINAL | | ASSIGNMENT | | VIVA | | | EXTERNAL EXAMS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PASS % | ATTAINMENT LEVEL 70%>=3 60-70%= 2 50-60%=1 <50%=0 (A) | PASS% | ATTAINMENT LEVEL 70%>=3 60-70%=2 50-60%=1 <50%=0 (B) | PASS% | ATTAINMENT LEVEL 70%>=3 60-70%=2 50-60%=1 <50%=0 (C) | PASS% (choose the unit/CO from which assignment was given) | ATTAINMENT LEVEL 70%>=3 60-70%=2 50-60%=1 <50%=0 (D) | PASS% | ATTAINMENT LEVEL 70%>=3 60-70%=2 50-60%=1 <50%=0 (E) | Co-Wise Internal Average (F) | PASS % | ATTAINMENT LEVEL 70%>=3 60-70%=2 50-60%=1 <50%=0 | Co-Wise External Average (G) | CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K) |
| C01 | 96.7 | 3 | 100 | 3 | 98.3 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO2 | ------ | ------ | 100 | 3 | 98.3 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO3 | ------ | ----- | 100 | 3 | 98.3 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO4 | ------ | ------ | ------ | ------ | 98.3 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 98.3 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 3** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) 3** |

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | **H(3)** | | | **H(3)** | | | **H(3)** | |
| 2 | | **H(3)** | | | | **H(3)** | | **H(3)** |
| 3 | **H(3)** | | **H(3)** | | **H(3)** | **H(3)** | | **H(3)** |
| 4 | **H(3)** | | | | | | | |
| 5 | **H(3)** | | **H(3)** | **H(3)** | | **H(3)** | | |
| Column (a) | **Average of Cos for PO1: 3** | **Average of Cos for PO2: 3** | **Average of Cos for PO3: 3** | **Average of Cos for PO4: 3** | **Average of Cos for PO5: 3** | **Average of Cos for PO6: 3** | **Average of Cos for PO7: 3** | **Average of Cos for PO8: 3** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X Total CO attainment For Entire Course value in table 2: 3** | **Average of PO2: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2: 3** | **Average of PO3: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2: 3** | **Average of PO4: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2: 3** | **Average of PO5: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2: 3** | **Average of PO6: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2: 3** | **Average of PO7: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2: 3** | **Average of PO8: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2: 3** |
| **TOTAL PO ATTAINMENT :** | **(Average of all values in Column (b): 3** | | | | | | | |

**COURSE TITLE: IT HARDWARE AND NETWORKING**
**COURSE CODE: CE18301**
**CREDITS: 4**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | **Identify** Motherboard and its components. | IV (Analyse) |
| **CO2** | **Analyze** the working of various input and output devices | IV (Analyse) |
| **CO3** | **Explain** the working of various storage devices | II(Understand) |
| **CO4** | **Explain** Assembling and repairing of Desktop Computer with all its hardware components. | II(Understand) |
| **CO5** | **Identify** different types of networking devices | IV (Analyse) |

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | P08 | PSO1 | PSO2 | PSO3 | PSO4 | |
| 1 | H | | | H | | | | | H | | | H | |
| 2 | | | H | | | | | | H | | H | | |
| 3 | H | | | | | | | | H | H | | H | |
| 4 | H | | H | | | | | | H | | | H | |
| 5 | H | | H | | | | | | H | | H | | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **WEEKLY** | | **MIDSEMESTER** | | **PRE-FINAL** | | **ASSIGNMENT** | | **VIVA** | | | **EXTERNAL EXAMS** | | | |
| | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E)** | **Co-Wise Internal Average (Avg of A,B,C, D,E) (F)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0** | **Co-Wise External Average (G)** | **CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K)** |
| C01 | 95 | 3 | 92 | 3 | 92 | 3 | 100 | 3 | 100 | 3 | | 100 | 3 | 3 | 3 |
| CO2 | ------ | ------ | 92 | 3 | 92 | 3 | 100 | 3 | 100 | 3 | | 100 | 3 | 3 | 3 |
| CO3 | ------ | ----- | 92 | 3 | 92 | 3 | 100 | 3 | 100 | 3 | | 100 | 3 | 3 | 3 |
| CO4 | ------ | ------ | ------ | ------ | 92 | 3 | 100 | 3 | 100 | 3 | | 100 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 92 | 3 | 100 | 3 | 100 | 3 | | 100 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 3** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) :3** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | H(3) | | | H(3) | | | | |
| 2 | | | H(3) | | | | | |
| 3 | H(3) | | | | | | | |
| 4 | H(3) | | H(3) | | | | | |
| 5 | H(3) | | H(3) | | | | | |
| Column (a) | **Average of Cos for PO1: 3** | **Average of Cos for PO2** | **Average of Cos for PO3 :3** | **Average of Cos for PO4 :3** | **Average of Cos for PO5** | **Average of Cos for PO6** | **Average of Cos for PO7** | **Average of Cos for PO8** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X Total CO attainment For Entire Course value in table 2: 3** | **Average of PO2: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO3: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2: 3** | **Average of PO4: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2: 3** | **Average of PO5: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO6: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO7: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO8: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 3** | | | | | | | |

**Please leave the blank columns as they are. Do not put zero for empty columns. Take the average of only the number of items entered.**

**COURSE TITLE: DIGITAL SYSTEM DESIGN**
**COURSE CODE: CE18302**
**CREDITS: 3**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**B.Sc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering &Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| CO1 | **Explain** the functioning of sequential circuits | IV (Analyse) |
| CO2 | **Apply** the flip flops in constructing the counters and registers | III (Apply) |
| CO3 | **Explain** the arithmetic and logic micro operations | IV (Analyse) |
| CO4 | **Design** the arithmetic unit and logic unit | VI (Create) |
| CO5 | **Construct** and analyze the ALU | VI (Create) |

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | P08 | PSO1 | PSO2 | PSO3 | PSO4 | |
| 1 | | H | H | | H | | | | | H | | | |
| 2 | | | H | | H | | | | | | H | | |
| 3 | | | | H | | H | | H | | | | H | |
| 4 | | | | | | | H | | | H | | | |
| 5 | H | | | | | | | | | | | | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Co | WEEKLY | | MIDSEMESTER | | PRE-FINAL | | ASSIGNMENT | | VIVA | | | EXTERNAL EXAMS | | | |
| | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E) | Co-Wise Internal Average (Avg of A,B,C, D,E) (F) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 | Co-Wise External Average (G) | CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K) |
| C01 | 70 | 1 | 71 | 1 | 77 | 2 | 100 | 3 | 100 | 3 | 2 | 95 | 3 | 3 | 2.61 |
| CO2 | ------ | ------ | 71 | 1 | 77 | 2 | 100 | 3 | 100 | 3 | 2.25 | 95 | 3 | 3 | 2.70 |
| CO3 | ------ | ----- | 71 | 1 | 77 | 2 | 100 | 3 | 100 | 3 | 2.25 | 95 | 3 | 3 | 2.71 |
| CO4 | ------ | ------ | ------ | ------ | 77 | 2 | 100 | 3 | 100 | 3 | 2.66 | 95 | 3 | 3 | 2.83 |
| CO5 | ------ | ------ | ------ | ------ | 77 | 2 | 100 | 3 | 100 | 3 | 2.66 | 95 | 3 | 3 | 2.82 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 2.32** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K):2.73** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | | H(2.61) | H(2.61) | | H(2.61) | | | |
| 2 | | | H(2.70) | | H(2.70) | | | |
| 3 | | | | H(2.71) | | H(2.71) | | H(2.71) |
| 4 | | | | | | | H(2.82) | |
| 5 | H(2.82) | | | | | | | |
| Column (a) | **Average of Cos for PO1:2.82** | **Average of Cos for PO2 2.61** | **Average of Cos for PO3 :2.65** | **Average of Cos for PO4 :2.71** | **Average of Cos for PO5 :2.65** | **Average of Cos for PO6 :2.71** | **Average of Cos for PO7 :2.82** | **Average of Cos for PO8 :2.71** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X value in table 2 :2.57** | **Average of PO2: [ (Column a)/ 3 X value in table 2:2.32** | **Average of PO3: [ (Column a)/ 3 X value in table 2:2.41** | **Average of PO4: [ (Column a)/ 3 X value in table 2:2.78** | **Average of PO5: [ (Column a)/ 3 X value in table 2:2.32** | **Average of PO6: [ (Column a)/ 3 X value in table 2:2.42** | **Average of PO7: [ (Column a)/ 3 X value in table 2: 2.78** | **Average of PO8: [ (Column a)/ 3 X value in table 2: 2.41** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 2.55** | | | | | | | |

**Please leave the blank columns as they are. Do not put zero for empty columns. Take the average of only the number of items entered.**

**COURSE TITLE: JAVA PROGRAMMING**
**COURSE CODE: BS18036**
**CREDITS: 4**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | CO1: **Differentiate** between object-oriented programming and procedure-oriented programming | IV(Analyze) |
| **CO2** | CO2: **Apply** object-oriented programming features for solving a given problem. | III (Apply) |
| **CO3** | CO3: **Select** an appropriate exception handling depending on application. | IV (Analyze) |
| **CO4** | CO4: **Design** file operations using java standard library | VI (Create) |
| **CO5** | CO5: **Develop** interactive programs using applet and swing | VI (Create) |

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| 1 | **H** | | **H** | | | | | | | | **H** | | |
| 2 | **H** | | **H** | **H** | | | | | **H** | | **H** | | |
| 3 | | | **H** | **H** | | | | | **H** | | **H** | | |
| 4 | | **H** | | | | | | **H** | | **H** | **H** | | |
| 5 | | **H** | | **H** | | | | **H** | | **H** | **H** | | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **WEEKLY** | | **MIDSEMESTER** | | **PRE-FINAL** | | **ASSIGNMENT** | | **VIVA** | | | **EXTERNAL EXAMS** | | | |
| | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E)** | **Co-Wise Internal Average (Avg of A,B,C, D,E) (F)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0** | **Co-Wise External Average (G)** | **CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K)** |
| C01 | 96 | 3 | 89 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 3 | 87.5 | 3 | 3 | 3 |
| CO2 | ------ | ------ | 89 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 3 | 87.5 | 3 | 3 | 3 |
| CO3 | ------ | ----- | 89 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 3 | 87.5 | 3 | 3 | 3 |
| CO4 | ------ | ------ | ------ | ------ | 100 | 3 | 100 | 3 | 100 | 3 | 3 | 87.5 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 100 | 3 | 100 | 3 | 100 | 3 | 3 | 87.5 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 3** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) :3** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | H(3) | | H(3) | | | | | |
| 2 | H(3) | | H(3) | H(3) | | | | |
| 3 | | | H(3) | H(3) | | | | |
| 4 | | H(3) | | | | | | H |
| 5 | | H(3) | | H(3) | | | | H |
| Column (a) | **Average of Cos for PO1:3** | **Average of Cos for PO2:3** | **Average of Cos for PO3:3** | **Average of Cos for PO4:3** | **Average of Cos for PO5** | **Average of Cos for PO6** | **Average of Cos for PO7** | **Average of Cos for PO8 :3** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X value in table 2: 3** | **Average of PO2: [ (Column a)/ 3 X value in table 2: 3** | **Average of PO3: [ (Column a)/ 3 X value in table 2: 3** | **Average of PO4: [ (Column a)/ 3 X value in table 2: 3** | **Average of PO5: [ (Column a)/ 3 X value in table 2** | **Average of PO6: [ (Column a)/ 3 X value in table 2** | **Average of PO7: [ (Column a)/ 3 X value in table 2** | **Average of PO8: [ (Column a)/ 3 X value in table 2: 3** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 3** | | | | | | | |

**Please leave the blank columns as they are. Do not put zero for empty columns. Take the average of only the number of items entered.**

**COURSE TITLE: PROBABILITY AND STATISTICS**
**COURSE CODE: CE18401**
**CREDITS: 4**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**

**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | CO1: **Determine** the relation between any two factors using the concepts of correlation and regression and calculate the mean and variance for the random events. | VI (Create) |
| **CO2** | CO2: **Apply** the distributions both discrete and continuous for the problems in different fields and learn the importance of normal distribution and its applications in real life. | III (Apply) |
| **CO3** | CO3: **Differentiate** between different sampling techniques to be used in different situations and draw the inference based on the sample for a population when the sample size is large. | IV (Analyze) |
| **CO4** | CO4: **Compare** networking services | V (Evaluate) |
| **CO5** | CO5: **Plan** installation of required services in organization | VI (Create) |

| **Course outcomes** | **Programme Outcomes** | | | | | | | | **Program Specific outcomes** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| 1 | **H** | | | | | | | **H** | **H** | | | **H** | |
| 2 | | | | **H** | | | | **H** | | | **H** | | |
| 3 | **H** | | **H** | **H** | | | | | **H** | | **H** | | |
| 4 | | | **H** | **H** | | | | **H** | | | **H** | | |
| 5 | | | **H** | **H** | | | | **H** | | | **H** | | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Co | WEEKLY | | MIDSEMESTER | | PRE-FINAL | | ASSIGNMENT | | VIVA | | | EXTERNAL EXAMS | | | |
| | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E) | Co-Wise Internal Average (Avg of A,B,C, D,E) (F) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 | Co-Wise External Average (G) | CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K) |
| C01 | 69.76 | 1 | 65.21 | 1 | 39.58 | 0 | 100 | 3 | 100 | 3 | 1.6 | 85.41 | 3 | 3 | 2.44 |
| CO2 | ------ | ------ | 65.21 | 1 | 39.58 | 0 | 100 | 3 | 100 | 3 | 1.75 | 85.41 | 3 | 3 | 2.5 |
| CO3 | ------ | ----- | 65.21 | 1 | 39.58 | 0 | 100 | 3 | 100 | 3 | 1.75 | 85.41 | 3 | 3 | 2.5 |
| CO4 | ------ | ------ | ------ | ------ | 39.58 | 0 | 100 | 3 | 100 | 3 | 2 | 85.41 | 3 | 3 | 2.6 |
| CO5 | ------ | ------ | ------ | ------ | 39.58 | 0 | 100 | 3 | 100 | 3 | 2 | 85.41 | 3 | 3 | 2.6 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 1.82** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) 2.528** |

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | **H (2.44)** | | | | | | | **H(2.44)** |
| 2 | | | | **H(2.5)** | | | | **H(2.5)** |
| 3 | **H(2.5)** | | **H(2.5)** | **H(2.5)** | | | | |
| 4 | | | **H(2.6)** | **H(2.6)** | | | | **H(2.6)** |
| 5 | | | **H(2.6)** | **H(2.6)** | | | | **H(2.6)** |
| Column (a) | **Average of Cos for PO1 2.47** | **Average of Cos for PO2** | **Average of Cos for PO3 2.5666** | **Average of Cos for PO4 2.55** | **Average of Cos for PO5** | **Average of Cos for PO6** | **Average of Cos for PO7** | **Average of Cos for PO8 2.535** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X Total CO attainment For Entire Course value in table 2 2.0813** | **Average of PO2: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO3: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 2.1628** | **Average of PO4: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 2.1488** | **Average of PO5: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO6: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO7: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO8: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 2.1361** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 2.1323** | | | | | | | |

**COURSE TITLE: SERVER ADMINISTRATION**
**COURSE CODE: CE18402**
**CREDITS: 4**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | CO1: C**hoose** different editions of operating system | VI (Create) |
| **CO2** | CO2: **Organize** topologies in active directory | III (Apply) |
| **CO3** | CO3: **Compare** different services in active directory | IV (Analyze) |
| **CO4** | CO4: **Compare** networking services | V (Evaluate) |
| **CO5** | CO5: **Plan** installation of required services in organization | VI (Create) |

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| 1 | | **H** | | | | | | | **H** | | | | |
| 2 | | | | **H** | | | | | | **H** | | | |
| 3 | | | **H** | | | | | | | | | **H** | |
| 4 | | | | **H** | | | | | | | | | **H** |
| 5 | | | | **H** | | | | | | | | **H** | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Co | WEEKLY | | MIDSEMESTER | | PRE-FINAL | | ASSIGNMENT | | VIVA | | | EXTERNAL EXAMS | | | |
| | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E) | Co-Wise Internal Average (Avg of A,B,C, D,E) (F) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 | Co-Wise External Average (G) | CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K) |
| C01 | 95 | 3 | 92 | 3 | 92 | 3 | 100 | 3 | 100 | 3 | 100 | 96.3 | 3 | 3 | 3 |
| CO2 | ------ | ------ | 92 | 3 | 92 | 3 | 100 | 3 | 100 | 3 | 100 | 96.3 | 3 | 3 | 3 |
| CO3 | ------ | ----- | 92 | 3 | 92 | 3 | 100 | 3 | 100 | 3 | 100 | 96.3 | 3 | 3 | 3 |
| CO4 | ------ | ------ | ------ | ------ | 92 | 3 | 100 | 3 | 100 | 3 | 100 | 96.3 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 92 | 3 | 100 | 3 | 100 | 3 | 100 | 96.3 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 3** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) :3** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | | H(3) | | | | | | |
| 2 | | | | H(3) | | | | |
| 3 | | | H(3) | | | | | |
| 4 | | | | H(3) | | | | |
| 5 | | | | H(3) | | | | |
| Column (a) | **Average of Cos for PO1** | **Average of Cos for PO2 :3** | **Average of Cos for PO3 :3** | **Average of Cos for PO4 :3** | **Average of Cos for PO5** | **Average of Cos for PO6** | **Average of Cos for PO7** | **Average of Cos for PO8** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO2: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO3: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO4: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO5: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO6: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO7: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO8: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 3** | | | | | | | |

**Please leave the blank columns as they are. Do not put zero for empty columns. Take the average of only the number of items entered.**

**COURSE TITLE: COMPUTER ORGANIZATION**
**COURSE CODE: CE18403**
**CREDITS: 3**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | CO1: **Demonstrate** knowledge of register organization of a basic computer system | II (Understand) |
| **CO2** | CO2: **Explain** machine language of a basic computer system. | III (Apply) |
| **CO3** | CO3: **Appraise** in-depth understanding of control unit organization and micro programmed control. | V (Evaluate) |
| **CO4** | CO4: **Apply** various algorithms to perform arithmetic operations and propose suitable hardware for them. | III (Apply) |
| **CO5** | CO5: **Analyze** and emphasize various communication media in the basic computer system using design of various memory structures | IV (Analyze) |

| **Course outcomes** | **Programme Outcomes** | | | | | | | | **Program Specific outcomes** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| 1 | **H** | | | | | | | | **H** | | | | |
| 2 | | | **H** | | | | | | | | | | |
| 3 | | | **H** | **H** | | | | | | | **H** | | |
| 4 | | **H** | **H** | **H** | | | | | | | | **H** | |
| 5 | | | **H** | **H** | | | | | | **S** | | | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Co | WEEKLY | | MIDSEMESTER | | PRE-FINAL | | ASSIGNMENT | | VIVA | | | EXTERNAL EXAMS | | | |
| | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E) | Co-Wise Internal Average (Avg of A,B,C, D,E) (F) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 | Co-Wise External Average (G) | CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K) |
| C01 | 63.1 | 1 | 81 | 2 | 100 | 3 | 100 | 3 | 100 | 3 | 2.4 | 93 | 3 | 3 | 2.7 |
| CO2 | ------ | ------ | 81 | 2 | 100 | 3 | 100 | 3 | 100 | 3 | 2.7 | 93 | 3 | 3 | 2.9 |
| CO3 | ------ | ----- | 81 | 2 | 100 | 3 | 100 | 3 | 100 | 3 | 2.7 | 93 | 3 | 3 | 2.9 |
| CO4 | ------ | ------ | ------ | ------ | 100 | 3 | 100 | 3 | 100 | 3 | 3 | 93 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 100 | 3 | 100 | 3 | 100 | 3 | 3 | 93 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]:** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) :2.8** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | H(2.5) | | | | | | | |
| 2 | | | H(2.9) | | | | | |
| 3 | | | H(2.7) | H(2.9) | | | | |
| 4 | | H(3) | H(3) | H(3) | | | | |
| 5 | | | H(.27) | H(3) | | | | |
| Column (a) | **Average of Cos for PO1 2.5** | **Average of Cos for PO2 3** | **Average of Cos for PO3 2.825** | **Average of Cos for PO4 :2.96** | **Average of Cos for PO5** | **Average of Cos for PO6** | **Average of Cos for PO7** | **Average of Cos for PO8** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X value in table 2 :2.5** | **Average of PO2: [ (Column a)/ 3 X value in table 2: 2.61** | **Average of PO3: [ (Column a)/ 3 X value in table 2: 2.85** | **Average of PO4: [ (Column a)/ 3 X value in table 2: 2.81** | **Average of PO5: [ (Column a)/ 3 X value in table 2** | **Average of PO6: [ (Column a)/ 3 X value in table 2** | **Average of PO7: [ (Column a)/ 3 X value in table 2** | **Average of PO8: [ (Column a)/ 3 X value in table 2** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 2.69** | | | | | | | |

**Please leave the blank columns as they are. Do not put zero for empty columns. Take the average of only the number of items entered.**

**COURSE TITLE: OPERATING SYSTEMS**
**COURSE CODE: BS18030**
**CREDITS: 4**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**

**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | CO1: **Explain** functions, types and structures of operating system | III (Apply) |
| **CO2** | CO2: **Analyze** various process management concepts including scheduling and synchronization | IV (Analyze) |
| **CO3** | CO3: **Illustrate** the concepts of memory management and I/O system. | II (Understand) |
| **CO4** | CO4: **Solve** issues related to file system interface. | III (Apply) |
| **CO5** | CO5: **Choose** an appropriate Page replacement algorithm | VI (Create) |

| **Course outcomes** | **Programme Outcomes** | | | | | | | | **Program Specific outcomes** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| 1 | **H** | | **H** | | | | | | **H** | **H** | | | |
| 2 | | | **H** | | **H** | | | | | | **H** | | **H** |
| 3 | | **H** | | **H** | | | | | **H** | | **H** | | |
| 4 | | **H** | **H** | **H** | | | | | | **H** | | **H** | |
| 5 | | | | **H** | | | **H** | | **H** | | **H** | | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **WEEKLY** | | **MIDSEMESTER** | | **PRE-FINAL** | | **ASSIGNMENT** | | **VIVA** | | | **EXTERNAL EXAMS** | | | |
| | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E)** | **Co-Wise Internal Average (Avg of A,B,C, D,E) (F)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0** | **Co-Wise External Average (G)** | **CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K)** |
| C01 | 74.3 | 1 | 75 | 2 | 100 | 3 | 100 | 3 | 100 | 3 | 2.4 | 3 | 3 | 3 | 2.7 |
| CO2 | ------ | ------ | 75 | 2 | 100 | 3 | 100 | 3 | 100 | 3 | 2.7 | 3 | 3 | 3 | 2.9 |
| CO3 | ------ | ----- | 75 | 2 | 100 | 3 | 100 | 3 | 100 | 3 | 2.7 | 3 | 3 | 3 | 2.9 |
| CO4 | ------ | ------ | ------ | ------ | 100 | 3 | 100 | 3 | 100 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 100 | 3 | 100 | 3 | 100 | 3 | 3 | 3 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 2.76** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) :2.9** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | H(2.7) | | H(2.7) | | | | | |
| 2 | | | H(2.9 | | H(2.9) | | | |
| 3 | | H(2.9) | | H(2.9) | | | | |
| 4 | | H(3) | H(3) | H(3) | | | | |
| 5 | | | | H(3) | | | H(3) | |
| Column (a) | **Average of Cos for PO1:2.7** | **Average of Cos for PO2 :2.95** | **Average of Cos for PO3 :2.86** | **Average of Cos for PO4 :2.96** | **Average of Cos for PO5 :2.9** | **Average of Cos for PO6** | **Average of Cos for PO7 :3** | **Average of Cos for PO8** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X value in table 2 :2.61** | **Average of PO2: [ (Column a)/ 3 X value in table 2: 2.851** | **Average of PO3: [ (Column a)/ 3 X value in table 2:2.76** | **Average of PO4: [ (Column a)/ 3 X value in table 2:2.86** | **Average of PO5: [ (Column a)/ 3 X value in table 2:2.8** | **Average of PO6: [ (Column a)/ 3 X value in table 2** | **Average of PO7: [ (Column a)/ 3 X value in table 2:2.9** | **Average of PO8: [ (Column a)/ 3 X value in table 2** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 2.79** | | | | | | | |

**Please leave the blank columns as they are. Do not put zero for empty columns. Take the average of only the number of items entered.**

**COURSE TITLE: MICROPROCESSORS AND APPLICATIONS**
**COURSE CODE: CE18404**
**CREDITS: 3**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | CO1: **Explain** the architecture of 8086 based micro computer | II (Understand) |
| **CO2** | CO2: **Develop** the assembly language programs for 8086 based micro computer | VI (Create) |
| **CO3** | CO3: **Develop** the interfacing circuits for 8086 based micro computer | VI (Create) |
| **CO4** | CO4: **Explain** 8086 based microcomputer interrupt mechanism | II (Understand) |
| **CO5** | CO5: **Use** 8086 based micro computer to explain serial communication | III (Apply) |

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| 1 | | **H** | **H** | | **H** | | | | | **H** | | | |
| 2 | | | **H** | | **H** | | | | | | **H** | | |
| 3 | | | | **H** | | **H** | | **H** | | | | **H** | |
| 4 | | | | | | | **H** | | | **H** | | | |
| 5 | **H** | | | | | | | | | | | | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **WEEKLY** | | **MIDSEMESTER** | | **PRE-FINAL** | | **ASSIGNMENT** | | **VIVA** | | | **EXTERNAL EXAMS** | | | |
| | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E)** | **Co-Wise Internal Average (Avg of A,B,C, D,E) (F)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0** | **Co-Wise External Average (G)** | **CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K)** |
| C01 | 70 | 1 | 71 | 1 | 77 | 2 | 100 | 3 | 100 | 3 | 2 | 95 | 3 | 3 | 2.61 |
| CO2 | ------ | ------ | 71 | 1 | 77 | 2 | 100 | 3 | 100 | 3 | 2.25 | 95 | 3 | 3 | 2.70 |
| CO3 | ------ | ----- | 71 | 1 | 77 | 2 | 100 | 3 | 100 | 3 | 2.25 | 95 | 3 | 3 | 2.71 |
| CO4 | ------ | ------ | ------ | ------ | 77 | 2 | 100 | 3 | 100 | 3 | 2.66 | 95 | 3 | 3 | 2.83 |
| CO5 | ------ | ------ | ------ | ------ | 77 | 2 | 100 | 3 | 100 | 3 | 2.66 | 95 | 3 | 3 | 2.82 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 2.32** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K):2.73** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | | H(2.61) | H(2.61) | | H(2.61) | | | |
| 2 | | | H(2.70) | | H(2.70) | | | |
| 3 | | | | H(2.71) | | H(2.71) | | H(2.71) |
| 4 | | | | | | | H(2.82) | |
| 5 | H(2.82) | | | | | | | |
| Column (a) | **Average of Cos for PO1:2.82** | **Average of Cos for PO2 2.61** | **Average of Cos for PO3 :2.65** | **Average of Cos for PO4 :2.71** | **Average of Cos for PO5 :2.65** | **Average of Cos for PO6 :2.71** | **Average of Cos for PO7 :2.82** | **Average of Cos for PO8 :2.71** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X value in table 2 :2.57** | **Average of PO2: [ (Column a)/ 3 X value in table 2:2.32** | **Average of PO3: [ (Column a)/ 3 X value in table 2:2.41** | **Average of PO4: [ (Column a)/ 3 X value in table 2:2.78** | **Average of PO5: [ (Column a)/ 3 X value in table 2:2.32** | **Average of PO6: [ (Column a)/ 3 X value in table 2:2.42** | **Average of PO7: [ (Column a)/ 3 X value in table 2: 2.78** | **Average of PO8: [ (Column a)/ 3 X value in table 2: 2.41** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 2.55** | | | | | | | |

**Please leave the blank columns as they are. Do not put zero for empty columns. Take the average of only the number of items entered.**

**COURSE TITLE: ELECTRICAL CIRCUITS AND MACHINES**
**COURSE CODE: CE18405**
**CREDITS: 3**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | CO1: **Analyze** the electrical circuits with help of KCL and KVL techniques**.** | IV(Analyze) |
| **CO2** | CO2: E**xplain** the operation of DC generator AND DC motor and analyze the Characteristics of DC generator **and DC Motor** | III (Apply) |
| **CO3** | CO3: **Analyze** the starting and speed control methods of DC motors. | IV(Analyze) |
| **CO4** | CO4: **Understand** to develop equivalent circuit and evaluate performance of transformers | II (Understand) |
| **CO5** | CO5: **Understand** the operation of various special machines. | II (Understand) |

| **Course outcomes** | **Programme Outcomes** | | | | | | | | **Program Specific outcomes** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| 1 | **H** | | | | | | | | **H** | | | | |
| 2 | | | | **H** | | | | | | | | | |
| 3 | | | | | | **H** | | | | **H** | | | |
| 4 | **H** | | | | | | | | | | | **H** | |
| 5 | **H** | | | | | | | | | | | **H** | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **WEEKLY** | | **MIDSEMESTER** | | **PRE-FINAL** | | **ASSIGNMENT** | | **VIVA** | | | **EXTERNAL EXAMS** | | | |
| | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E)** | **Co-Wise Internal Average (Avg of A,B,C, D,E) (F)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0** | **Co-Wise External Average (G)** | **CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K)** |
| C01 | 70 | 1 | 78 | 2 | 86 | 3 | 100 | 3 | 100 | 3 | 2.4 | 86 | 3 | 3 | 2.4 |
| CO2 | ------ | ------ | 78 | 2 | 86 | 3 | 100 | 3 | 100 | 3 | 2.75 | 86 | 3 | 3 | 2.9 |
| CO3 | ------ | ----- | 78 | 2 | 86 | 3 | 100 | 3 | 100 | 3 | 2.75 | 86 | 3 | 3 | 2.9 |
| CO4 | ------ | ------ | ------ | ------ | 86 | 3 | 100 | 3 | 100 | 3 | 3 | 86 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 86 | 3 | 100 | 3 | 100 | 3 | 3 | 86 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 2.78** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) :2.84** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | **H(2.4)** | | | | | | | |
| 2 | | | | **H(2.9)** | | | | |
| 3 | | | | | | **H(2.9)** | | |
| 4 | **H(3)** | | | | | | | |
| 5 | **H(3)** | | | | | | | |
| Column (a) | **Average of Cos for PO1:2.8** | **Average of Cos for PO2** | **Average of Cos for PO3** | **Average of Cos for PO4 :2.9** | **Average of Cos for PO5** | **Average of Cos for PO6 :2.9** | **Average of Cos for PO7** | **Average of Cos for PO8** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X Total CO attainment For Entire Course value in table 2 :2.65** | **Average of PO2: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO3: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO4: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2: 2.75** | **Average of PO5: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO6: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:2.75** | **Average of PO7: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO8: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 2.72** | | | | | | | |

**Please leave the blank columns as they are. Do not put zero for empty columns. Take the average of only the number of items entered.**

**COURSE TITLE: SOFTWARE TESTING AND QUALITY**
**COURSE CODE: BS18044A**
**CREDITS: 4**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | **CO1: Express** importance of testing in software development process, glass-box testing, black-box testing, and how to report and analyze bugs | II (Understand) |
| **CO2** | CO2: **Design** different types of test case | VI (Create) |
| **CO3** | CO3: **Organize** how to build testing strategy, establishing software testing methodology and software testing techniques. | VI (Create) |
| **CO4** | CO4: **Identify** the definition of quality, metrics for software quality and inspection techniques. | IV (Analyse) |
| **CO5** | **CO5: Explain** software configuration management, software reengineering and software restructuring techniques. | III (Apply) |

| **Course outcomes** | **Programme Outcomes** | | | | | | | | **Program Specific outcomes** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| 1 | **H** | | **H** | | | | | **H** | | | **H** | | |
| 2 | | **H** | | | **H** | | | | **H** | | | | |
| 3 | | | | **H** | | **H** | | | | | **H** | | |
| 4 | | | **H** | **H** | | | **H** | | | | **H** | | |
| 5 | | **H** | | | | | | **H** | | | **H** | | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Co | WEEKLY | | MIDSEMESTER | | PRE-FINAL | | ASSIGNMENT | | VIVA | | | EXTERNAL EXAMS | | | |
| | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E) | Co-Wise Internal Average (Avg of A,B,C, D,E) (F) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 | Co-Wise External Average (G) | CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K) |
| C01 | 69 | 1 | 73 | 1 | 91 | 3 | 100 | 3 | 100 | 3 | 2.2 | 96 | 3 | 3 | 2.6 |
| CO2 | ------ | ------ | 73 | 1 | 91 | 3 | 100 | 3 | 100 | 3 | 2.5 | 96 | 3 | 3 | 2.8 |
| CO3 | ------ | ----- | 73 | 1 | 91 | 3 | 100 | 3 | 100 | 3 | 2.5 | 96 | 3 | 3 | 2.8 |
| CO4 | ------ | ------ | ------ | ------ | 91 | 3 | 100 | 3 | 100 | 3 | 3 | 96 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 91 | 3 | 100 | 3 | 100 | 3 | 3 | 96 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 2.64** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) 2.8** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | **H(2.6)** | | **H(2.6)** | | | | | **H(2.6)** |
| 2 | | **H(2.8)** | | | **H(2.8)** | | | |
| 3 | | | | **H(2.8)** | | **H(2.8)** | | |
| 4 | | | **H(3)** | **H(3)** | | | **H(3)** | |
| 5 | | **H(3)** | | | | | | **H(3)** |
| Column (a) | **Average of Cos for PO1 2.6** | **Average of Cos for PO2 2.9** | **Average of Cos for PO3 2.8** | **Average of Cos for PO4 2.9** | **Average of Cos for PO5 2.8** | **Average of Cos for PO6 2.8** | **Average of Cos for PO7 3** | **Average of Cos for PO8 2.8** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X Total CO attainment For Entire Course value in table 2 2.4** | **Average of PO2: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 2.7** | **Average of PO3: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 2.6** | **Average of PO4: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 2.7** | **Average of PO5: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 2.6** | **Average of PO6: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 2.6** | **Average of PO7: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 2.8** | **Average of PO8: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 2.6** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 2.6** | | | | | | | |

**COURSE TITLE: SOFTWARE ENGINEERING**
**COURSE CODE: BS18044B**
**CREDITS: 4**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | **CO1: Design** software through various process models. | VI (Create) |
| **CO2** | CO2: **Analyze** Object Oriented concepts and various Models. | IV (Analyse) |
| **CO3** | CO3: **Choose** different designs and architectures. | III (Apply) |
| **CO4** | CO4: **Explain** components, golden rules and design evaluation. | II (Understand) |
| **CO5** | **CO5: Select** testing techniques and determine its quality. | IV (Analyse) |

| **Course outcomes** | **Programme Outcomes** | | | | | | | | **Program Specific outcomes** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| 1 | | **H** | | | | **H** | | | **H** | | | | |
| 2 | | | **H** | | | | **S** | | | | **H** | | |
| 3 | | | **H** | **H** | | | | | **H** | **H** | **H** | **S** | |
| 4 | | | | | **H** | | | **H** | **H** | | | **H** | |
| 5 | **H** | | | **H** | | | | | **H** | | **H** | | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **WEEKLY** | | **MIDSEMESTER** | | **PRE-FINAL** | | **ASSIGNMENT** | | **VIVA** | | | **EXTERNAL EXAMS** | | | |
| | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E)** | **Co-Wise Internal Average (Avg of A,B,C, D,E) (F)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0** | **Co-Wise External Average (G)** | **CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K)** |
| C01 | 55 | 0 | 72 | 1 | 89 | 3 | 100 | 3 | 100 | 3 | 2 | 94 | 3 | 3 | 2.6 |
| CO2 | ------ | ------ | 72 | 1 | 89 | 3 | 100 | 3 | 100 | 3 | 2.5 | 94 | 3 | 3 | 2.8 |
| CO3 | ------ | ----- | 72 | 1 | 89 | 3 | 100 | 3 | 100 | 3 | 2.5 | 94 | 3 | 3 | 2.8 |
| CO4 | ------ | ------ | ------ | ------ | 89 | 3 | 100 | 3 | 100 | 3 | 3 | 94 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 89 | 3 | 100 | 3 | 100 | 3 | 3 | 94 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 2.6** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) :2.84** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | | H(2.6) | | | | H(2.6) | | |
| 2 | | | H(2.8) | | | | | |
| 3 | | | H(2.8) | H(2.8) | | | | |
| 4 | | | | | H(3) | | | H(3) |
| 5 | H(3) | | | H(3) | | | | |
| Column (a) | **Average of Cos for PO1:3** | **Average of Cos for PO2 :2.6** | **Average of Cos for PO3 2.8** | **Average of Cos for PO4 2.9** | **Average of Cos for PO5 :3** | **Average of Cos for PO6 :2.6** | **Average of Cos for PO7** | **Average of Cos for PO8 3** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X Total CO attainment For Entire Course value in table 2 :2.84** | **Average of PO2: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:2.46** | **Average of PO3: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:2.65** | **Average of PO4: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:2.74** | **Average of PO5: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO6: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:2.46** | **Average of PO7: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO8: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 2.73** | | | | | | | |

**Please leave the blank columns as they are. Do not put zero for empty columns. Take the average of only the number of items entered.**

**COURSE TITLE: ETHICAL HACKING**
**COURSE CODE: CE18501A**
**CREDITS: 4**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | CO1: **Explain** essential terminology and phases of hacking | III (Apply) |
| **CO2** | CO2: **Analyze** how to perform reconnaissance in various organizations | IV (Analyze) |
| **CO3** | CO3: **Identify** different types of scanning methods | IV (Analyze) |
| **CO4** | CO4: **Explain** the maintenance of access gained through hacking | III (Apply) |
| **CO5** | CO5: **Design** techniques used to avoid the traces of attacks in order to escape from the legal Punishment by a malicious hacker. | VI (Create) |

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | P08 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| 1 | | | | H | | | | H | | H | | | |
| 2 | H | H | | | | | | | H | | | | |
| 3 | H | | H | | | | | | | | H | | |
| 4 | | H | | H | | | | | | | H | H | |
| 5 | | | | H | | | | H | | H | | | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **WEEKLY** | | **MIDSEMESTER** | | **PRE-FINAL** | | **ASSIGNMENT** | | **VIVA** | | | **EXTERNAL EXAMS** | | | |
| | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E)** | **Co-Wise Internal Average (Avg of A,B,C, D,E) (F)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0** | **Co-Wise External Average (G)** | **CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K)** |
| C01 | 86.3 | 3 | 85 | 3 | 92 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO2 | ------ | ------ | 85 | 3 | 92 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO3 | ------ | ----- | 85 | 3 | 92 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO4 | ------ | ------ | ------ | ------ | 92 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 92 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 3** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) :3** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | | | | **H(3)** | | | | **H(3)** |
| 2 | **H(3)** | **H(3)** | | | | | | |
| 3 | **H(3)** | | **H(3)** | | | | | |
| 4 | | **H(3)** | | **H(3)** | | | | |
| 5 | | | | **H(3)** | | | | **H(3)** |
| Column (a) | **Average of Cos for PO1=2.88** | **Average of Cos for PO2 :2.87** | **Average of Cos for PO3 :2.87** | **Average of Cos for PO4 :3** | **Average of Cos for PO5** | **Average of Cos for PO6** | **Average of Cos for PO7** | **Average of Cos for PO8 :3** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X value in table 2 :3** | **Average of PO2: [ (Column a)/ 3 X value in table 2:3** | **Average of PO3: [ (Column a)/ 3 X value in table 2:2.75** | **Average of PO4: [ (Column a)/ 3 X value in table 2:3** | **Average of PO5: [ (Column a)/ 3 X value in table 2** | **Average of PO6: [ (Column a)/ 3 X value in table 2** | **Average of PO7: [ (Column a)/ 3 X value in table 2** | **Average of PO8: [ (Column a)/ 3 X value in table 2:3** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 3** | | | | | | | |

**Please leave the blank columns as they are. Do not put zero for empty columns. Take the average of only the number of items entered.**

**COURSE TITLE: PRINCIPLES OF INFORMATION SECURITY**
**COURSE CODE: CE18502**
**CREDITS: 4**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | CO1: **Explain** concepts of confidentiality, availability and integrity (CIA) in context of Information security | III(Apply) |
| **CO2** | CO2: **Identify** the risk, assess and risk control strategies. | IV (Analyze) |
| **CO3** | CO3: **Demonstrate** expertise in configuring host and network level technical security controls to include host firewalls, user access controls, host logging, network filtering, intrusion detection and prevention | II (Understand) |
| **CO4** | CO4: **Analyze** systems, tools, methods, and techniques for securing digital information within an organization | IV (Analyze) |
| **CO5** | CO5: **Develop** encryption and decryption techniques. | VI (Create) |

| **Course outcomes** | **Programme Outcomes** | | | | | | | | **Program Specific outcomes** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | |
| 1 | **H** | | | | | | | | | **H** | | | **H** | |
| 2 | | | | | | | **H** | | | | | | **H** | |
| 3 | **H** | **H** | | | | | | | | **H** | | | **H** | |
| 4 | **H** | **H** | | | | | | | | **H** | | | **H** | |
| 5 | **H** | | | | | | | | | **H** | | | **H** | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **WEEKLY** | | **MIDSEMESTER** | | **PRE-FINAL** | | **ASSIGNMENT** | | **VIVA** | | | **EXTERNAL EXAMS** | | | |
| | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E)** | **Co-Wise Internal Average (Avg of A,B,C, D,E) (F)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0** | **Co-Wise External Average (G)** | **CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K)** |
| C01 | 86 | 3 | 82 | 2 | 95 | 3 | 100 | 3 | 100 | 3 | 2.8 | 100 | 3 | 3 | 2.92 |
| CO2 | ------ | ------ | 82 | 2 | 95 | 3 | 100 | 3 | 100 | 3 | 2.8 | 100 | 3 | 3 | 2.92 |
| CO3 | ------ | ----- | 82 | 2 | 95 | 3 | 100 | 3 | 100 | 3 | 2.8 | 100 | 3 | 3 | 2.92 |
| CO4 | ------ | ------ | ------ | ------ | 95 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 95 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 2.88** | | | | | | | | | | | | | | **Total External Average (Avg of G): 2.88** | **Total CO attainment For Entire Course (Avg of K) :3** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | H(2.92) | | | | | | | |
| 2 | | | | | | | H(2.92) | |
| 3 | H(2.92) | H(2.92) | | | | | | |
| 4 | H(3) | H(3) | | | | | | |
| 5 | H(3) | | | | | | | |
| Column (a) | **Average of Cos for PO1 :2.96** | **Average of Cos for PO2 :2.96** | **Average of Cos for PO3** | **Average of Cos for PO4** | **Average of Cos for PO5** | **Average of Cos for PO6** | **Average of Cos for PO7 :2.92** | **Average of Cos for PO8** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X value in table 2 :2.96** | **Average of PO2: [ (Column a)/ 3 X value in table 2=2.96** | **Average of PO3: [ (Column a)/ 3 X value in table 2** | **Average of PO4: [ (Column a)/ 3 X value in table 2** | **Average of PO5: [ (Column a)/ 3 X value in table 2** | **Average of PO6: [ (Column a)/ 3 X value in table 2** | **Average of PO7: [ (Column a)/ 3 X value in table 2:2.92** | **Average of PO8: [ (Column a)/ 3 X value in table 2** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 2.95** | | | | | | | |

**Please leave the blank columns as they are. Do not put zero for empty columns. Take the average of only the number of items entered.**

**COURSE TITLE: DATABASE MANAGEMENT SYSTEMS**
**COURSE CODE: CE18503**
**CREDITS: 4**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | **CO1: Represent** logical database using Entity Relationship and Enhanced ER model. | II (Understand) |
| **CO2** | CO2: **Formulate** database using relational algebra and organize relation using normalization. | VI (Create) |
| **CO3** | CO3: **Design** SQL queries and implements PL/SQL. | VI (Create) |
| **CO4** | CO4: **Classify** the storage and file structure, storage access, indexing and hashing techniques of the database. | IV (Analyse) |
| **CO5** | **CO5: Explain** the concept of Transactions, recovery system and concurrency control. | III (Apply) |

| **Course outcomes** | **Programme Outcomes** | | | | | | | | **Program Specific outcomes** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| 1 | **H** | **H** | | | | | | | **S** | | **H** | | |
| 2 | | | **H** | | | | | | **S** | | **H** | | |
| 3 | | | | **H** | **H** | | | | **H** | | **H** | | |
| 4 | | **H** | **H** | | | | **H** | | **S** | | **H** | | |
| 5 | | | | | **H** | **H** | | **H** | | | **H** | | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **WEEKLY** | | **MIDSEMESTER** | | **PRE-FINAL** | | **ASSIGNMENT** | | **VIVA** | | | **EXTERNAL EXAMS** | | | |
| | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%=2 75-65%=1 <65%=0 (A)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%=2 75-65%=1 <65%=0 (B)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%=2 75-65%=1 <65%=0 (C)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%=2 75-65%=1 <65%=0 (E)** | **Co-Wise Internal Average (Avg of A,B,C, D,E) (F)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0** | **Co-Wise External Average (G)** | **CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K)** |
| C01 | 69 | 1 | 83 | 2 | 78 | 2 | 100 | 3 | 100 | 3 | 2.2 | 65 | 1 | 1 | 1.4 |
| CO2 | ------ | ------ | 83 | 2 | 78 | 2 | 100 | 3 | 100 | 3 | 2.5 | 65 | 1 | 1 | 1.6 |
| CO3 | ------ | ----- | 83 | 2 | 78 | 2 | 100 | 3 | 100 | 3 | 2.5 | 65 | 1 | 1 | 1.6 |
| CO4 | ------ | ------ | ------ | ------ | 78 | 2 | 100 | 3 | 100 | 3 | 2.6 | 65 | 1 | 1 | 1.6 |
| CO5 | ------ | ------ | ------ | ------ | 78 | 2 | 100 | 3 | 100 | 3 | 2.6 | 65 | 1 | 1 | 1.6 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 2.4** | | | | | | | | | | | | | | **Total External Average (Avg of G): 1** | **Total CO attainment For Entire Course (Avg of K) 1.5** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | H(1.4) | H(1.4) | | | | | | |
| 2 | | | H(1.6) | | | | | |
| 3 | | | | H(1.6) | H(1.6) | | | |
| 4 | | H(1.6) | H(1.6) | | | | H(1.6) | |
| 5 | | | | | H(1.6) | H(1.6) | | H(1.6) |
| Column (a) | **Average of Cos for PO1 1.4** | **Average of Cos for PO2 1.5** | **Average of Cos for PO3 1.6** | **Average of Cos for PO4 1.6** | **Average of Cos for PO5 1.6** | **Average of Cos for PO6 1.6** | **Average of Cos for PO7 1.6** | **Average of Cos for PO8 1.6** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X Total CO attainment For Entire Course value in table 2 0.7** | **Average of PO2: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 0.7** | **Average of PO3: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 0.8** | **Average of PO4: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 0.8** | **Average of PO5: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 0.8** | **Average of PO6: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 0.8** | **Average of PO7: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 0.8** | **Average of PO8: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2 0.8** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 0.7** | | | | | | | |

**COURSE TITLE: ADVANCED SERVER ADMINISTRATION**
**COURSE CODE: CE18504**
**CREDITS: 3**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | CO1: **Distinguish** and describe the windows server 2012 | IV (Analyze) |
| **CO2** | CO2: **Explain** directory services and configure DHCP sever | III (Apply) |
| **CO3** | CO3: **Identify** the prerequisites to install DNS service | IV (Analyze) |
| **CO4** | CO4: **Tell** about file services and do install WDS | VI (Create) |
| **CO5** | CO5: **Originate** the required services | VI (Create) |

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| 1 | | | | **H** | | | | **H** | | **H** | | | |
| 2 | **H** | **H** | | | | | | | **H** | | | | |
| 3 | **H** | | **H** | | | | | | | | **H** | | |
| 4 | | **H** | | **H** | | | | | | | **H** | **H** | |
| 5 | | | **H** | **H** | | | | **H** | | **H** | | | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **WEEKLY** | | **MIDSEMESTER** | | **PRE-FINAL** | | **ASSIGNMENT** | | **VIVA** | | | **EXTERNAL EXAMS** | | | |
| | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E)** | **Co-Wise Internal Average (Avg of A,B,C, D,E) (F)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0** | **Co-Wise External Average (G)** | **CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K)** |
| C01 | 86.3 | 3 | 85 | 3 | 92 | 3 | 100 | 3 | 100 | 3 | 3 | 95.6 | 3 | 3 | 3 |
| CO2 | ------ | ------ | 85 | 3 | 92 | 3 | 100 | 3 | 100 | 3 | 3 | 95.6 | 3 | 3 | 3 |
| CO3 | ------ | ----- | 85 | 3 | 92 | 3 | 100 | 3 | 100 | 3 | 3 | 95.6 | 3 | 3 | 3 |
| CO4 | ------ | ------ | ------ | ------ | 92 | 3 | 100 | 3 | 100 | 3 | 3 | 95.6 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 92 | 3 | 100 | 3 | 100 | 3 | 3 | 95.6 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 3** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) :3** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | | | | H(3) | | | | H(3) |
| 2 | H(3) | H(3) | | | | | | |
| 3 | H(3) | | H(3) | | | | | |
| 4 | | H(3) | | H(3) | | | | |
| 5 | | | H(3) | H(3) | | | | H(3) |
| Column (a) | **Average of Cos for PO1:3** | **Average of Cos for PO2 :3** | **Average of Cos for PO3 :3** | **Average of Cos for PO4 :3** | **Average of Cos for PO5** | **Average of Cos for PO6** | **Average of Cos for PO7** | **Average of Cos for PO8 :3** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X value in table 2 :3** | **Average of PO2: [ (Column a)/ 3 X value in table 2:3** | **Average of PO3: [ (Column a)/ 3 X value in table 2:3** | **Average of PO4: [ (Column a)/ 3 X value in table 2:3** | **Average of PO5: [ (Column a)/ 3 X value in table 2** | **Average of PO6: [ (Column a)/ 3 X value in table 2** | **Average of PO7: [ (Column a)/ 3 X value in table 2** | **Average of PO8: [ (Column a)/ 3 X value in table 2:3** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 3** | | | | | | | |

**Please leave the blank columns as they are. Do not put zero for empty columns. Take the average of only the number of items entered.**

**COURSE TITLE: COMPUTER NETWORKS**
**COURSE CODE: BS18047**
**CREDITS: 4**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | CO1: **Identify** basic computer network topologies and protocols and explain Data Communication System components | IV (Analyze) |
| **CO2** | CO2: **Classify** different error detecting techniques. | IV (Analyze) |
| **CO3** | CO3: C**onstruct** sub-netting and routing mechanisms. | VI (Create) |
| **CO4** | CO4: **Sketch** the routing protocols and analyze how to assign the IP addresses for the given network | III (Apply) |
| **CO5** | CO5: **Develop** network design and implementation | VI (Create) |

| **Course outcomes** | **Programme Outcomes** | | | | | | | | **Program Specific outcomes** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| 1 | **H** | | | | | | | **H** | **H** | | | | **H** |
| 2 | | | | **H** | | | | **H** | | **H** | **H** | | |
| 3 | **H** | | **H** | **H** | | | | | | | **H** | | **H** |
| 4 | | | **H** | **H** | | | | **H** | | **H** | | | **H** |
| 5 | | | **H** | **H** | | | | **H** | **H** | | | | **H** |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **WEEKLY** | | **MIDSEMESTER** | | **PRE-FINAL** | | **ASSIGNMENT** | | **VIVA** | | | **EXTERNAL EXAMS** | | | |
| | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E)** | **Co-Wise Internal Average (Avg of A,B,C, D,E) (F)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0** | **Co-Wise External Average (G)** | **CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K)** |
| C01 | 97.61 | 3 | 95.23 | 3 | 97.56 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO2 | ------ | ------ | 95.23 | 3 | 97.56 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO3 | ------ | ----- | 95.23 | 3 | 97.56 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO4 | ------ | ------ | ------ | ------ | 97.56 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 97.56 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 3.** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) :3** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | H(3) | | | | | | | H(3) |
| 2 | | | | H(3) | | | | H(3) |
| 3 | H(3) | | H(3) | H(3) | | | | |
| 4 | | | H(3) | H(3) | | | | H(3) |
| 5 | | | H(3) | H(3) | | | | H(3) |
| Column (a) | **Average of Cos for PO1:3** | **Average of Cos for PO2** | **Average of Cos for PO3:3** | **Average of Cos for PO4 :3** | **Average of Cos for PO5** | **Average of Cos for PO6** | **Average of Cos for PO7** | **Average of Cos for PO8 :3** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X Total CO attainment For Entire Course value in table 2 :3** | **Average of PO2: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO3: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2: 3** | **Average of PO4: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2: 3** | **Average of PO5: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO6: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO7: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO8: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2: 3** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 3** | | | | | | | |

**COURSE TITLE: INTERNET OF THINGS**
**COURSE CODE: CE18601B**
**CREDITS: 4**

**DEPARTMENT: B.Sc Computer Systems &Engineering**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| CO1 | CO1: Identify the importance of IOT and its applications | IV (Identify) |
| CO2 | CO2: Differentiate between IOT and M2M, SDN and NFV | IV (Differentiate) |
| CO3 | CO3: Apply logical design using python | III(Apply) |
| CO4 | CO4: Understand building of IOT devices and Raspberry PI | II(Understand) |
| CO5 | CO5: Explain the working of WAMP server and AWS | III( Explain) |

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | P08 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| 1 | H | | | | | | | | H | | | H | |
| 2 | | | | | | H | | | H | | | H | |
| 3 | | H | | | H | | | | H | | | H | |
| 4 | | | H | | | H | H | | H | | | H | |
| 5 | | | | H | | | | H | H | | | H | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **WEEKLY** | | **MIDSEMESTER** | | **PRE-FINAL** | | **ASSIGNMENT** | | **VIVA** | | | **EXTERNAL EXAMS** | | | |
| | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E)** | **Co-Wise Internal Average (Avg of A,B,C, D,E) (F)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0** | **Co-Wise External Average (G)** | **CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K)** |
| C01 | --- | --- | 90 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO2 | 86 | 3 | 90 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO3 | --- | --- | 90 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO4 | ---- | --- | --- | --- | 100 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO5 | --- | --- | ---- | --- | 100 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 3** | | | | | | | | | | | | | | **Total External Average (Avg of G):** | **Total CO attainment For Entire Course (Avg of K)** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | H(3) | | | | | | | |
| 2 | | | | | | H(3) | | |
| 3 | | H(3) | | | H(3) | | | |
| 4 | | | H(3) | | | H(3) | H(3) | |
| 5 | | | | H(3) | | | | H(3) |
| Column (a) | **Average of Cos for PO1:3** | **Average of Cos for PO2:3** | **Average of Cos for PO3 :3** | **Average of Cos for PO4 :3** | **Average of Cos for PO5 :3** | **Average of Cos for PO6 :3** | **Average of Cos for PO7 :3** | **Average of Cos for PO8 :3** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X Total CO attainment For Entire Course value in table 2 :3** | **Average of PO2: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO3: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO4: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO5: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO6: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO7: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO8: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 3** | | | | | | | |

**Please leave the blank columns as they are. Do not put zero for empty columns. Take the average of only the number of items entered.**

**COURSE TITLE:** CLOUD COMPUTING
**COURSE CODE: CE18601B**
**CREDITS: 4**

**DEPARTMENT: B.Sc. Computer Systems &Engineering**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | **CO1: Explain** the basic introduction of cloud computing | **III(Apply)** |
| **CO2** | **CO2: Categorize** different types of clouds | **IV (Analyse)** |
| **CO3** | **CO3: Develop** data centres using virtualization | **VI(Create)** |
| **CO4** | **CO4: Sub divides** large public cloud platforms into data centers and service centers | **IV (Analyse)** |
| **CO5** | **CO5: Create** data security and provide data security challenges | **VI(Create)** |

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | P08 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| 1 | H | | | | | | | H | H | | | H | |
| 2 | | | | H | | | | H | | | H | | |
| 3 | H | | H | H | | | | | H | | H | | |
| 4 | | | H | H | | | | H | | | H | | |
| 5 | | | H | H | | | | H | | | H | | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **WEEKLY** | | **MIDSEMESTER** | | **PRE-FINAL** | | **ASSIGNMENT** | | **VIVA** | | | **EXTERNAL EXAMS** | | | |
| | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E)** | **Co-Wise Internal Average (Avg of A,B,C, D,E) (F)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0** | **Co-Wise External Average (G)** | **CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K)** |
| C01 | 100 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 3 | 3 | 3 |
| CO2 | ------ | ------ | 100 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 3 | 3 | 3 |
| CO3 | ------ | ----- | 100 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 3 | 3 | 3 |
| CO4 | ------ | ------ | ------ | ------ | 100 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 100 | 3 | 100 | 3 | 100 | 3 | 100 | 3 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 3** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) :3** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | | H(2.76) | | | | | | H(2.76) |
| 2 | H(2.9) | | H(2.9) | | | | | |
| 3 | H(2.9) | | | H(2.9) | | | | |
| 4 | | | | H(2.87) | | | | |
| 5 | H(2.87) | | H(2.87) | | | | | |
| Column (a) | **Average of Cos for PO1: 2.89** | **Average of Cos for PO2 :2.76** | **Average of Cos for PO3 :2.88** | **Average of Cos for PO4 :2.88** | **Average of Cos for PO5** | **Average of Cos for PO6** | **Average of Cos for PO7** | **Average of Cos for PO8 :2.76** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X value in table 2: 2.76** | **Average of PO2: [ (Column a)/ 3 X value in table 2:2.63** | **Average of PO3: [ (Column a)/ 3 X value in table 2:2.75** | **Average of PO4: [ (Column a)/ 3 X value in table 2:2.75** | **Average of PO5: [ (Column a)/ 3 X value in table 2** | **Average of PO6: [ (Column a)/ 3 X value in table 2** | **Average of PO7: [ (Column a)/ 3 X value in table 2** | **Average of PO8: [ (Column a)/ 3 X value in table 2:2.63** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 2.704** | | | | | | | |

**Please leave the blank columns as they are. Do not put zero for empty columns. Take the average of only the number of items entered.**

**COURSE TITLE: CRYPTOGRAPHY AND NETWORK SECURITY**
**COURSE CODE: CE18602**
**CREDITS: 3**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | CO1**: Identify** information security goals, classical encryption techniques and acquire fundamental knowledge on the concepts of finite fields and number theory. | IV (Analyze) |
| **CO2** | CO2: **Apply Public Key Cryptographic Technique for securing messages** | III (Apply) |
| **CO3** | CO3: **Use** an appropriate message authentication code. | III (Apply) |
| **CO4** | CO4: **Compare** the performance of different message digest algorithms for verifying the integrity of varying message sizes | III (Apply) |
| **CO5** | CO5: **Compare** different IEEE standards and electronic mail security | IV (Analyze) |

| **Course outcomes** | **Programme Outcomes** | | | | | | | | **Program Specific outcomes** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| 1 | | **H** | | | | | | **H** | | **H** | | | |
| 2 | **H** | | **H** | | | | | | | **H** | **S** | | |
| 3 | **H** | | | **H** | | | | | | **H** | **S** | | |
| 4 | | | | **H** | | | | | | **S** | | **H** | |
| 5 | **H** | | **H** | | | | | | | | **H** | | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO | WEEKLY | | MIDSEMESTER | | PRE-FINAL | | ASSIGNMENT | | VIVA | | | EXTERNAL EXAMS | | | |
| | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E) | Co-Wise Internal Average (Avg of A,B,C, D,E) (F) | PASS % | ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 | Co-Wise External Average (G) | CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K) |
| C01 | 67 | 1 | 86 | 3 | 81 | 2 | 100 | 3 | 100 | 3 | 2.4 | 100 | 3 | 3 | 2.76 |
| CO2 | ------ | ------ | 86 | 3 | 81 | 2 | 100 | 3 | 100 | 3 | 2.75 | 100 | 3 | 3 | 2.9 |
| CO3 | ------ | ----- | 86 | 3 | 81 | 2 | 100 | 3 | 100 | 3 | 2.75 | 100 | 3 | 3 | 2.9 |
| CO4 | ------ | ------ | ------ | ------ | 81 | 2 | 100 | 3 | 100 | 3 | 2.67 | 100 | 3 | 3 | 2.87 |
| CO5 | ------ | ------ | ------ | ------ | 81 | 2 | 100 | 3 | 100 | 3 | 2.67 | 100 | 3 | 3 | 2.87 |
| TOTAL INTERNAL AVERAGE [Avg of all (F)]: 2.65 | | | | | | | | | | | | | | Total External Average (Avg of G): 3 | Total CO attainment For Entire Course (Avg of K) :2.86 |

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | **H(3)** | | | | | | | **H(3)** |
| 2 | | | | **H(3)** | | | | **H(3)** |
| 3 | **H(3)** | | **H(3)** | **H(3)** | | | | |
| 4 | | | **H(3)** | **H(3)** | | | | **H(3)** |
| 5 | | | **H(3)** | **H(3)** | | | | **H(3)** |
| Column (a) | **Average of Cos for PO1:3** | **Average of Cos for PO2** | **Average of Cos for PO3:3** | **Average of Cos for PO4:3** | **Average of Cos for PO5** | **Average of Cos for PO6** | **Average of Cos for PO7** | **Average of Cos for PO8:3** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X Total CO attainment For Entire Course value in table 2 :3** | **Average of PO2: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO3: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO4: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO5: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO6: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO7: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO8: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 3** | | | | | | | |

**COURSE TITLE: LINUX ADMINISTRATION**
**COURSE CODE: CE18603**
**CREDITS: 4**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | Describe the Installation of Linux and User, Group Administration, ACL | I (Understand) |
| **CO2** | Explain the configuration NFS, FTP and Send mail server | III (Apply) |
| **CO3** | Explain the configuration DHCP and SElinux | III (Apply) |
| **CO4** | Explain the configuration SAMBA and DNS server | III (Apply) |
| **CO5** | Explain the configuration Apache server , disk quotas | III (Apply) |

| Course outcomes | Programme Outcomes | | | | | | | | Program Specific outcomes | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | |
| 1 | | **H** | | | | | | | **H** | | | | | |
| 2 | | | | **H** | | | | | | **H** | | | | |
| 3 | | | **H** | | | | | | | | | **H** | | |
| 4 | | | | **H** | | | | | | | | | **H** | |
| 5 | | | | **H** | | | | | | | | **H** | | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **WEEKLY** | | **MIDSEMESTER** | | **PRE-FINAL** | | **ASSIGNMENT** | | **VIVA** | | | **EXTERNAL EXAMS** | | | |
| | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E)** | **Co-Wise Internal Average (Avg of A,B,C, D,E) (F)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0** | **Co-Wise External Average (G)** | **CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K)** |
| C01 | 95 | 3 | 96 | 3 | 98.3 | 3 | 100 | 3 | 100 | 3 | 100 | 100 | 3 | 3 | 3 |
| CO2 | ------ | ------ | 96 | 3 | 98.3 | 3 | 100 | 3 | 100 | 3 | 100 | 100 | 3 | 3 | 3 |
| CO3 | ------ | ----- | 96 | 3 | 98.3 | 3 | 100 | 3 | 100 | 3 | 100 | 100 | 3 | 3 | 3 |
| CO4 | ------ | ------ | ------ | ------ | 98.3 | 3 | 100 | 3 | 100 | 3 | 100 | 100 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 98.3 | 3 | 100 | 3 | 100 | 3 | 100 | 100 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 3** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) :3** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | | H(3) | | | | | | |
| 2 | | | | H(3) | | | | |
| 3 | | | H(3) | | | | | |
| 4 | | | | H(3) | | | | |
| 5 | | | | H(3) | | | | |
| Column (a) | **Average of Cos for PO1** | **Average of Cos for PO2 :3** | **Average of Cos for PO3 :3** | **Average of Cos for PO4 :3** | **Average of Cos for PO5** | **Average of Cos for PO6** | **Average of Cos for PO7** | **Average of Cos for PO8** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO2: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO3: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO4: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO5: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO6: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO7: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO8: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 3** | | | | | | | |

**Please leave the blank columns as they are. Do not put zero for empty columns. Take the average of only the number of items entered.**

**COURSE TITLE: WEB TECHNOLOGIES**
**COURSE CODE: CE18603**
**CREDITS: 4**

**DEPARTMENT: COMPUTER SYSTEMS AND ENGINEERING**

**PROGRAMME OUTCOMES(BA/BSC/BCOM and BBA):**
**BSc.**

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.
- **PO7. Communication:** Communicate effectively on complex science &technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):**
**Students will be able to:**

PSO1: Ability to apply the knowledge of computer system and design principles in building the software and hardware components.
PSO2: Ability to apply knowledge of layered network models, protocols, technologies and topologies as well as incorporating security policies for building network and internet based applications.
PSO3: Apply the theoretical foundations of computer science in modelling and developing solutions to the complex and real world problems as well as designing and developing the application software systems along with the database design and management that meet the automation needs of industry and society.
PSO4: Demonstrate proficiency in hardware and software installation and configuration
PSO5: Examine the elements supporting data communications and systems and Show how the various IT components interact to support the Network Communications Management field.

| | COURSE OUTCOMES | BLOOM'S TAXONOMY LEVEL |
|---|---|---|
| **CO1** | Illustrate basic html scripts to design web pages | I (Understand) |
| **CO2** | Explain about cascading style sheets | III (Apply) |
| **CO3** | Analyze java script programming using operators, expressions and functions | IV(Analyze) |
| **CO4** | Classify event handling in JavaScript and introduce XML | IV(Analyze) |
| **CO5** | Develop PHP programs and database connectivity through MYSQL | VI (Create) |

| **Course outcomes** | **Programme Outcomes** | | | | | | | | **Program Specific outcomes** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | |
| 1 | **H** | **H** | | | | | | | **H** | | **H** | | | |
| 2 | | **H** | | **H** | | | | | | **H** | **H** | | | |
| 3 | | **H** | **H** | | | | | | | | **H** | | **H** | |
| 4 | | **H** | | | | | **H** | | | **H** | | | **H** | |
| 5 | | | | **H** | | | **H** | | | | **H** | | **H** | |

| | INTERNAL ASSESSMENT (40%) | | | | | | | | | | | EXTERNAL ASSESSMENT (60%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **WEEKLY** | | **MIDSEMESTER** | | **PRE-FINAL** | | **ASSIGNMENT** | | **VIVA** | | | **EXTERNAL EXAMS** | | | |
| | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (A)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (B)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (C)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (D)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0 (E)** | **Co-Wise Internal Average (Avg of A,B,C, D,E) (F)** | **PASS %** | **ATTAINMENT LEVEL >85%=3 85-75%= 2 75-65%=1 <65%=0** | **Co-Wise External Average (G)** | **CO-WISE TOTAL AVERAGE (F)X 0.4+ (G) X 0.6 (K)** |
| C01 | 97.5 | 3 | 97.6 | 3 | 97.6 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO2 | ------ | ------ | 97.6 | 3 | 97.6 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO3 | ------ | ----- | 97.6 | 3 | 97.6 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO4 | ------ | ------ | ------ | ------ | 97.6 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| CO5 | ------ | ------ | ------ | ------ | 97.6 | 3 | 100 | 3 | 100 | 3 | 3 | 100 | 3 | 3 | 3 |
| **TOTAL INTERNAL AVERAGE [Avg of all (F)]: 3** | | | | | | | | | | | | | | **Total External Average (Avg of G): 3** | **Total CO attainment For Entire Course (Avg of K) :3** |

## Table 3: PROGRAMME OUTCOME MAPPING

| Course outcomes | Programme Outcomes | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **P08** |
| 1 | H(3) | H(3) | | | | | | H(3) |
| 2 | | H(3) | | H(3) | | | | |
| 3 | | H(3) | H(3) | | | | | |
| 4 | | H(3) | | | | | H(3) | |
| 5 | | | | H(3) | | | H(3) | |
| Column (a) | **Average of Cos for PO1:3** | **Average of Cos for PO2:3** | **Average of Cos for PO3 :3** | **Average of Cos for PO4 :3** | **Average of Cos for PO5** | **Average of Cos for PO6** | **Average of Cos for PO7 :3** | **Average of Cos for PO8** |
| Column (b) | **Average of PO1: [ (Column a) / 3 X Total CO attainment For Entire Course value in table 2 :3** | **Average of PO2: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO3: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO4: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO5: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO6: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** | **Average of PO7: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2:3** | **Average of PO8: [ (Column a)/ 3 X Total CO attainment For Entire Course value in table 2** |
| **TOTAL PO ATTAINMENT**: | **(Average of all values in Column (b): 3** | | | | | | | |

**Please leave the blank columns as they are. Do not put zero for empty columns. Take the average of only the number of items entered.**