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|---|---|---|---|---|---|
| **Title of Course:** | **:** | **Civil Engineering Drawing, Drafting and Interpretation (1 + 2)** | | | |
| **Course Code** | **:** | CET101 | | | |
| **Semester** | **:** | 1st Semester | | | |
| **Technology** | **:** | Civil Engineering Technology | | | |
| **Effective** | **:** | 24 – Batch | | | |
| **Pre-requisite** | **:** | Nil | | | |
| **Co-requisite** | **:** | Nil | | | |
| **Assessment** | **:** | **Theory** | | **Practical** | |
| | **:** | Quizzes/Test (s): 05 Marks<br>Assignments/Projects/Presentations: 05 Marks<br>Mid Semester Exam: 15 Marks<br>Final Semester Exam: 25 Marks | | Lab Rubrics: 30 %<br>Open Ended Lab/Mini Project: 20 % Final Exam; Objective Test*: 30 % Final Exam; Conduct of Practical/Viva Voce*: 20 %<br>*Appearance in Final Exams is mandatory | |
| **Credit Hours/week** | **:** | **Th** | 1 | **Pr** | 2 |
| **Minimum Contact Hours** | **:** | **Th** | 16 | **Pr** | 96 |
| **Marks** | **:** | **Th** | 50 | **Pr** | 100 |

**After Completing the Course, each student will be able to:**

| Sr. No. | Theory/ Practical | CLO | Taxonomy Level | PLO |
|---|---|---|---|---|
| 1 | Theory | Recognize basic principles of drafting in the fields of architectural, construction, civil, and transportation engineering. | C1 | 1 |
| 2 | Theory | Illustrate different civil engineering drawings. | C3 | 2 |
| 3 | Practical | Perform basic drafting techniques including line work, lettering, dimensioning, sketching, and drawings assembly. | P4 | 9 |
| 4 | Practical | Justify awareness for drawings of simple objects/structures. | A3 | 10 |

**Relevant Program Learning Outcomes (PLOs):**

**The course is designed so that students will achieve the following PLOs:**

| | | | | | |
|---|---|---|---|---|---|
| 1 | Engineering Knowledge | | 7 | Environment and Sustainability: | |
| 2 | Problem Analysis: | | 8 | Ethics: | |
| 3 | Design/Development of Solutions: | | 9 | Individual and Team Work: | |
| 4 | Investigation: | | 10 | Communication: | |
| 5 | Modern Tool Usage: | | 11 | Project Management: | |
| 6 | The Engineering Society: | | 12 | Lifelong Learning: | |

**OBJECTIVES:**

The objectives of a civil engineering drawing, drafting, and interpretation teaching course include:

1. Equipping students with proficiency in creating accurate drawings, understanding design principles, and effectively communicating technical information to stakeholders.
2. Students learn to apply drawing techniques, develop critical thinking skills to solve design problems.

**COURSE OUTLINE:**

**Drawing Basics:** Introduction to drawing of point and straight line**,** Elements of architectural planning and design, working drawings and details of residential, commercial, clinical, hospital, and educational buildings; Details of doors, windows, staircases, etc. Elements of structural drawing and detailing, preparation of foundation plan, slab details, staircase details, beam and column, elevations, and sections mostly pertaining to reinforced concrete structures. Plumbing and electrical detailing pertaining to residential units**.**

**Drawings Interpretation:** General understanding and reading of the following drawings: architectural and structural detail drawings of bridges (Concrete, Steel, etc.), Culverts, buildings, Retaining Walls (Gravity, Cantilever, etc.), Industrial Building, details of steel roof truss, connection details, and fabrication drawings.

**PRACTICAL WORK TO BE CARRIED OUT:**

1. Draw a Plan and section of isolated and combine footing showing reinforcement.
2. Draw a four storied Building Column's elevation and cut section at each floor reducing reinforcement and cross-section of column.
3. Draw Schedule of Beam also draw Typical Elevation of Beam, showing Bottom bar, Extra bottom bar, Hanger bar, Top bar, Extra Top bar, and rings.
4. Draw single span Beam Elevation and its Section showing reinforcement using bent up bar.
5. Draw a three span RCC Beam elevation and its section showing reinforcement.
6. Draw a Plan (13 X 17) and its X-section of single span RCC Slab, showing reinforcement. Short way #3@6"c/c , long way #3@9"c/c, Slab thickness 6"
7. Draw Plan and X-section of one-way slab of three spans showing reinforcement.
8. Draw Plan and X-section of Septic Tank.
9. Draw a Plan of 120 sq. yard residential bungalow.
10. Draw elevation and section of bridges showing the components of bridge like Pile, Pile cap, Abutment, Transom, Diaphragm.
11. Draw elevation and section of girder (R.C.C & Prestress) showing pre-stress & non prestress reinforcement.
12. Draw elevation, section, and reinforcement drawing of Culvert.
13. Draw elevation, section and reinforcement drawings of Cantilever Retaining Walls.
14. Draw Elevation, section and reinforcement drawing of Counterfort Retaining Walls
15. Draw general layout of an Airport showing typical x-section of runway.
16. Draw elevation and section of Jetties and Quay Walls.
17. Open ended lab.

**RECOMMENDED BOOKS:**


1. Technical Drawing By David L. Goetech, Wikkuan S.Chalk, John A.Nelson, Rymond L.Richman, Latest Edition
2. Fundamentals of Engineering Drawing: With an Introduction to Interactive Computer Graphics for Design and Production by Warren Jacob Luzadder, Jon M.Duff, Prentice-Hall Inc., New Jersey, Latest Edition
3. Engineering Drawing By N. D. Bhatt, CHAROTAR Publication, Latest Edition
4. Civil Engineering Drawing by R.S. Malik and G.S. Meo, Computech publications Limited, Latest Edition

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| Approval: | Industrial Advisory Board | Res No. 9.4 | Dated: 09/05/2024 |
| | Board of Studies | Res.No.2.3 | Dated: 29/05/2024 |
| | Board of Faculty | Res.No.3.1 | Dated: 19/08/2024 |
| | Academic Council | Res.No.108.3(ii) | Dated:31/10/2024 |

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|---|---|---|---|---|---|
| **Title of Course:** | **:** | **Applied Physics (2 + 1)** | | | |
| **Course Code** | **:** | CETN101 | | | |
| **Semester** | **:** | 1st | | | |
| **Technology** | **:** | Civil Engineering Technology | | | |
| **Effective** | **:** | 24 – Batch | | | |
| **Pre-requisite** | **:** | Nil | | | |
| **Co-requisite** | **:** | Nil | | | |
| **Assessment** | **:** | **Theory** | | **Practical** | |
| | **:** | Quizzes/Test (s): 05 Marks<br>Assignments/Projects/Presentations: 05 Marks<br>Mid Semester Exam: 15 Marks<br>Final Semester Exam: 25 Marks | | Lab Rubrics: 30 %<br>Open Ended Lab/Mini Project: 20 %<br>Final Exam; Objective Test*: 30 %<br>Final Exam; Conduct of Practical/Viva Voce*: 20 %<br>*Appearance in Final Exams is mandatory | |
| **Credit Hours/week** | **:** | **Th** | 2 | **Pr** | 1 |
| **Minimum Contact Hours** | **:** | **Th** | 32 | **Pr** | 48 |
| **Marks** | **:** | **Th** | 50 | **Pr** | 50 |

**After Completing the Course, each student will be able to:**

| CLO | Theory/ Practical | CLO | Taxonomy Level | PLO |
|---|---|---|---|---|
| 1 | Theory | **COMPREHEND** the fundamental laws of physics relevant to the engineering science | C2 | 1 |
| 2 | Theory | **APPLY** knowledge of basic physical laws to solve various problems of applied nature. | C3 | 2 |
| 3 | Practical | **PERFORM** experiments related force systems and Equilibrium. | P2 | 9 |
| 4 | Practical | **JUSTIFY** the applications of experiments related to force systems and Equilibrium. | A3 | 10 |

**Relevant Program Learning Outcomes (PLOs):**

**The course is designed so that students will achieve the following PLOs:**

| | | | | | |
|---|---|---|---|---|---|
| 1 | Engineering Knowledge | □ | 7 | Environment and Sustainability: | |
| 2 | Problem Analysis: | □ | 8 | Ethics: | |
| 3 | Design/Development of Solutions: | | 9 | Individual and Team Work: | □ |

| | | | | | |
|---|---|---|---|---|---|
| 4 | Investigation: | | 10 | Communication: | □ |
| 5 | Modern Tool Usage: | | 11 | Project Management: | |
| 6 | The Engineering Society: | | 12 | Lifelong Learning: | |

**OBJECTIVES:**

Students should be capable of understanding fundamental principles, developing problem-solving skills, exploring interdisciplinary applications, gaining experimental techniques, promoting critical thinking, and encouraging teamwork

**COURSE OUTLINE:**

**Units, Physical Quantities, and Vectors:** Standards and Units, Unit Consistency and Conversions, Uncertainty and Significant Figures, Vectors and Vector Addition, Products of Vector.

**Motion, Force and its effects:** Laws of motion and equation. Freely Falling Bodies, Angular motion, Relationship between angular and linear motion, Tension, Composition and resolution of force, Law of sine, Law of parallelogram, moment and couple.

**Equilibrium:** Equilibrium, its types and conditions. The center of gravity, the center of mass, and the centroid, Moment, Moment of Inertia of the body, Types of supports and support reactions

**Friction:** Friction and its modern concept, types, laws of limiting friction, and engineering applications. Work done in moving an object on horizontal and inclined planes for rough and plane surfaces with its applications.

**Work power and energy:** Work and its units, examples of zero work, positive work, and negative work, Energy and its types and transformation of energy. Power and its units, Power and its numerical problems. Simple harmonic motion: General terminologies, velocity, and acceleration of bodies moving with SHM

**Properties of materials:** Stress and strain, modulus of elasticity, Hooke's law and its applications, stress-strain diagram, pressure, surface tension, viscosity, elasticity, plasticity, brittle and ductile materials.

**PRACTICAL WORK TO BE CARRIED OUT:**

1. Find the radius, area, and volume of different geometrical shapes using a Vernier caliper, screw gauge, and tape.
2. Verify the parallelogram law of forces using force board.
3. Verify the law of conservation of moment through a set of balls on a frictionless surface.
4. Find the moment of inertia of objects using a flywheel about its axis of rotation.
5. Find the work done on the plane surface and inclined wedge.
6. Determine the effect of force at 0, 30, 45, 60, and 90 degrees with the help of a rod or rope.
7. Find the center of gravity of regular and irregular objects
8. Determine the viscosity of the different liquids using the Capillary Tube Method.
9. Find the force constant of spring using hooks law.
10. Verify the stress and strain relation of elastic materials.
11. To determine the density of different materials using a weigh scale.
12. Determine the value of acceleration due to gravity through a simple pendulum.
13. Open ended lab.

**RECOMMENDED BOOKS:**

1. Fundamentals of Physics, Extended - With WileyPLUS by David Halliday, Robert Resnick and Jearl Walker Hardback. ISBN13: 978- 1118730232.
2. Physics for Scientists and Engineers $7^{th}$ or $9^{th}$ Edition by Raymond A. Serway & John W. Jewett. ISBN-13: 978-1133947271.
3. University Physics with Modern Physics by R. A. Freedman, H. D. Young, and A. L. Ford (Sears and Zeemansky). Addison-Wesley- Longman, 13th International ed. 2010.

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| | Academic Council | Res.No.108.3(ii) | Dated:31/10/2024 |

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|---|---|---|---|---|---|
| **Title of Course:** | **:** | **Introduction to Computer Fundamentals and Programming (1 + 2)** | | | |
| **Course Code** | **:** | CETC101 | | | |
| **Semester** | **:** | 1st | | | |
| **Technology** | **:** | Civil Engineering Technology | | | |
| **Effective** | **:** | 24 – Batch | | | |
| **Pre-requisite** | **:** | Nil | | | |
| **Co-requisite** | **:** | Nil | | | |
| **Assessment** | **:** | **Theory** | | **Practical** | |
| | **:** | Quizzes/Test (s): 05 Marks<br>Assignments/Projects/Presentations: 05 Marks<br>Mid Semester Exam: 15 Marks<br>Final Semester Exam: 25 Marks | | Lab Rubrics: 30 %<br>Open Ended Lab/Mini Project: 20 %<br>Final Exam; Objective Test*: 30 %<br>Final Exam; Conduct of Practical/Viva Voce*: 20 %<br>*Appearance in Final Exams is mandatory | |
| **Credit Hours/week** | **:** | **Th** | 1 | **Pr** | 2 |
| **Minimum Contact Hours** | **:** | **Th** | 16 | **Pr** | 96 |
| **Marks** | **:** | **Th** | 50 | **Pr** | 100 |

**After Completing the Course, each student will be able to:**

| Sr. No. | Theory/ Practical | CLO | Taxonomy Level | PLO |
|---|---|---|---|---|
| 1 | Theory | **APPLY** spreadsheet programmer and its basic and selected advanced features to civil engineering technology domain | C3 | 5 |
| 2 | Theory | **DISCUSS** basics of programming for developing technical solutions to civil engineering technology domain problems | C2 | 1 |
| 3 | Practical | **PRACTICE** word processing, spread sheet, Presentation software's, and different programming languages. | P2 | 5 |
| 4 | Practical | **DEMONSTRATE** various terms related to different computer software tools. | A2 | 1 |

**Relevant Program Learning Outcomes (PLOs):**

**The course is designed so that students will achieve the following PLOs:**

| | | | | | |
|---|---|---|---|---|---|
| 1 | Engineering Knowledge | | 7 | Environment and Sustainability: | |
| 2 | Problem Analysis: | | 8 | Ethics: | |
| 3 | Design/Development of Solutions: | | 9 | Individual and Team Work: | |
| 4 | Investigation: | | 10 | Communication: | |
| 5 | Modern Tool Usage: | | 11 | Project Management: | |

| | | | | | |
|---|---|---|---|---|---|
| 6 | The Engineering Society: | | 12 | Lifelong Learning: | |

**OBJECTIVES:**

- To understand the basics of programming language, spreadsheet and its selected advanced features of civil engineering technology domain.

**COURSE OUTLINE:**

- Introduction to Computer Programming:
  - What is computer programming?
  - Importance of programming in engineering and technology
  - Programming languages and their applications
- Introduction to spread sheet program using office tools
- Introduction to data types, work sheets/workbooks
- Basic Mathematical Operations and Preparing charts/ graphs in MS Excel
- Overview of key Advanced Features of MS-Excel such as using formulae, macros, solver, etc.
- Example Application of MS-Excel for Civil Technologists (e.g., calculation of reactions, calculation of quantities, rate analysis, work scheduling, etc.)
- Developing Algorithms and Flow Charts
- Structured Programming in a Programming Language (such as Python, etc.):
  - Fundamental programming concepts (variables, data types, operators)
  - Control structures (conditional statements, loops)
  - Functions and modular programming
- Overview of Databases and MS Access

**PRACTICAL WORK TO BE CARRIED OUT:**

- Introduction to Microsoft word for Basic Features
- Introduction to Microsoft power point for Basic Features
- Introduction to Microsoft Excel for Basic Features
- Application of Microsoft Excel for Advance Features:
  - Graphical Representation
  - Weight of hollow steel pipes
  - Volume of staircase
- Application of Microsoft Excel for Advance Features:
- Formulae
- Macros
- Solver
- Application of Microsoft Excel for Civil Technologists:
- SF and BM Values

**PSEUDOCODE AND FLOWCHART**

- Introduction to Pseudocode and Drawing Flowcharts on 3 example problems in various domains of civil technology

**PYTHON PROGRAMMING**

- Basics for python programming:
  - Syntax and Data Types, Variables and Operators, Control Structures, Data Structures, Functions, Input and Output, Exception Handling, Modules and Packages
- Finding reactive forces for beam having UDL throughout its length
- Calculating Reactive forces having Point load for all three beams:
- Simply supported beam
- Cantilever beams
- Over Hanging beam

**MS ACCESS**

- Overview of MS Access with its Key Functions

- How to Create a Database
- Developing a Sample database and querying results
- Open ended lab.

**RECOMMENDED BOOKS:**


1. Access 2019 Bible – Michael Alexandar and Richard Kusleika, Wiley, Latest Edition
2. Excel 2019 Bible – Michael Alexandar and Richard Kusleika, Wiley, Latest Edition
3. Learning Python, Mark Lutz, O'Reilly, Latest Edition
4. The C++ Programming Language, Bjarne Stroustrup, Latest Edition


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| | Academic Council | Res.No.108.3(ii) | Dated:31/10/2024 |

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|---|---|---|---|---|---|
| **Title of Course:** | **:** | **Materials and Methods of construction (2 + 2)** | | | |
| **Course Code** | **:** | CET102 | | | |
| **Semester** | **:** | 1st | | | |
| **Technology** | **:** | Civil Engineering Technology | | | |
| **Effective** | **:** | 24 – Batch | | | |
| **Pre-requisite** | **:** | Nil | | | |
| **Co-requisite** | **:** | Nil | | | |
| **Assessment** | **:** | **Theory** | | **Practical** | |
| | **:** | Quizzes/Test (s): 05 Marks<br>Assignments/Projects/Presentations: 05 Marks<br>Mid Semester Exam: 15 Marks Final Semester Exam: 25 Marks | | Lab Rubrics: 30 %<br>Open Ended Lab/Mini Project: 20 %<br>Final Exam; Objective Test*: 30 %<br>Final Exam; Conduct of Practical/Viva Voce*: 20 %<br>*Appearance in Final Exams is mandatory | |
| **Credit Hours/week** | **:** | **Th** | 2 | **Pr** | 2 |
| **Minimum Contact Hours** | **:** | **Th** | 32 | **Pr** | 96 |
| **Marks** | **:** | **Th** | 50 | **Pr** | 100 |

**After Completing the Course, each student will be able to:**

| Sr. No. | Theory/ Practical | CLO | Taxonomy Level | PLO |
|---|---|---|---|---|
| 1 | Theory | **EXPLAIN** various properties of construction material | C2 | 1 |
| 2 | Theory | **CARRYOUT** suitable selection of materials according to various requirements | C3 | 2 |
| 3 | Practical | **PERFORM** experiments and carry out calculations to determine setting times of cement, gradation curves, strength and specific gravities of various materials. | P3 | 1 |
| 4 | Practical | **CONTRIBUTE** effectively as an individual or in group for performing different laboratory experiment. | A2 | 9 |

**Relevant Program Learning Outcomes (PLOs):**

**The course is designed so that students will achieve the following PLOs:**

| | | | | | |
|---|---|---|---|---|---|
| 1 | Engineering Knowledge | □ | 7 | Environment and Sustainability | |
| 2 | Problem Analysis | □ | 8 | Ethics | |
| 3 | Design/Development of Solutions | | 9 | Individual and Team Work | □ |
| 4 | Investigation | | 10 | Communication | |

| | | | | | |
|---|---|---|---|---|---|
| 5 | Modern Tool Usage | | 11 | Project Management | |
| 6 | The Engineering Society | | 12 | Lifelong Learning | |

**OBJECTIVES:**

- To understand various properties of construction material and
- carryout suitable selection of materials according to various requirements

**COURSE OUTLINE:**

**Materials:**

- Masonry units: Stones, Bricks, CC Blocks used in Construction.
- Introduction to Binding Materials used in Construction, Different types of binders used in Construction
- Cement, its types and Manufacturing Process, comparison of Cement with lime.
- Aggregates (coarse and fine) properties, standard tests (abrasion tests, crushing strength, gradation, weathering etc.).
- Mortar, Types of Mortar, Ingredients of Mortar and Preparation of Mortar.
- Concrete, its properties, ingredients, types and manufacture of Concrete.
- Types, uses, seasoning and preservation of wood or timber for construction
- Metals, properties, types, and application of metals in construction.
- Types, composition, preparation, and application of paints, varnishes.
- Bituminous materials used in Construction: Tar, Pitch and Asphalt.

**Methods of Construction:**

- Masonry, its types and characteristics.
- Bonds in brick and Stone masonry and their formation in building construction.
- Foundation, its types and characteristics.
- Walls and their types.
- Load bearing and Framed Structure
- Temporary Structures
- Technical terms used in Construction

**PRACTICAL WORK TO BE CARRIED OUT:**

**1.** Safety measures in Laboratory
**2.** Efflorescence test of brick.
**3.** Water absorption test of brick and stone.
**4.** Measurement of Standard size of different types of bricks used in Masonry work.
**5.** Water absorption test of Coarse Aggregates.
**6.** Sieve analysis and Fineness modulus test of Coarse aggregates.
**7.** Abrasion test of coarse aggregate.
**8.** Crushing strength of coarse aggregates.
**9.** Standard consistency and initial setting time test of cement.
**10.** Percentage Fineness test of Cement.
**11.** Manufacture of concrete and Casting of Cubes and Cylinders of Concrete.
**12.** Determination of compressive strength of brick/block/Concrete.
**13.** Field visit to observe formwork, scaffolding and reinforcement erection of a building construction project.
**14.** Field visit/video observation to observe concreting of a building.

**15.** Open Ended Lab.

**RECOMMENDED BOOKS:**


1. Construction Technology, Prentice Hall; 4th edition (December 30, 2005) or latest edition.
2. Fundamentals of Building Construction: Materials and Methods 6th Edition Wiley; 6th edition (October 14, 2013) or latest edition.
3. Construction Methods and Management by Stephens W. Nunnally, 8th Edition Pearson (2011) or latest edition
4. Materials of. Construction by R. C. Smith and C. K. Andres, ISBN: . 0070585040, McGraw Hill. January 1987 (Latest Edition).


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