Report

on

Maintenance and Repair of Concrete Structures

Eligible Students: B.Tech. 8th Semester

Date: 12-02-2021 to 17-05-2021

Duration of Course: 32 Hours

Course Code: CC_MRCS

No. of students Enrolled: 43

Timing: 02.35-04.00

Days: Monday & Friday

Course Coordinator: Er. Sandeep Maan, Assistant Professor (CE)

The course aimed to educate students on the significance of corrosion in concrete structures, various deterioration mechanisms, and the use of non-destructive techniques for assessment and repair. The specific maintenance and repair requirements will vary based on factors like the age, condition, usage, and exposure of the concrete structure. Overall, the goal is to preserve and restore the physical and structural integrity of concrete elements, thereby extending their service life and enhancing their performance.

Students found the course highly effective in practical learning, and the feedback received was overwhelmingly positive. It is worth mentioning that a total of 41 participants were awarded certificates upon successful completion of the program.

Teaching Pedagogy:

The course employed a comprehensive teaching pedagogy to ensure effective learning. It covered modules such as corrosion in concrete structures, deterioration of cementitious systems, non-destructive techniques for assessment, and strengthening and stabilization methods. Students were then introduced to the various equipment, learning about its components and how it works.

Topics Covered:

Module-1 Introduction to corrosion in concrete structures

- Definition of corrosion
- Significance of corrosion and corrosion mechanism
- Embedded metal corrosion

Module-2 Deterioration of cementitious systems

- Sulphate and Acid attack
- Alkali Silica Reaction (ASR)
- Shrinkage

Module-3 Non-Destructive Techniques

- Concrete assessment using non-destructive tests (NDT)
- Concrete assessment and load effects
- Surface repair – Condition assessment, Analysis, strategy

Module-4 Strengthening and stabilization

- Beam shear capacity strengthening
- Column strengthening,
- Flexural strengthening

Assessment Procedure:

The students were evaluated throughout the course based on four parameters: Technical Knowledge, Hands-on Practice, Skill Test, and Attendance. Each parameter carried a certain weightage in the overall evaluation.

1. Technical Knowledge in Concerned Field (20 marks):

This parameter measured their theoretical knowledge, conceptual understanding, and ability to apply that knowledge to practical scenarios.

2. Hands-on Practice (10 marks):

Hands-on practice evaluated the student's ability to apply their knowledge in practical situations. It measured their proficiency in utilizing tools, techniques, or software relevant to the course.

3. Skill Test (10 marks):

The skill test assessed the student's competency and proficiency in specific skills related to the course. It focused on practical skills that were essential for the field of study.

4. Attendance (10 marks):

Attendance refers to the student's regular presence in the course. It emphasizes the importance of active participation and consistent engagement throughout the duration of the program.

Outcomes:

The course outcomes can be summarized as follows:

- Students learned essential knowledge on identifying deterioration mechanisms.
- Students learned about scientific aspects of repair works.
- The use of non-destructive tools was covered, imparting knowledge on their application.
- Students developed skills in selecting measurable parameters.
- Students learned about repair and retrofitting methods.
- Students gained the ability to address deterioration mechanisms.
- The course enabled students to implement appropriate repair and maintenance practices in college campus by repairing cracks in walls, by repairing stairs etc.

Project on implementation of appropriate maintenance practices

Report

on

Surveying using Electronic Distance Measurement Instrument

Eligible Students: B.Tech. 6th Semester

Date: 12-02-2021 to 17-05-2021

Duration of Course: 34 Hours

Course Code: CC_SEDM

No. of students Enrolled: 31

Timing: 01.50-03.20

Days: Monday & Friday

Course Coordinator: Er. Rajan Vinayak, Assistant Professor (CE)

The use of digital technologies such as GPS, GIS, remote sensing, and computer-aided design software has revolutionized land surveying and mapping. Digital Land Surveying and Mapping techniques provide accurate and up-to-date information compared to traditional methods. One such method is land surveying with a Total Station, which involves the use of a theodolite and electronic distance meter (EDM) to measure angles and distances. This report summarizes a course on surveying using Total Station, covering its fundamentals, theoretical aspects, practical aspects, and applications.

The course provided an excellent platform for students to gain hands-on skills and knowledge in the fields of surveying and total station instruments. Students found the course highly effective in practical learning, and the feedback received was overwhelmingly positive. It is worth mentioning that a total of 29 participants were awarded certificates upon successful completion of the program.

Teaching Pedagogy:

The course began with an introduction to surveying methods and principles, including trigonometry functions for distance and angular measurements, coordinate systems, and units of measurements. Students were then introduced to the Total Station, learning about its components, how it works, and its advantages and limitations. The practical aspects of using a

Total Station were covered, including instrument handling, machine setup, job setup, and traversing.

Topics Covered:

The modules covered in this course are as follows:

Module-1: Fundamentals of Surveying (Theoretical Aspects)

- Introduction to surveying methods and principles
- Basic trigonometry functions for distance and angular measurements
- Basics of coordinate systems and units of measurement
- Establishing survey control points

Module-2: Total Station (Theoretical Aspects)

- Common concepts related to Total Station
- Understanding how Total Station works
- Overview of machine components
- Advantages and limitations of using Total Station

Module-3: Total Station (Practical Aspects)

- Familiarization with the various parts of the Total Station machine
- Instrument handling techniques
- Machine setup procedures, including leveling, centering, and focusing
- Job setup, station setup, and orientation methods
- Traversing techniques (close and open)
- Conducting detailed surveys

These modules were designed to provide students with a comprehensive understanding of surveying fundamentals, theoretical knowledge about Total Station instruments, and hands-on experience in utilizing Total Station for practical surveying tasks.

Assessment Procedure:

The students were evaluated throughout the course based on four parameters: Technical Knowledge, Hands-on Practice, Skill Test, and Attendance. Each parameter carried a certain weightage in the overall evaluation.

1. Technical Knowledge in Concerned Field (20 marks):

This parameter measured their theoretical knowledge, conceptual understanding, and ability to apply that knowledge to practical scenarios.

2. Hands-on Practice (10 marks):

Hands-on practice evaluated the student's ability to apply their knowledge in practical situations. It measured their proficiency in utilizing tools, techniques, or software relevant to the course.

3. Skill Test (10 marks):

The skill test assessed the student's competency and proficiency in specific skills related to the course. It focused on practical skills that were essential for the field of study.

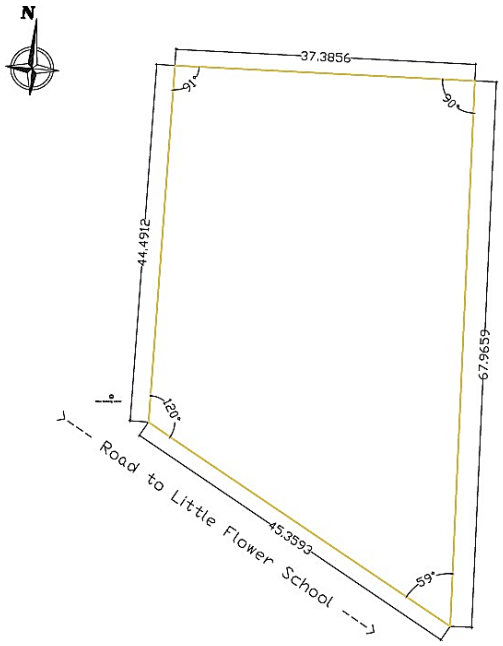
4. Attendance (10 marks):

Attendance refers to the student's regular presence in the course. It emphasizes the importance of active participation and consistent engagement throughout the duration of the program.

Outcomes:

The course outcomes can be summarized as follows:

1. The course provided knowledge on total station applications and conducting field surveying online using Total Station methodologies.
2. Students learned about the functionalities and components of Total Station equipment.
3. They were trained in setting up the station using Centering, Leveling, and Focusing approaches, although the remaining elements were outlined online due to lockdown.
4. At the end of this course students were given coordinate file for AutoCAD software, enabling them to create map and calculate distances and area of existing file coordinates taken by TS instrument.



Project on preparing map of existing area using AutoCAD software

Report

on

Pollutants and Water Supply

Eligible Students: B.Tech. 4th Semester

Date: 12-02-2021 to 30-04-2021

Duration of Course: 38 Hours

Course Code: CC_PWS

No. of students Enrolled: 29

Timing: 10.40-12.20

Days: Monday & Friday

Course Coordinator: Er. Priya Mittal, Assistant Professor (CE)

Water pollution is a significant environmental issue with severe consequences for both human health and ecosystems. Pollutants, such as heavy metals, pesticides, and microorganisms, originate from various sources, including industrial waste, agricultural runoff, and sewage. These contaminants can lead to illnesses, harm aquatic life, and reduce the quality of water for drinking and recreational purposes. To address this problem, effective measures like improved waste management practices, enhanced wastewater treatment, and stricter regulation of industry and agriculture are crucial.

The course successfully achieved its objectives, as evidenced by the positive feedback received from students. Out of 29 students, 28 received certificates upon successful completion of the course.

Teaching Pedagogy:

The course aimed to provide students with a comprehensive understanding of pollutants and the methods employed in water treatment systems. It delved into various types of pollutants, including chemical, biological, and physical contaminants, and explored their sources, characteristics, and potential effects on water quality. The course focused on equipping students with the knowledge and skills necessary to develop effective water treatment systems. It covered a range of topics, starting with water collection systems, which included the exploration of various sources of water such as surface water (rivers, lakes) and groundwater.

Topics Covered:

The modules covered in this course are as follows:

Module-1: Pollutants and their Effects

- Introduction to pollutants and their types
- Understanding air pollution and its effects
- Overview of land pollution and its impact
- Introduction to water pollution and its consequences

Module-2: Water Quality-Criteria & Analysis

- Understanding water quality and its significance
- Water requirements for various purposes
- Source and collection of water
- Overview of water purification methods
- Pre-treatment processes in water treatment

Module-3: Sedimentation Tank

- Theory of sedimentation tank
- Design principles for sedimentation tanks
- Theory and design considerations for filtration

Module-4: Reservoirs

- Storage and distribution reservoirs
- Pumps and pumping requirements in water distribution
- Valves and appurtenances in water distribution systems

Assessment Procedure:

The students were evaluated throughout the course based on four parameters: Technical Knowledge, Hands-on Practice, Skill Test, and Attendance. Each parameter carried a certain weightage in the overall evaluation.

1. Technical Knowledge in Concerned Field (20 marks):

This parameter measured their theoretical knowledge, conceptual understanding, and ability to apply that knowledge to practical scenarios.

2. Hands-on Practice (10 marks):

Hands-on practice evaluated the student's ability to apply their knowledge in practical situations. It measured their proficiency in utilizing tools, techniques, or software relevant to the course.

3. Skill Test (10 marks):

The skill test assessed the student's competency and proficiency in specific skills related to the course. It focused on practical skills that were essential for the field of study.

4. Attendance (10 marks):

Attendance refers to the student's regular presence in the course. It emphasizes the importance of active participation and consistent engagement throughout the duration of the program.

Outcomes:

The outcomes of this course can be summarized as follows, using past tense:

1. Students acquired knowledge about the chemical compositions of natural waters and understood the variations in these compositions.
2. They learned to work collaboratively in teams to carry out experimental tasks.
3. Students gained an understanding of the main types of pollutants and learned how each type can be controlled.
4. They also learned about the treatment processes involved in treating sewage before its discharge into the environment.
5. At the end of this course, students were provided with water samples, project culminated in presentations and discussions on the proposed water treatment systems, allowing students to showcase their creative solutions to mitigating water pollution.

Project on Jar testing equipment for chemical treatment

Report

on

Introduction and Implementation of Neural Networks through MATLAB

Eligible Students: B.Tech.7th Semester

Date: 01/03/2021 TO 07/05/2021

Duration of Course: 32 Hours

Course Code: CC_NML

No. of students Enrolled: 29

Timing: 1:50 to 3:20

Days: Monday & Friday

Course Coordinator: Er. Harkamaldeep Kaur, Assistant Professor (EE)

The Introduction and Implementation of Neural Networks course was conducted during the 2021-22 session for B.Tech students. This course aimed to provide a comprehensive understanding of neural networks and their implementation. The duration of the course was 32 hours, and all 29 enrolled students successfully completed the course. All the enrolled students, had successfully completed the course.

Teaching Pedagogy:

The teaching pedagogy for the Introduction and Implementation of Neural Networks course focused on providing a conceptual understanding of neural networks and practical implementation techniques. The course employed a combination of theoretical lectures, hands-on programming sessions, and real-world case studies. The lectures covered the basics of neural networks, their architecture, activation functions, and training algorithms. Hands-on programming sessions allowed students to implement neural networks using popular frameworks and libraries. Real-world case studies provided practical insights into the applications of neural networks in various domains such as image recognition, natural language processing, and predictive modeling. Regular assessments and feedback sessions were conducted to track the progress of students and address any queries or difficulties they encountered during the course.

Topics Covered:

Module 1: Introduction to Neural Networks

Overview of Neural Network structure, learning process, and visualization techniques.

Module 2: Applications of Neural Networks

Exploration of Neural Network applications in facial recognition, stock market prediction, social media analysis, aerospace and defense, and healthcare.

Module 3: Theory of Neural Networks

Foundations of Neural Networks, importance of Neural Networks, classification techniques using Neural Networks, implementation in MATLAB and neural tools.

Module 4: Neural Network Demo

Demonstration of Neural Networks in artificial intelligence, machine learning, language translation, and face identification.

Assessment Procedure:

The students were evaluated throughout the course based on four parameters: Technical Knowledge, Hands-on Practice, Skill Test, and Attendance. Each parameter carried a certain weightage in the overall evaluation.

1. Technical Knowledge in Concerned Field (20 marks):

This parameter measured their theoretical knowledge, conceptual understanding, and ability to apply that knowledge to practical scenarios.

2. Hands-on Practice (10 marks):

Hands-on practice evaluated the student's ability to apply their knowledge in practical situations. It measured their proficiency in utilizing tools, techniques, or software relevant to the course.

3. Skill Test (10 marks):

The skill test assessed the student's competency and proficiency in specific skills related to Arduino programming and hardware fundamentals. It focused on practical skills essential for the field of study.

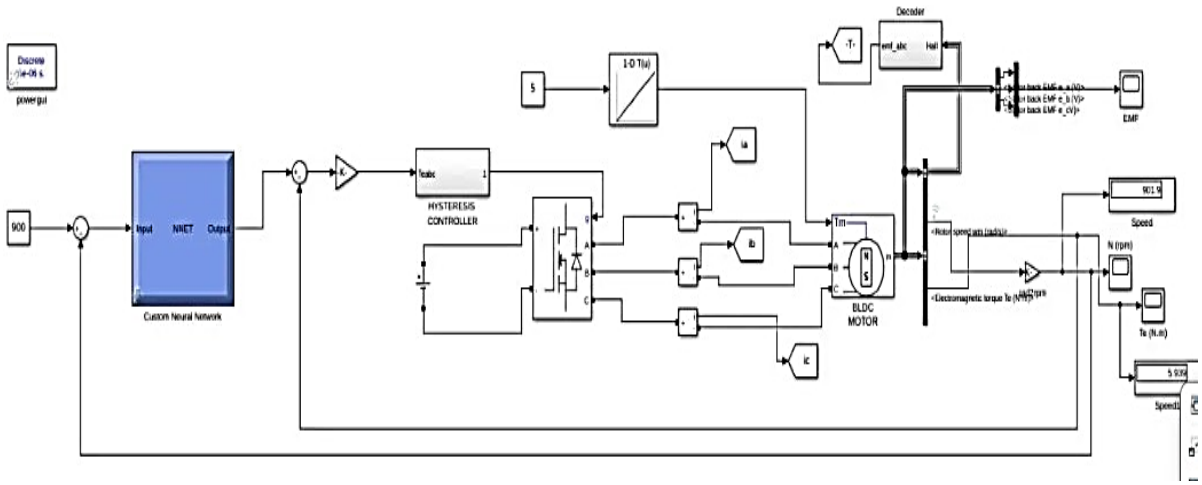
4. Attendance (10 marks):

Attendance referred to the student's regular presence in the course. It emphasized the importance of active participation and consistent engagement throughout the duration of the program.

Outcomes:

Upon completion of the Introduction and Implementation of Neural Networks course, students achieved the following outcomes:

1. Acquired a solid understanding of neural networks, their architecture, and working principles.
2. Developed proficiency in implementing neural networks using popular frameworks and libraries.
3. Explored various activation functions and training algorithms to optimize the performance of neural networks.
4. Successfully completed the project "Speed Control of BLDC Motor using Neural Network in MATLAB Simulink," demonstrating their ability to apply neural network concepts in practical applications.



Screenshot of Speed Control of BLDC Motor using Neural Network in MATLAB Simulink

Report

on

Design and Optimization of Solar PV Models

Eligible Students: B.Tech 6th Semester

Date: 01-03-2021 to 07-05-2021

Duration of Course: 32 Hours

Course Code: CC_PVS

No. of students Enrolled: 34

Timing: 1:50 PM-3.20 PM

Days: Monday & Friday

Course Coordinator: Er. Shilpy Goyal, Assistant Professor (EE)

This report highlights the key aspects of a course on designing and optimizing solar PV models conducted for eligible students of B.Tech. 6th Semester. All the enrolled students had successfully completed the course.

The Design and Optimization of Solar PV Models course provided participants with comprehensive knowledge and skills related to solar photovoltaic (PV) technology. The course covered the major components of a solar PV system, including solar charge controllers, inverters, battery banks, auxiliary energy sources, and loads. Participants also learned about the role of solar power optimizers in improving power output and efficiency. The course emphasized the renewable and "green" nature of solar power, highlighting its benefits as a sustainable energy source.

Teaching Pedagogy:

The course followed a structured approach with six modules. It introduced participants to PV cells and understanding of their operation, sizing PV systems, maximum power point tracking (MPPT) methods, MPPT algorithms, PV-battery interfaces, cooling approaches, different methods of interfacing with water pumps, PV-grid interfaces and their various methodologies.

Topics Covered:

The course covered various modules to equip the students with the necessary knowledge and skills related to solar PV technology. The modules included:

Module 1: The PV Cell Incident Energy Estimation - Introduction to PV cell and basics.

Module 2: Sizing PV, Maximum Power Point Tracking - Concepts of sizing and methods for achieving Maximum Power Point Tracking.

Module 3: MPPT Algorithms - Exploration of different algorithms for Maximum Power Point Tracking.

Module 4: PV-Battery Interfaces, Peltier Cooling - Different interfacing methods and cooling approaches for PV-battery systems.

Module 5: PV and Water Pumping, PV-Grid Interface-I - Interfacing methodologies for PV-based water pumps and grid connections.

Module 6: Interface-II and Life Cycle Costing - Understanding lifecycle analysis, interfacing methods, and approaches.

Assessment Procedure:

The students were evaluated throughout the course based on four parameters: Technical Knowledge, Hands-on Practice, Skill Test, and Attendance. Each parameter carried a certain weightage in the overall evaluation.

1. Technical Knowledge in Concerned Field (20 marks):

This parameter measured their theoretical knowledge, conceptual understanding, and ability to apply that knowledge to practical scenarios.

2. Hands-on Practice (10 marks):

Hands-on practice evaluated the student's ability to apply their knowledge in practical situations. It measured their proficiency in utilizing tools, techniques, or software relevant to the course.

3. Skill Test (10 marks):

The skill test assessed the student's competency and proficiency in specific skills related to the course. It focused on practical skills that were essential for the field of study.

4. Attendance (10 marks):

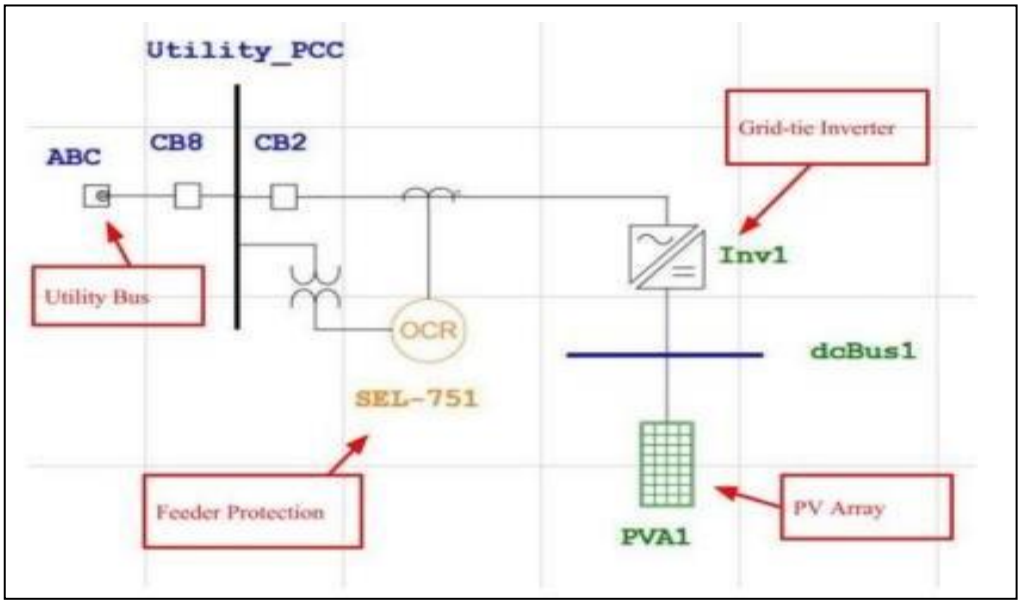
Attendance refers to the student's regular presence in the course. It emphasizes the importance of active participation and consistent engagement throughout the duration of the program.

Outcome:

1. Acquired knowledge about relevant organizations, major international projects, and information sources related to solar PV technology.

2. Developed the ability to specify, analyze, and design autonomous photovoltaic systems.
3. Gained insights into analyzing the behavior of self-consumption demand and understanding network management measurements.
4. Learned to carry out basic engineering projects based on solar PV technology.

In conclusion, the course on the design and optimization of solar PV models provided eligible B.Tech.6th Semester students with a comprehensive understanding of solar PV technology. Through a combination of theoretical learning and practical applications, the students gained the necessary knowledge and skills to specify, analyze, and design autonomous photovoltaic systems. The positive feedback from the students further exemplifies the course's success in achieving its objectives and preparing the students for future endeavors in the field of solar PV technology.



Screenshot of Micro Grid system in ETAP Simulator

Report

on

Design and Implementation of Electrical Systems through Multisim

Eligible Students: B.Tech 4th Semester

Date: 16-02-2021 to 11-05-2021

Duration of Course: 32 Hours

Course Code: CC_MS

No. of students Enrolled: 21

Timing: 1:50 PM-3.50 PM

Days: Tuesday & Thursday

Course Coordinator: Er. Shilpy Goyal, Assistant Professor (EE)

The design and implementation of electrical systems through Multisim is a crucial aspect of electrical engineering education. Multisim TM is a powerful electrical circuit simulation package that allows users to create schematics and run simulations. This report highlights the key aspects of a course on designing and implementing electrical systems using Multisim, conducted for eligible students of B.Tech. 4th Semester. All the enrolled students had successfully completed the course.

The course provided students with a solid foundation in Ni-Multisim, enabling them to understand and work with electrical systems effectively. Through theoretical explanations and practical exercises, the students gained knowledge about electrical networks, parameter calculations, and system design using Multisim. The acquired skills and knowledge will help the students in their future endeavors in the field of electrical engineering.

Teaching Pedagogy:

The course followed a structured approach with seven modules. They provide introduction to the Multisim software, including the toolbar, pop-up menus, setting schematic capture reference, the installation of the software, downloading various libraries, utilizing decal and import buttons., different electrical network analysis techniques, such as branch currents and voltages, Thevenin's

equivalent network, impedance and admittance parameters, ABCD , inverse ABCD parameters, and hybrid and inverse hybrid parameters.

Topics Covered:

The course covered several modules to provide students with comprehensive knowledge and skills related to designing and implementing electrical systems using Multisim. The modules included:

Module 1: Introduction to Multisim Software - Familiarization with the software interface, toolbars, simulation options, and library management.

Module 2: Multisim Library - Understanding the use of libraries, creating new libraries, and utilizing various components and symbols.

Module 3: Branch Currents and Voltages - DC network analysis techniques, understanding circuit directions, writing equations using Kirchhoff's laws (KCL and KVL), and determining currents and voltages in the network.

Module 4: Thevenin's Equivalent Network - Thevenin's theorem, analysis of linear bilateral two-terminal networks.

Module 5: Impedance and Admittance Parameters - Calculation of Z-parameters and Y-parameters, current and voltage analysis.

Module 6: ABCD and Inverse ABCD Parameters - Analysis of ABCD two-port networks.

Module 7: Hybrid and Inverse Hybrid Parameters - Analysis of H-parameter-based two-port networks.

Assessment Procedure:

The students were evaluated throughout the course based on four parameters: Technical Knowledge, Hands-on Practice, Skill Test, and Attendance. Each parameter carried a certain weightage in the overall evaluation.

1. Technical Knowledge in Concerned Field (20 marks):

This parameter measured their theoretical knowledge, conceptual understanding, and ability to apply that knowledge to practical scenarios.

2. Hands-on Practice (10 marks):

Hands-on practice evaluated the student’s ability to apply their knowledge in practical situations. It measured their proficiency in utilizing tools, techniques, or software relevant to the course.

3. Skill Test (10 marks):

The skill test assessed the student's competency and proficiency in specific skills related to the course. It focused on practical skills that were essential for the field of study.

4. Attendance (10 marks):

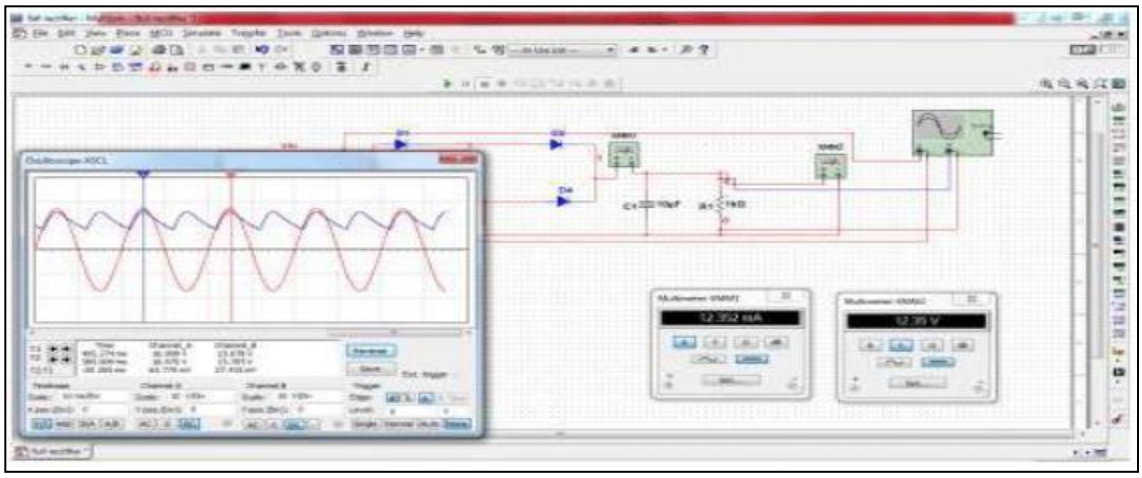
Attendance refers to the student's regular presence in the course. It emphasizes the importance of active participation and consistent engagement throughout the duration of the program.

Outcome:

Upon completion of the course, the students achieved several key outcomes:

1. Acquired knowledge about electrical networks, their design, and implementation using Multisim software.
2. Developed the ability to calculate different parameters of electrical systems and analyze their behavior.
3. Gained hands-on experience in drawing electrical network diagrams using Multisim.
4. Understood the role of electrical systems in various industries and the integration of hardware and software for electrical applications.

In conclusion, the course on the design and implementation of electrical systems through Multisim proved to be valuable for eligible B.Tech. 4th Semester students. By providing a comprehensive understanding of Multisim software and its applications in electrical system design, the course contributed to enhancing the students' knowledge, skills, and practical experience. The positive outcome of the course highlights its success in achieving its objectives and preparing the students for real-world electrical engineering challenges.



Screenshot of Simulation of Full wave rectifier

BABA FARID COLLEGE OF ENGG. & TECHNOLOGY

Report

On

Data Science Using Python

Eligible Students: B.Tech 8th Semester

Duration of Course: 32 Hours

Date: 04-03-2021 to 17-05-2021

Course Code- CC_DSP

No. of Students Enrolled in the course: 39

Timing: 01:50 pm to 03:20 pm

Days: Monday & Thursday

Course Coordinator: Er. Navjot Singh, Assistant Professor (CSE)

The B.Tech. Computer Science & Engineering course's 8th semester included a module on Python programming with the course code CC_DSP. This course focused on the versatile capabilities of Python, which extends beyond web application development to encompass workflows, database connectivity, file handling, big data processing, and complex mathematics. Python is widely used for both rapid prototyping and production-ready software development. The objective of this course was to provide students with essential knowledge of the Python language, ranging from basic to advanced levels. The hands-on practice sessions allowed students to work on projects involving IoT, machine learning, and web development. Python's prominence in the programming landscape made it crucial for students to acquaint themselves with its fundamentals. With practical exposure to real-life projects, students enhanced their technical skills. The course emphasized topics such as numeric and symbolic computations, 2D/3D graph plotting using libraries, and web development. The significant enrollment of 39 students reflected the popularity and importance of Python in the field of computer science and engineering.

Teaching Pedagogy:

The teaching pedagogy of the Python programming course adopted a practical and hands-on approach to learning. Students actively engaged in coding exercises, projects, and real-life simulations to deepen their understanding of Python concepts and applications. The course

began with setting up the Python environment and gradually progressed to cover topics such as lists, arrays, matrices, loops, tuples, dictionaries, functions, and modules. Students gained proficiency in Python programming through practical exercises, which included generating OTPs and QR codes for websites. The course also introduced object-oriented programming (OOPs) and explored important libraries like Numpy, Pandas, and Matplotlib. By emphasizing real-life projects and web development, students gained valuable exposure to the practical application of Python in various domains. This pedagogical approach ensured that students not only grasped theoretical concepts but also developed the necessary skills to apply Python effectively in real-world scenarios.

Topic covered:

Module 1: Setting Python environment, variables, directory management, software installations, importing and installing important and basic libraries, setup testing.

Module 2: Introduction to Arrays, List Introduction Accessing, Elements of List Traversing, The List Important Functions of List, Manipulating Elements of List, Ordering Elements of List, Comparing List Objects, Manipulate Nested List, List Comprehensions.

Module 3: Introduction to Matrix and Loops, Tuple Introduction Traversing, The Tuple Important Functions of Tuple, Tuple Packing and Unpacking Generators, Dictionary Introduction, Delete and Update Dictionaries, Important Functions of Dictionaries, Important Programs of Dictionaries.

Module 4: Introductions to Functions Types of Arguments Types of Variables Recursive Function Anonymous Function Lambda Function, map(), Filter(),reduce() Functions

Module 5: Basics of Classes Object, Reference Variable Constructor, Types of Variables. Types of Methods Garbage Collection Destructors, Introduction to different modules.

Module 6: Introduction to Packages, Advantages of Packages, Defining Package, Reference Variable Constructor, Types of Variables Types of Methods Garbage Collection Destructors, importing Pandas and Matplotlib.

Assessment Procedure:

The students were evaluated throughout the course based on four parameters: Technical Knowledge, Hands-on Practice, Skill Test, and Attendance. Each parameter carried a certain weightage in the overall evaluation.

1. Technical Knowledge in Concerned Field (20 marks):

This parameter measured their theoretical knowledge, conceptual understanding, and ability to apply that knowledge to practical scenarios.

2. Hands-on Practice (10 marks):

Hands-on practice evaluated the student's ability to apply their knowledge in practical situations. It measured their proficiency in utilizing tools, techniques, or software relevant to the course.

3. Skill Test (10 marks):

The skill test assessed the student's competency and proficiency in specific skills related to the course. It focused on practical skills that were essential for the field of study.

4. Attendance (10 marks):

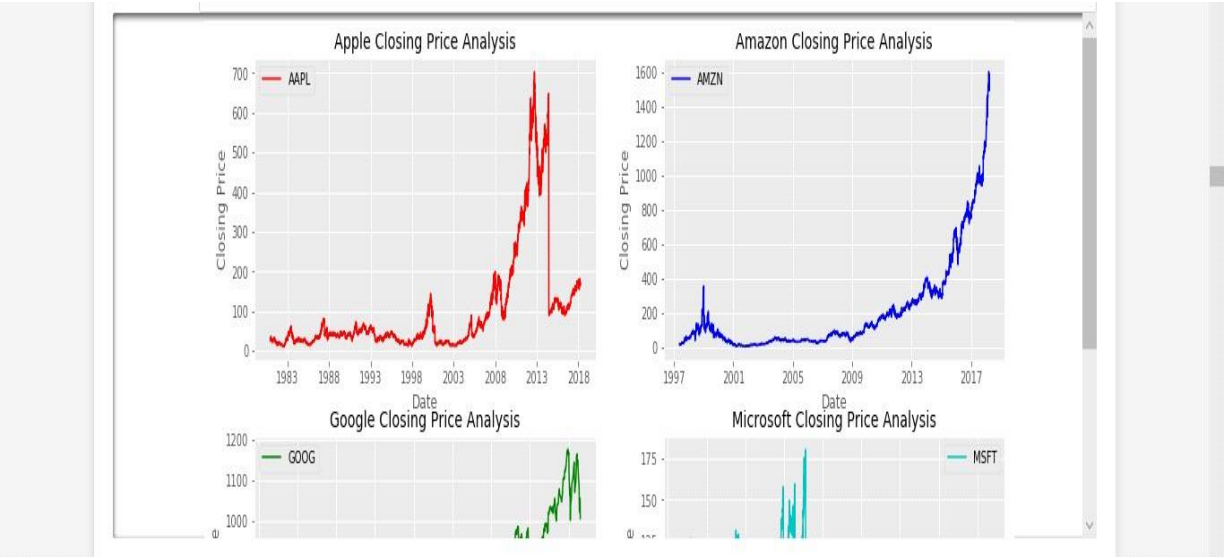
Attendance refers to the student's regular presence in the course. It emphasizes the importance of active participation and consistent engagement throughout the duration of the program.

Outcome:

The course aimed to achieve the following outcomes:

1. Provide necessary knowledge about Python for performing tasks like numeric and symbolic computations, graph plotting, and web development.
2. Familiarize students with the fundamentals of Python and advance their skills in the language.
3. Enable students to design solutions for complex engineering problems using Python.
4. Develop students' ability to select and apply appropriate Python concepts to meet specified needs, considering public health, safety, and environmental factors.
5. Equip students with the skills to use modern engineering and IT tools, including prediction and modeling techniques.
6. Foster an understanding of the limitations and constraints involved in applying Python in engineering activities.

Overall, the course aimed to empower students with the necessary knowledge and skills to utilize Python effectively in their future endeavors, particularly in the field of data science.



Screenshot of Stock Market Analyzer

Report

On

Advance Cloud Computing

Eligible Students: B.Tech. 6th semester

Duration of Course: 32 Hours

Date: 15-03-2021 to 20-05-2021

Course Code- CC_ACC

No. of Students Enrolled in the course: 40

Timing: 1:50 pm to 3:20 pm

Days: Monday & Thursday

Course Coordinator: Er. Sunil Nagpal, Assistant Professor (CSE)

The Cloud Computing certificate course, with the course code CC_ACC, was designed for B.Tech. 6th semester students. This course aimed to provide students with a comprehensive understanding of cloud computing, data structures implementation, and the use of cloud computing services. Students were introduced to cloud storage, cloud computing services and hosting, cloud data storage and deployment models, cloud infrastructure, and the advantages and issues related to cloud computing. The course emphasized practical learning through hands-on exercises, discussions, and interactive sessions. A total of 40 students were enrolled in the course, all of whom successfully completed the program. The course had a duration of 32 hours**.**

Teaching Pedagogy:

The Cloud Computing course employed a comprehensive teaching pedagogy that included theoretical lectures and hands-on practical exercises. The theoretical lectures covered essential concepts, principles, and theories, supplemented by interactive discussions and real-world examples to illustrate practical applications. Hands-on practical exercises provided students with the opportunity to work with cloud computing tools and technologies, applying their theoretical knowledge in a simulated environment. Faculty guidance and support were available during these sessions. Group activities and projects promoted collaboration and problem-solving skills. Regular assessments and feedback ensured students' progress and comprehension. The teaching pedagogy aimed to create an engaging and interactive learning

environment, fostering a comprehensive understanding of cloud computing principles and equipping students with the necessary skills for success in this dynamic field.

Topics Covered:

Module 1: Cloud Computing Fundamentals: Introduction to cloud delivery models and architecture.

Module 2: Role of Virtualization in Cloud Computing: Understanding virtualized environments and their connection to cloud computing.

Module 3: Installation of Hadoop: Exploring Hadoop, its features, and configuring Hadoop VM.

Module 4: Moving Data in and out of Hadoop: Introduction to Hive, SQL basics, and working with internal and external tables.

Module 5: Working with Record Reader and Record Writer: Understanding Hadoop Record Reader and its types.

Module 6: Deployment of Cloud Computing Tools and Technologies: Hands-on experience with OpenStack and different cloud deployment models**.**

Assessment Procedure:

The students were evaluated throughout the course based on four parameters: Technical Knowledge, Hands-on Practice, Skill Test, and Attendance. Each parameter carried a certain weightage in the overall evaluation.

1. Technical Knowledge in Concerned Field (20 marks):

This parameter measured their theoretical knowledge, conceptual understanding, and ability to apply that knowledge to practical scenarios.

2. Hands-on Practice (10 marks):

Hands-on practice evaluated the student's ability to apply their knowledge in practical situations. It measured their proficiency in utilizing tools, techniques, or software relevant to the course.

3. Skill Test (10 marks):

The skill test assessed the student's competency and proficiency in specific skills related to the course. It focused on practical skills that were essential for the field of study.

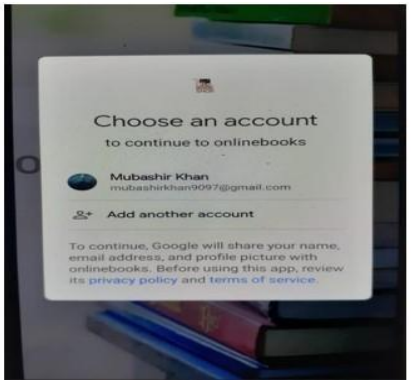
4. Attendance (10 marks):

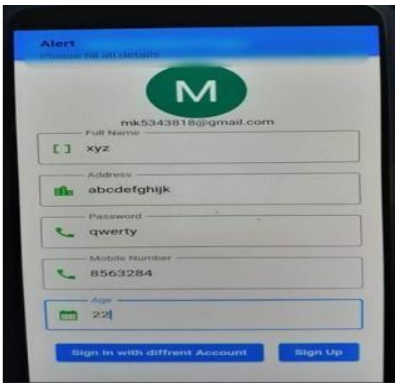
Attendance refers to the student's regular presence in the course. It emphasizes the importance of active participation and consistent engagement throughout the duration of the program.

Outcome:

The Cloud Computing course had provided the necessary foundation to navigate the evolving field of cloud computing, enabling individuals to understand and utilize cloud services and technologies in various industry domains.

1. An understanding of the concepts, characteristics, and delivery models of cloud computing had been gained.
2. The key security and compliance challenges in cloud computing had been recognized.
3. The technical and organizational challenges in cloud computing had been identified.
4. Proficiency in Hadoop architecture and data movement in a cloud environment had been acquired.
5. Cloud security measures had been implemented and the role of virtualization had been understood.
6. Different services provided by the cloud had been managed and cloud computing tools and technologies had been deployed effectively.





Screenshot of Online Book Search

BABA FARID COLLEGE OF ENGG. & TECHNOLOGY

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Report

on

Engineering Wears

Eligible Students: B.Tech. 4th Semester

Date: 08-02-2021 to 14-04-2021

Duration of Course: 32 Hours

Course Code: CC_EW

No. of Students Enrolled in the course: 21

Timing: 11:30 am to 01:05 pm

Days: Monday & Wednesday

Course Coordinator: Er. Indraj Kumar

Engineering Wears course conducted during the session 2019-20 for B.Tech. students. This certificate course delves into the fascinating field of engineering materials and the critical role they play in various industries. This course explored the science behind wear, friction, and lubrication to ensure the efficient functioning and longevity of mechanical systems. The course duration was 32 hours, where 21 enrolled students successfully completed the course.

Throughout this course, the students examined the fundamental concepts of wear, including the different types of wear mechanisms, such as adhesive, abrasive, erosive, and corrosive wear. Students determined the factors influencing wear, such as contact pressure, sliding velocity, temperature, and surface roughness, and learn how to mitigate wear through various engineering strategies.

Teaching Pedagogy:

The Engineering Wears course employs a diverse range of teaching pedagogies to create an engaging and interactive learning experience. Through comprehensive lectures, real-world case studies, hands-on experiments, group discussions, multimedia resources, guest lectures, assignments, projects, and assessments, students will develop a solid understanding of the fundamental principles and practical applications of engineering wears. Online learning platforms will complement these methods, providing additional resources and

facilitating collaborative learning. By combining theory, practical experimentation, and industry insights, this pedagogical approach aims to foster critical thinking, problem-solving skills, and the ability to analyze and optimize the performance of engineering components in the face of wear-related challenges.

Topics Covered:

MODULE-1: Introduction to Engineering Wear

The module provides an overview of engineering wear and its significance in design and industrial applications. It covers topics such as viscosity, flow of fluids, and the nature of surfaces in contact. Participants will learn about the properties of surface layers, methods of studying surfaces, and the contact behavior of smooth and rough surfaces.

MODULE-2: Wear and its Potential Reasons

The module focuses on the causes and morphology of wear. It discusses design issues, friction in upper and lower pairs, and different types of friction. Participants will explore the definition, mechanisms, and measurement of wear, as well as the theories associated with wear phenomena. The module also covers wear of materials and the impact of friction on wear.

MODULE-3: Introduction to ASTM and Various Codes

The Module introduces the American Society for Testing and Materials (ASTM) and various codes related to wear. It presents case studies of wear occurring in fields such as agricultural tillage and industrial production, including the airline industry. The module explores remedial measures for mechanical wear through metallurgical processes. Participants will also learn about bearing selection, lubrication, maintenance, and diagnostic considerations in different tribological components.

MODULE-4: Lubrication and Lubricants

The module focuses on lubrication and lubricants. It covers the principles of lubrication and the general requirements of bearing materials. Participants will learn about different types of bearing materials and their applications. The module delves into hydrostatic step bearings, hydrodynamic theory of lubrication, friction in sliding bearings, and hydrodynamic thrust bearings. Additionally, participants will gain an understanding of lubricant functions, types, properties, and selection criteria, as well as the classification, recycling, and disposal of oils.

Assessment Procedure:

The students were evaluated throughout the course based on four parameters: Technical Knowledge, Hands-on Practice, Skill Test, and Attendance. Each parameter carried a certain weightage in the overall evaluation.

1. **Technical Knowledge in Concerned Field (20 marks):**
   This parameter measured their theoretical knowledge, conceptual understanding, and ability to apply that knowledge to practical scenarios.
2. **Hands-on Practice (10 marks):**
   Hands-on practice evaluated the student's ability to apply their knowledge in practical situations. It measured their proficiency in utilizing tools, techniques, or software relevant to the course.
3. **Skill Test (10 marks):**
   The skill test assessed the student's competency and proficiency in specific skills related to the course. It focused on practical skills that were essential for the field of study.
4. **Attendance (10 marks):**
   Attendance refers to the student's regular presence in the course. It emphasizes the importance of active participation and consistent engagement throughout the duration of the program.

Outcome:

1. Knowledge of Surface Topography: Students acquired the ability to understand and model the surface topography of engineering materials, allowing them to analyze and predict wear behavior based on surface roughness and contact conditions.
2. Understanding of Tribology Basics: Students developed a comprehensive understanding of the fundamental principles of tribology and related sciences. They grasped the theoretical background of processes occurring in tribological systems and the various mechanisms and forms of interaction between friction surfaces.
3. Familiarity with Types of Wear: Students became familiar with different types of wear mechanisms, including adhesive, abrasive, erosive, and corrosive wear. They understood the underlying mechanisms of each type and recognized the factors that

influence wear behavior in various engineering systems.

4. Methods to Reduce Friction: Students learned various methods to reduce friction in engineering systems, such as surface coatings, lubrication strategies, and surface treatments. They acquired the skills to identify friction-related problems and implemented effective solutions to enhance the efficiency and lifespan of mechanical components.
5. Students had hands on practice on different types of wear on machine components. It was the major achievement of the certificate course.

Glimpse of Practical Session for worn out machine components

BABA FARID COLLEGE OF ENGG. & TECHNOLOGY

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Report

on

Basics of AUTO CAD

Eligible Students: B.Tech. 6th Semester

Date: 08-02-2021 to 26-04-2021

Duration of Course: 32 Hours

Course Code: CC_BAC

No. of Students Enrolled in the course: 31

Timing: 01:50 pm to 03:20 pm

Days: Monday & Wednesday

Course Coordinator: Er. Indraj Kumar

The Basics of AutoCAD course conducted during the session 2017-18 for B.Tech. students. This certificate course offers a comprehensive learning experience for individuals seeking to develop proficiency in computer-aided design (CAD). AutoCAD is a powerful software widely used in various industries, including architecture, engineering, and construction. The course duration was 32 hours, where 31 enrolled students successfully completed the course.

The faculty expert ensured to equip students with the necessary knowledge and skills to effectively utilize AutoCAD for creating precise 2D and 3D digital designs. Through hands-on practice and interactive sessions, students will learn the fundamental tools and techniques of AutoCAD, enabling them to produce professional drawings, models, and layouts.

Teaching Pedagogy:

The teaching pedagogy for the Basics of AutoCAD course focuses on hands-on learning and interactive methods. Students will receive live demonstrations to understand AutoCAD functionalities, followed by ample opportunities for hands-on practice. Individual guidance and collaborative learning activities will enhance the learning experience. Regular assessments will provide feedback, and real-world applications will highlight the practical relevance of AutoCAD. A project-based approach will allow students to apply their skills, and additional resources will encourage continuous learning beyond the classroom. Through

these methods, the course aims to provide a comprehensive and practical understanding of AutoCAD for 2D and 3D design purposes.

Topics Covered:

Module 1: Introduction to Auto CAD

Introduction of AutoCAD, AutoCAD versions, Interface, Control the Drawing, Function keys, AutoCAD basics, Coordinate system, Cartesian, coordinate system,

Module 2: Draw and Modify commands

Draw Commands-Line, Poly line command, Rectangle command, modify commands-Move, Rotate, Scale, copy, Mirror, erase, trim, extend, Annotate-Dimension Style, Manager Linear, Aligned, Radius, Angular, Arc length

Module 3: Text command, Layers, blocks

Text command-Single line text, Multiline text Layers, Layer properties, Blocks, insert blocks, Parametric Geometric, Dimensional Manage

Module 4: Isometric views

Isometric views-Isometric top, left, right Isometric diagrams, Isometric drawings, Isometric diagrams, exercise, 2D Fundamentals, Drawing units, Sheet settings, Mechanical diagrams

Module 5: Project

Mechanical Projects

Assessment Procedure:

The students were evaluated throughout the course based on four parameters: Technical Knowledge, Hands-on Practice, Skill Test, and Attendance. Each parameter carried a certain weightage in the overall evaluation.

1. **Technical Knowledge in Concerned Field (20 marks):**
   This parameter measured their theoretical knowledge, conceptual understanding, and ability to apply that knowledge to practical scenarios.
2. **Hands-on Practice (10 marks):**
   Hands-on practice evaluated the student's ability to apply their knowledge in practical situations. It measured their proficiency in utilizing tools, techniques, or software relevant to the course.

3. **Skill Test (10 marks):**

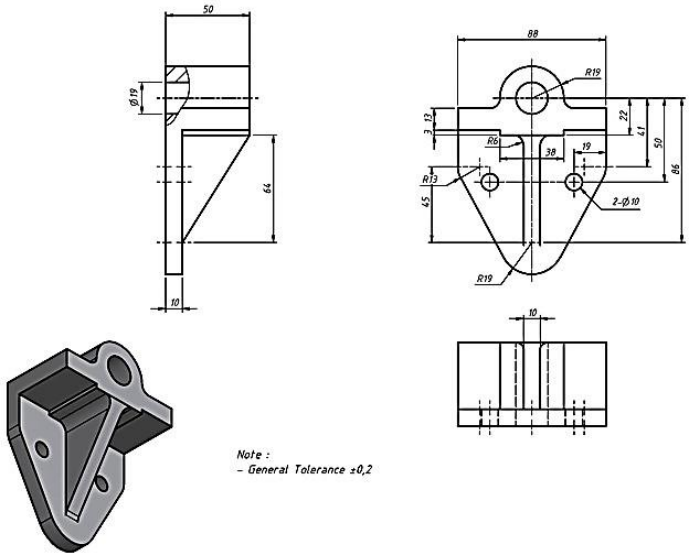
   The skill test assessed the student's competency and proficiency in specific skills related to the course. It focused on practical skills that were essential for the field of study.

4. **Attendance (10 marks):**

   Attendance refers to the student's regular presence in the course. It emphasizes the importance of active participation and consistent engagement throughout the duration of the program.

Outcome:

1. They have gained a comprehensive understanding of CAD concepts and CAD tools, allowing them to navigate and utilize CAD software effectively.
2. The students now possess a solid understanding of Concepts, Wireframe, and Surface modeling techniques, enabling them to create complex and detailed 3D models.
3. They have acquired the ability to create precise engineering drawings using CAD software, utilizing the Part modeling feature to develop accurate representations of engineering components.
4. Students made a design of support bracket, bearing bracket and many more. It was the major achievement of the certificate course.



Design of Support Bracket using AUTOCAD

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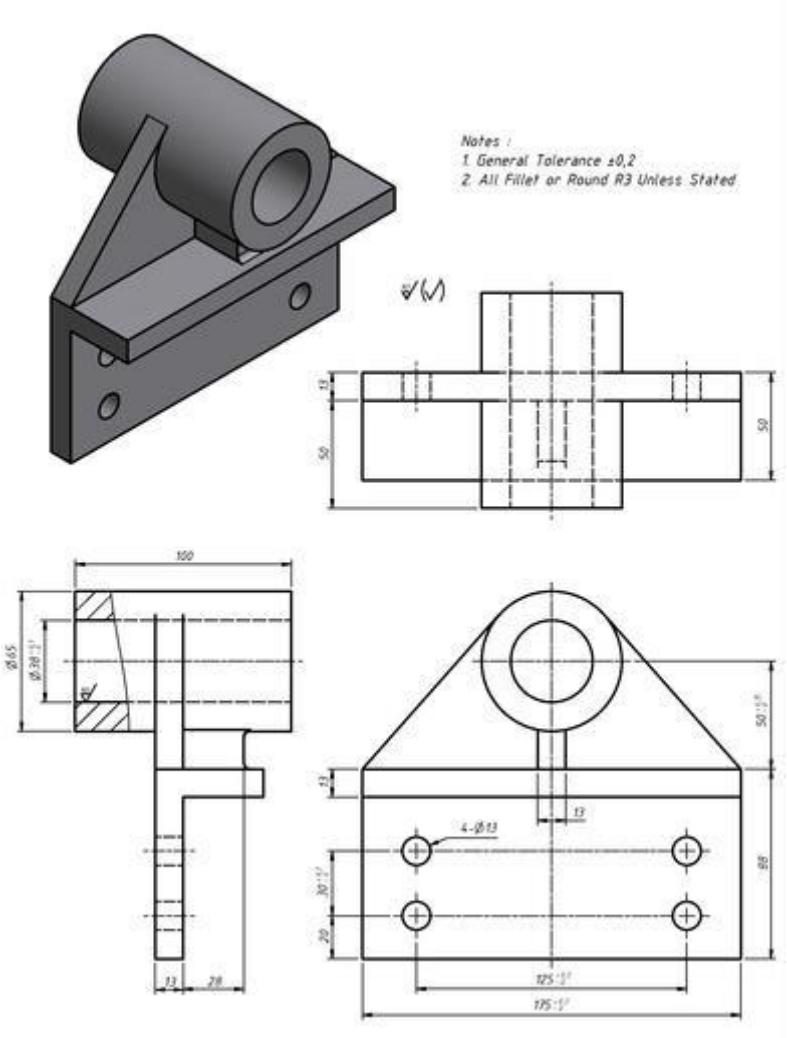


Design of Bearing Bracket using AUTOCAD

Report

on

Project planning and Control

Eligible Students: B.Tech. 7th Semester

Date: 18-08-2020 to 05-11-2020

Duration of Course: 38 Hours

Course Code: CC_PPC

No. of students Enrolled: 41

Timing: 10.40-12.20

Days: Tuesday & Thursday

Course Coordinator: Er. Pankaj Mittal, Assistant Professor (CE)

The Project Planning and Control course provides students with a comprehensive understanding of the processes involved in managing construction projects. It covers key concepts such as project scope definition, goal setting, task identification, resource estimation, and schedule creation. The course emphasizes the importance of completing projects within set timelines, budget constraints, and quality standards. By aligning all aspects of the project towards its goals, project planning and control increase the likelihood of successful project outcomes.

The course provided an excellent platform for students to gain hands-on skills and knowledge. Feedback received was overwhelmingly positive. It is worth mentioning that a total of 41 participants were awarded certificates upon successful completion of the program.

Teaching Pedagogy:

The course is divided into various modules, each focusing on essential aspects of construction project management, introduces students to the fundamentals of construction project management, emphasizing time management, and covers estimation techniques, network analysis, delves into resource scheduling and further explores network analysis. Finally, addresses project monitoring and control, including earned value concepts and time-cost trade-offs.

Topics Covered:

The modules covered in this course are as follows:

Module-1: Introduction to Construction Project Management

- Introduction to the role and significance of project management in construction projects.
- Understanding the specific context and challenges of managing construction projects.
- Time management

Module-2: Estimation

- Gantt Charts
- Duration of Estimation
- Introduction to network representation techniques
- Methods for project planning and control.

Module-3: Resource Scheduling

- Applying network analysis concepts to a specific case study of scheduling a two-span bridge construction project.

Module-4: Project Monitoring & Control

- Project Monitoring & Control (Earned Value Concepts)
- Uncertainty in Project Schedules (PERT)

Assessment Procedure:

The students were evaluated throughout the course based on four parameters: Technical Knowledge, Hands-on Practice, Skill Test, and Attendance. Each parameter carried a certain weightage in the overall evaluation.

1. Technical Knowledge in Concerned Field (20 marks):

This parameter measured their theoretical knowledge, conceptual understanding, and ability to apply that knowledge to practical scenarios.

2. Hands-on Practice (10 marks):

Hands-on practice evaluated the student's ability to apply their knowledge in practical situations. It measured their proficiency in utilizing tools, techniques, or software relevant to the course.

3. Skill Test (10 marks):

The skill test assessed the student's competency and proficiency in specific skills related to the course. It focused on practical skills that were essential for the field of study.

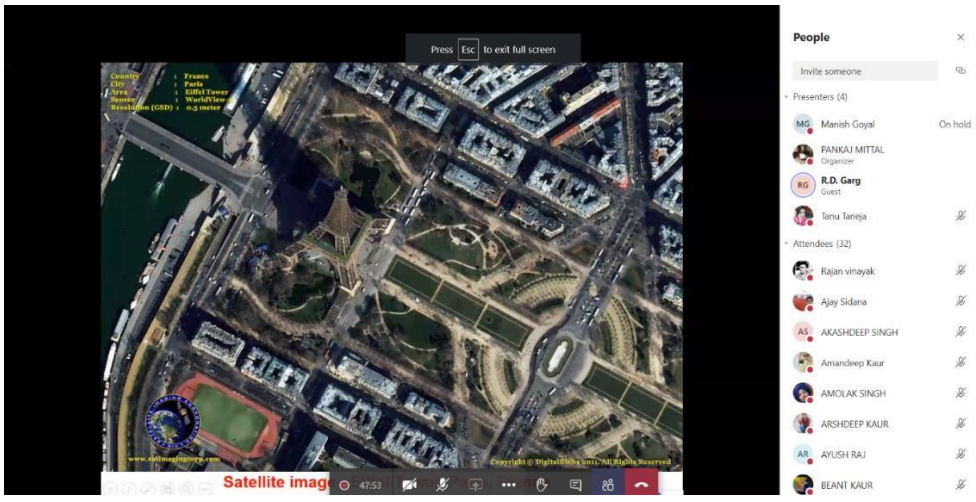
4. Attendance (10 marks):

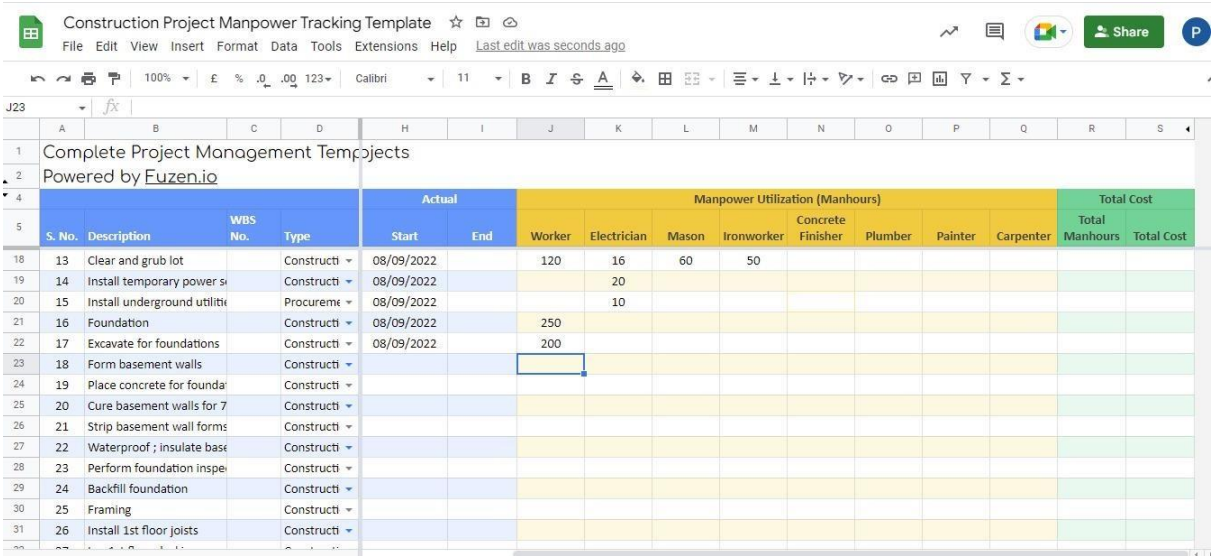
Attendance refers to the student's regular presence in the course. It emphasizes the importance of active participation and consistent engagement throughout the duration of the program.

Outcomes:

Upon completion of the course, students achieved the following outcomes:

1. They developed a strong foundation in project management concepts, gaining a solid understanding of project management principles and techniques specifically tailored to the planning and execution of construction projects.
2. They became proficient in network analysis tools, learning to utilize these tools for accurate cost and time estimation, which enabled them to effectively plan and manage construction projects.
3. They gained competence in project planning, acquiring the skills necessary to create comprehensive financial and operational plans for construction projects, taking into consideration various factors such as resource allocation and task dependencies.
4. They developed the ability to create schedules, creating detailed project schedules using appropriate tools, which facilitated effective project execution and resource management.
5. By achieving these outcomes, students were well-prepared to excel in the planning and execution of construction projects.





Construction Project Manpower Tracking Template

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Complete Project Management Tempojects

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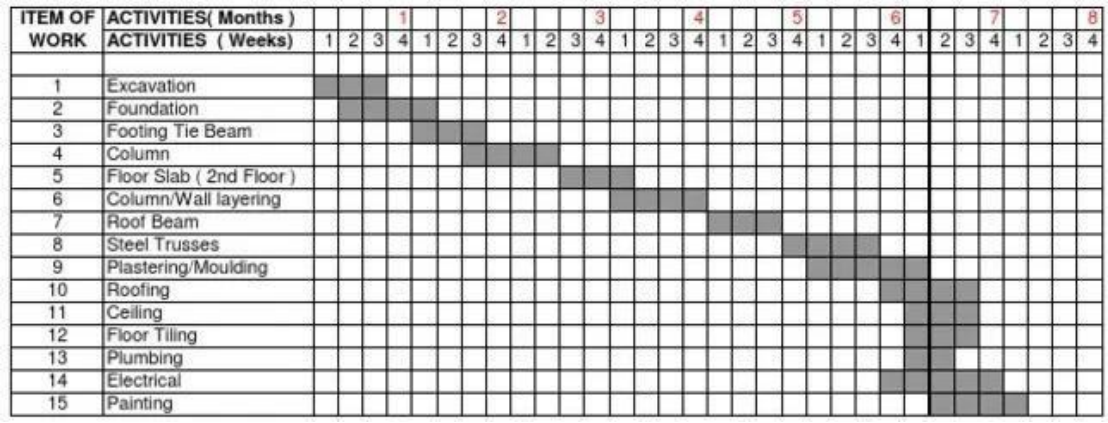
	S. No.	Description	WBS No.	Type	Actual Start	Actual End	Manpower Utilization (Manhours) Worker	Electrician	Mason	Ironworker	Concrete Finisher	Plumber	Painter	Carpenter	Total Cost Total Manhours	Total Cost
18	13	Clear and grub lot		Constructi	08/09/2022		120	16	60	50						
19	14	Install temporary power s		Constructi	08/09/2022			20								
20	15	Install underground utilitie		Procureme	08/09/2022			10								
21	16	Foundation		Constructi	08/09/2022		250									
22	17	Excavate for foundations		Constructi	08/09/2022		200									
23	18	Form basement walls		Constructi												
24	19	Place concrete for founda		Constructi												
25	20	Cure basement walls for 7		Constructi												
26	21	Strip basement wall forms		Constructi												
27	22	Waterproof ; insulate base		Constructi												
28	23	Perform foundation inspe		Constructi												
29	24	Backfill foundation		Constructi												
30	25	Framing		Constructi												
31	26	Install 1st floor joists		Constructi												



ITEM OF WORK	ACTIVITIES(Months) / ACTIVITIES (Weeks)	1				2				3				4				5				6				7				8			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	Excavation																																
2	Foundation																																
3	Footing Tie Beam																																
4	Column																																
5	Floor Slab (2nd Floor)																																
6	Column/Wall layering																																
7	Roof Beam																																
8	Steel Trusses																																
9	Plastering/Moulding																																
10	Roofing																																
11	Ceiling																																
12	Floor Tiling																																
13	Plumbing																																
14	Electrical																																
15	Painting																																

Screenshots of Excel sheets prepared by students for planning and execution ofconstruction projects

Report

on

Integrated waste management for a smart city

Eligible Students: B.Tech. 5th Semester

Date: 18-08-2020 to 03-11-2020

Duration of Course: 32 Hours

Course Code: CC_IWM

No. of students Enrolled: 29

Timing: 02.35-04.00

Days: Tuesday & Thursday

Course Coordinator: Er. Priya Mittal, Assistant Professor (CE)

The Integrated Waste Management course focused on evaluating the physical and mechanical properties of construction materials to ensure they meet safety, durability, and performance standards. It provided an understanding of the interactions and influences of various ingredients, such as cement, water, aggregates, and admixtures, on the properties of concrete. The course emphasized the importance of proper material use to create strong, durable, and cost-effective concrete structures.

Overall, the Integrated Waste Management course provided students with the necessary knowledge and skills to contribute to effective waste management strategies in a smart city environment. It is worth mentioning that a total of 29 participants were awarded certificates upon successful completion of the program.

Teaching Pedagogy:

The course comprised four modules covering different aspects of waste management., introduced solid waste management including municipal solid waste (MSW) characteristics, quantities, and regulations, explored MSW collection, transportation, segregation, and processing, focused on waste disposal methods including landfilling, biochemical processes, composting, and energy recovery. This course also provided an overview of construction and demolition (C&D) waste management addressing regulations, beneficial reuse, and challenges.

Topics Covered:

The modules covered in this course are as follows:

Module-1 Introduction to Solid Waste Management

- Municipal Solid Waste (MSW) Characteristics and its Quantities
- MSW rules 2016
- Swachh Bharat Mission
- Smart Cities Program

Module-2 Municipal Solid Waste Characteristics and Quantities

- Municipal Solid Waste Collection
- Transportation and Segregation
- Processing of solid waste

Module-3 Disposal of Municipal Solid Waste

- Municipal Solid Waste Disposal
- Waste Disposal of Landfill
- Biochemical Process and Composting
- Energy Recovery from Municipal Solid Waste

Module-4 Construction and Demolition (C&D) Waste Management

- C&D Waste – Regulation
- Beneficial Reuse of C&D Waste Materials

Assessment Procedure:

The students were evaluated throughout the course based on four parameters: Technical Knowledge, Hands-on Practice, Skill Test, and Attendance. Each parameter carried a certain weightage in the overall evaluation.

1. Technical Knowledge in Concerned Field (20 marks):

This parameter measured their theoretical knowledge, conceptual understanding, and ability to apply that knowledge to practical scenarios.

2. Hands-on Practice (10 marks):

Hands-on practice evaluated the student's ability to apply their knowledge in practical situations. It measured their proficiency in utilizing tools, techniques, or software relevant to the course.

3. Skill Test (10 marks):

The skill test assessed the student's competency and proficiency in specific skills related to the course. It focused on practical skills that were essential for the field of study.

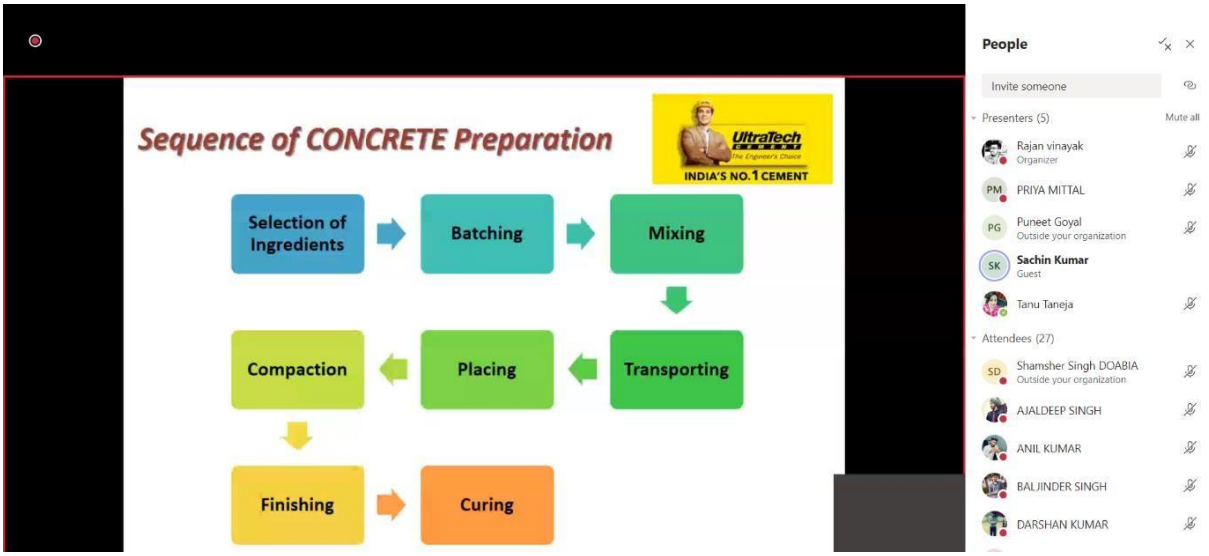
4. Attendance (10 marks):

Attendance refers to the student's regular presence in the course. It emphasizes the importance of active participation and consistent engagement throughout the duration of the program.

Outcomes:

The course outcomes can be summarized as follows:

1. Students learned how to prevent, recycle, and manage solid waste in ways that effectively protected human health and the environment.
2. In the course, students learned how to work in teams to perform experimental tasks.
3. They verified the assumptions made in the study of waste prevention, recycling, composting, and disposal program.
4. At the end of this course, students were provided with a project which aimed to equip students with knowledge and skills to contribute to effective waste management strategies in a smart city environment.



Screenshots of Effective concrete preparation steps

Report

on

Remote sensing and GIS

Eligible Students: B.Tech. 3rd Semester

Date: 18-08-2020 to 17-11-2020

Duration of Course: 32 Hours

Course Code: CC_RS

No. of students Enrolled: 29

Timing: 01.50-03.20

Days: Tuesday & Thursday

Course Coordinator: Er. Rajan Vinayak, Assistant Professor (CE)

This course provides an overview of remote sensing and GIS (Geographic Information System) and their applications in various fields. It explains that remote sensing involves gathering information about the Earth's surface, atmosphere, and oceans using sensors on aircraft, satellites, or other platforms. GIS, on the other hand, is a technology used to store, manage, analyze, and visualize geographic data. The report highlights the importance of these technologies in studying environmental phenomena, natural resources, and human activities.

Overall, the course successfully imparted knowledge and skills related to remote sensing and GIS. The positive feedback from the students indicates their satisfaction with the course content and teaching methodology. It is worth mentioning that a total of 29 participants were awarded certificates upon successful completion of the course.

Teaching Pedagogy:

The course is divided into three modules, each focusing on Remote Sensing Data and Corrections, Digital Image Processing, and Geographic Information System (GIS). Students were introduced to remote sensing data, image corrections, and digital image processing techniques. They also learned about GIS and its applications.

Topics Covered:

The modules covered in this course are as follows:

Module-1 Introduction to Remote Sensing Data and Corrections

- Remote Sensing Data and Corrections
- Satellite Image Corrections

Module-2 Introduction to Digital Image Processing

- Digital Image Processing-I
- Digital Image Processing-II
- Thermal and Microwave

Module-3 Introduction to Graphical Information System (GIS)

- Imaging Spectroscopy-I
- Imaging Spectroscopy-II
- GIS-I, GIS-II and Application

Assessment Procedure:

The students were evaluated throughout the course based on four parameters: Technical Knowledge, Hands-on Practice, Skill Test, and Attendance. Each parameter carried a certain weightage in the overall evaluation.

1. Technical Knowledge in Concerned Field (20 marks):

This parameter measured their theoretical knowledge, conceptual understanding, and ability to apply that knowledge to practical scenarios.

2. Hands-on Practice (10 marks):

Hands-on practice evaluated the student's ability to apply their knowledge in practical situations. It measured their proficiency in utilizing tools, techniques, or software relevant to the course.

3. Skill Test (10 marks):

The skill test assessed the student's competency and proficiency in specific skills related to the course. It focused on practical skills that were essential for the field of study.

4. Attendance (10 marks):

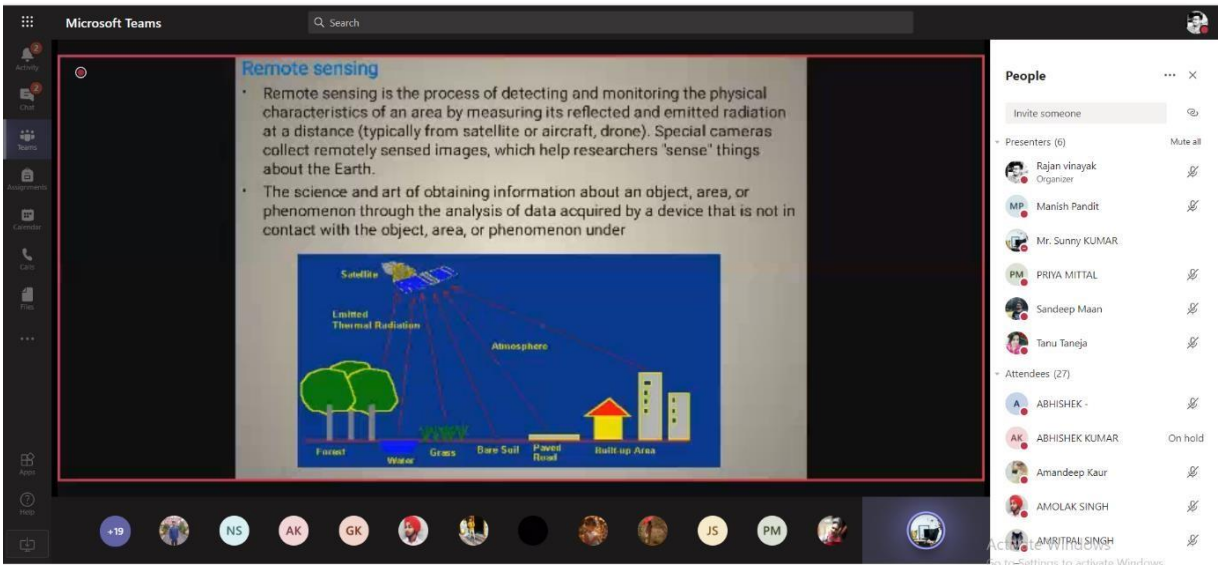
Attendance refers to the student's regular presence in the course. It emphasizes the importance of active participation and consistent engagement throughout the duration of the program.

Outcomes:

The following outcomes were achieved during the course:

1. Students gained knowledge about the principles and components involved in remote sensing.

2. Students learned to visually and digitally analyze images using various digital image processing techniques.
3. Students explored the application of remote sensing and GIS in different civil engineering projects.
4. They learned how these technologies can be utilized in areas such as urban planning and environmental management.
5. Students gained proficiency in converting analog data to digital format and working with GIS software. They learned to handle geographic data related to demographics, land use, elevation, climate, natural resources, and infrastructure.



Glimpses of the sessions for converting analog data to digital format

Report

on
Wear in Engineering

Eligible Students: B.Tech. 7th Semester

Date: 10-08-2020 to 14-10-2020

Duration of Course: 32 Hours

Course Code: CC_WE

No. of Students Enrolled in the course: 27

Timing: 11:30 am to 01:05 pm

Days: Monday & Wednesday

Course Coordinator: Er. Indraj Kumar

Wear in Engineering course conducted during the session 2019-20 for B.Tech. students. This certificate course delves into the fascinating field of engineering materials and the critical role they play in various industries. This course explored the science behind wear, friction, and lubrication to ensure the efficient functioning and longevity of mechanical systems. The course duration was 32 hours, where 27 enrolled students successfully completed the course. Throughout this course, the students examined the fundamental concepts of wear, including the different types of wear mechanisms, such as adhesive, abrasive, erosive, and corrosive wear. Students determined the factors influencing wear, such as contact pressure, sliding velocity, temperature, and surface roughness, and learn how to mitigate wear through various engineering strategies.

Teaching Pedagogy:

The Wear in Engineering course employs a diverse range of teaching pedagogies to create an engaging and interactive learning experience. Through comprehensive lectures, real-world case studies, hands-on experiments, group discussions, multimedia resources, guest lectures, assignments, projects, and assessments, students will develop a solid understanding of the fundamental principles and practical applications of engineering wears. Online learning platforms will complement these methods, providing additional resources and facilitating collaborative learning. By combining theory, practical experimentation, and industry insights,

this pedagogical approach aims to foster critical thinking, problem-solving skills, and the ability to analyze and optimize the performance of engineering components in the face of wear-related challenges.

Topics Covered:

MODULE-1: Introduction to Engineering Wear

The module provides an overview of engineering wear and its significance in design and industrial applications. It covers topics such as viscosity, flow of fluids, and the nature of surfaces in contact. Participants will learn about the properties of surface layers, methods of studying surfaces, and the contact behavior of smooth and rough surfaces.

MODULE-2: Wear and its Potential Reasons

The module focuses on the causes and morphology of wear. It discusses design issues, friction in upper and lower pairs, and different types of friction. Participants will explore the definition, mechanisms, and measurement of wear, as well as the theories associated with wear phenomena. The module also covers wear of materials and the impact of friction on wear.

MODULE-3: Introduction to ASTM and Various Codes

The Module introduces the American Society for Testing and Materials (ASTM) and various codes related to wear. It presents case studies of wear occurring in fields such as agricultural tillage and industrial production, including the airline industry. The module explores remedial measures for mechanical wear through metallurgical processes. Participants will also learn about bearing selection, lubrication, maintenance, and diagnostic considerations in different tribological components.

MODULE-4: Lubrication and Lubricants

The module focuses on lubrication and lubricants. It covers the principles of lubrication and the general requirements of bearing materials. Participants will learn about different types of bearing materials and their applications. The module delves into hydrostatic step bearings, hydrodynamic theory of lubrication, friction in sliding bearings, and hydrodynamic thrust bearings. Additionally, participants will gain an understanding of lubricant functions, types, properties, and selection criteria, as well as the classification, recycling, and disposal of oils.

Assessment Procedure:

The students were evaluated throughout the course based on four parameters: Technical

Knowledge, Hands-on Practice, Skill Test, and Attendance. Each parameter carried a certain weightage in the overall evaluation.

1. **Technical Knowledge in Concerned Field (20 marks):**
   This parameter measured their theoretical knowledge, conceptual understanding, and ability to apply that knowledge to practical scenarios.

2. **Hands-on Practice (10 marks):**
   Hands-on practice evaluated the student's ability to apply their knowledge in practical situations. It measured their proficiency in utilizing tools, techniques, or software relevant to the course.

3. **Skill Test (10 marks):**
   The skill test assessed the student's competency and proficiency in specific skills related to the course. It focused on practical skills that were essential for the field of study.

4. **Attendance (10 marks):**
   Attendance refers to the student's regular presence in the course. It emphasizes the importance of active participation and consistent engagement throughout the duration of the program.

Outcome:

1. Knowledge of Surface Topography: Students acquired the ability to understand and model the surface topography of engineering materials, allowing them to analyze and predict wear behavior based on surface roughness and contact conditions.
2. Understanding of Tribology Basics: Students developed a comprehensive understanding of the fundamental principles of tribology and related sciences. They grasped the theoretical background of processes occurring in tribological systems and the various mechanisms and forms of interaction between friction surfaces.
3. Familiarity with Types of Wear: Students became familiar with different types of wear mechanisms, including adhesive, abrasive, erosive, and corrosive wear. They understood the underlying mechanisms of each type and recognized the factors that influence wear behavior in various engineering systems.
4. Methods to Reduce Friction: Students learned various methods to reduce friction in engineering systems, such as surface coatings, lubrication strategies, and surface

treatments. They acquired the skills to identify friction-related problems and implemented effective solutions to enhance the efficiency and lifespan of mechanical components.

5. Students had hands on practice on different types of wear on machine components. It was the major achievement of the certificate course.

Project on comparison of wear in gears

BABA FARID COLLEGE OF ENGG. & TECHNOLOGY

Report

on

Online Core Python

Programme/Semester: B.Tech. Computer Science & Engineering /5th

Duration of Course: 32 Hours

Date : 19-08-2020 to 08-10-2020

Course Code- CC_OCP

No. of Students Enrolled in the course: 35

Timing: 11:30 am to 01:05 pm

Days: Wednesday, Thursday & Friday

Course Coordinator: Er. Amandeep Kaur, Assistant Professor (CSE)

The course, spanning 32 hours, offered a comprehensive exploration of Python programming. With an enrollment of 35 students, all successfully completing the course, the program was facilitated by a faculty expert. Delving into various aspects of Python, the curriculum encompassed essential topics such as data types, conditional and loop statements, lists, matrices, tuples, dictionaries, functions, modules, environment setup, plotting, and Django. Through hands-on exercises and practical projects, students gained valuable experience in implementing object-oriented concepts, developing database solutions, and creating GUI applications. This course not only equipped students with foundational Python programming skills but also empowered them to extend their knowledge in the domains of IoT and ML, opening new avenues for their future endeavors.

Teaching Pedagogy:

The course employed a structured teaching pedagogy that included theoretical lectures, practical demonstrations, and hands-on coding exercises. Students were introduced to the fundamentals of Python, its setup, and important libraries. They learned about conditional and loop statements, working with lists, arrays, matrices, tuples, dictionaries, and functions. The course also covered the introduction to Python Django for web development. The guidance of experienced faculty experts ensured a well-rounded learning experience.

Topic Covered:

Module 1: Introduction to Python - Covering Python features, flavors, identifiers, data types, input functions, and command-line arguments.

Module 2: Python environment Setup Basic & working with Plots - Including environment variable setup, directory management, software installations, and library imports.

Module 3: Working with Conditional and Loop Statements - Exploring if-else statements, transfer statements, break, pass, continue, for and while loops.

Module 4: Working with List, arrays accessing and manipulation - Topics such as list introduction, accessing elements, list functions, and manipulating nested lists.

Module 5: Working with Matrix, loops, Tuples, dictionaries - Covering tuples, traversing, tuple functions, dictionary introduction, and dictionary operations.

Module 6: Working with Functions and Python modules - Introducing functions, types of arguments, recursive functions, anonymous functions, and working with modules like map(), filter(), and reduce().

Module 7: Working with Python Django - Introduction to packages, reference variables, constructors, types of variables, garbage collection, and importing and working with Django.

Assessment Procedure:

The students were evaluated throughout the course based on four parameters: Technical Knowledge, Hands-on Practice, Skill Test, and Attendance. Each parameter carried a certain weightage in the overall evaluation.

1. Technical Knowledge in Concerned Field (20 marks):

This parameter measured their theoretical knowledge, conceptual understanding, and ability to apply that knowledge to practical scenarios.

2. Hands-on Practice (10 marks):

Hands-on practice evaluated the student's ability to apply their knowledge in practical situations. It measured their proficiency in utilizing tools, techniques, or software relevant to the course.

3. Skill Test (10 marks):

The skill test assessed the student's competency and proficiency in specific skills related to

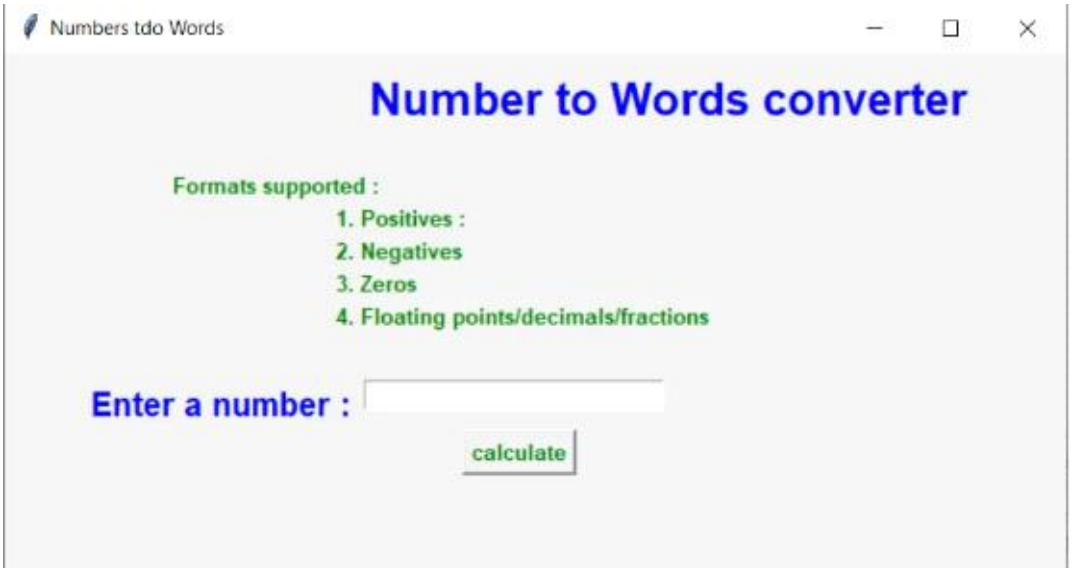
the course. It focused on practical skills that were essential for the field of study.

4. Attendance (10 marks):

Attendance refers to the student's regular presence in the course. It emphasizes the importance of active participation and consistent engagement throughout the duration of the program.

Outcome:

1. Developed a solid understanding of Python's features, syntax, and data types.
2. Acquired skills in setting up the Python environment and working with basic plots.
3. Learned to use conditional statements and loops for program control and automation.
4. Gained proficiency in manipulating lists, including accessing, adding, and removing elements.
5. Learned to work with tuples and dictionaries for effective data storage and organization.



Python Project on Number to words converter

Report

on

Advanced Data Structures and Programming

Eligible Students: B.Tech 7th Semester

Duration of Course: 32 Hours

Date: 18-08-2020 to 27-10-2020

Course Code- CC_ADSP

No. of Students Enrolled in the course: 35

Timing: 01:50 pm to 03:20 pm

Days: Tuesday & Friday

Course Coordinator: Er. Ankit Sharma, Assistant Professor (CSE)

This Advanced Data Structures and Programming course, offered during the B.Tech 7th semester, spanned 32 hours of instruction. Under the guidance of faculty experts, it provided students with an in-depth understanding of advanced data structures and their implementation in programming. The course focused on equipping students with the necessary knowledge and skills, under the guidance of faculty experts, to efficiently handle complex data and develop robust algorithms. With a strong emphasis on practical applications, this course aimed to enhance the students' problem-solving abilities and computational thinking. The course had 35 students enrolled, all of whom successfully completed the course.

Teaching Pedagogy:

The course incorporated a diverse range of teaching methodologies to ensure an engaging and effective learning experience. Through a blend of interactive lectures, practical demonstrations, and hands-on exercises, students were immersed in the world of data structures. Theoretical lectures provided a solid theoretical foundation, delving into topics such as algorithm analysis, complexity, and the implementation of various data structures. Practical demonstrations allowed students to witness real-world applications and gain insights into the practical aspects of data structure implementation. Additionally, hands-on exercises provided students with the opportunity to apply their knowledge, solve coding problems, and strengthen their programming skills. Continuous assessments and feedback helped gauge the

understanding and progress of students, ensuring a comprehensive learning journey under the guidance of experienced faculty experts.

Topic Covered:

Module 1: Introduction of algorithm analysis: Basic terminologies, algorithm analysis of operations, recurrence, and recursion tree method.

Module 2: Algorithm Complexity: Asymptotic analysis, performance measurements, analysis of recursive algorithms.

Module 3: Stacks & Queues implementation: ADT stack and its operations, applications, ADT queue, types of queues, and their operations.

Module 4: Linked List and its types: Singly linked lists, doubly linked lists, circular linked lists, operations, and complexity analysis.

Module 5: Implementation of Binary tree and binary search tree: Tree terminologies, binary search trees, operations, and complexity analysis.

Module 6: Implementation of Graph and sorting algorithms: Sorting algorithms, graph terminologies, graph search, and traversal algorithms.

Assessment Procedure:

The students were evaluated throughout the course based on four parameters: Technical Knowledge, Hands-on Practice, Skill Test, and Attendance. Each parameter carried a certain weightage in the overall evaluation.

1. Technical Knowledge in Concerned Field (20 marks):

This parameter measured their theoretical knowledge, conceptual understanding, and ability to apply that knowledge to practical scenarios.

2. Hands-on Practice (10 marks):

Hands-on practice evaluated the student's ability to apply their knowledge in practical situations. It measured their proficiency in utilizing tools, techniques, or software relevant to the course.

3. Skill Test (10 marks):

The skill test assessed the student's competency and proficiency in specific skills related to the course. It focused on practical skills that were essential for the field of study.

4. Attendance (10 marks):

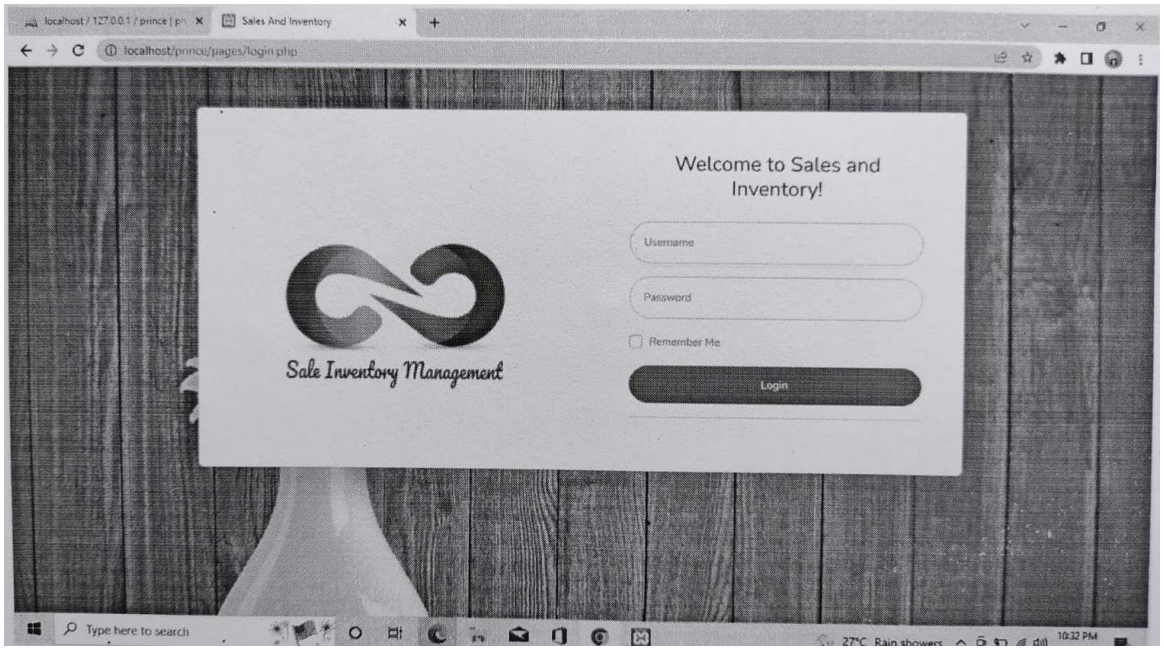
Attendance refers to the student's regular presence in the course. It emphasizes the importance

of active participation and consistent engagement throughout the duration of the program.

Outcome:

1. Comprehensive Understanding: Students gained a comprehensive understanding of data structures, including their implementation, analysis, and applications in various programming scenarios.
2. Problem-Solving Skills: Students developed strong problem-solving skills by applying data structures to solve coding problems and algorithmic challenges. They learned to choose appropriate data structures and apply efficient algorithms to optimize program performance.
3. Practical Application: Through hands-on practice sessions, students acquired practical skills in implementing data structures and gained experience in solving real-world programming problems.
4. Analytical Thinking: The course fostered analytical thinking by teaching students to analyze the complexity of algorithms, evaluate trade-offs, and make informed decisions in selecting and implementing data structures.
5. Collaboration and Communication: Students enhanced their collaboration and communication skills by working on group projects and participating in discussions related to data structure concepts, algorithms, and their implementations.
6. Continuous Learning: The course instilled a thirst for continuous learning and exploration of advanced data structures, enabling students to adapt to emerging technologies and stay updated with the latest trends in the field.

Overall, the course equipped students with a solid foundation in data structures, empowering them to design efficient algorithms, write optimized code, and solve complex programming problems in their future endeavors.



Screenshot of Project Sales and Inventory System

Report

on

Design of Photovoltaic System

Eligible Students: B.Tech 5th Semester

Date: 20-08-2020 to 05-11-2020

Duration of Course: 32 Hours

Course Code: CC_DPS

No. of students Enrolled: 34

Timing: 1:50 PM-3.20 PM

Days: Monday & Thursday

Course Coordinator: Er. Satvir Singh, Assistant Professor (EE)

The report provides a summary of the course on the design of photovoltaic systems, conducted for eligible students of B.Tech. 5th Semester. The course aimed to equip students with knowledge and skills related to solar photovoltaic technology, its applications, and the design of autonomous and grid-connected photovoltaic systems. The course duration was 32 hours, conducted from 20/08/2020 to 05/11/2020, with classes held on Mondays and Thursdays from 1:50 PM to 3:20 PM. All the enrolled students had successfully completed the course.

The course provided students with a strong foundation in solar photovoltaic technology, enabling them to design and analyze photovoltaic systems effectively. Through theoretical learning and practical exercises, the students gained knowledge about PV cells, sizing techniques, maximum power point tracking, interfacing methods, and life cycle costing. The acquired skills and knowledge will prepare the students for future engineering projects and contribute to their understanding of renewable energy systems.

Teaching Pedagogy:

The course followed a structured approach with six modules. They provided an introduction to PV cells, the estimation of incident energy, the sizing of PV systems, concept of maximum power point tracking (MPPT), PV-battery interfaces, cooling approaches, different interfacing methods, interfacing methodologies, life cycle costing, and the basic engineering project related to energy supply using solar PV technology.

Topics Covered:

The course covered several modules, enabling students to gain comprehensive knowledge and skills in designing photovoltaic systems. The modules included:

Module 1: PV Cell Incident Energy Estimation - Introduction to PV cells, basic concepts, and understanding incident energy.

Module 2: Sizing PV, Maximum Power Point Tracking - Concept of sizing PV systems, methods for achieving maximum power point tracking.

Module 3: MPPT Algorithms - Exploration of different algorithms used for maximum power point tracking.

Module 4: PV-Battery Interfaces, Peltier Cooling - Understanding different interfacing methods for PV-battery systems, approaches to cooling.

Module 5: PV and Water Pumping, PV-Grid Interface-I - Different methodologies for PV-water pumping systems, interfacing PV systems with the grid.

Module 6: Interface-II and Life Cycle Costing - Basics of life cycle analysis, various interfacing methods and approaches.

Assessment Procedure:

The students were evaluated throughout the course based on four parameters: Technical Knowledge, Hands-on Practice, Skill Test, and Attendance. Each parameter carried a certain weightage in the overall evaluation.

1. Technical Knowledge in Concerned Field (20 marks):

This parameter measured their theoretical knowledge, conceptual understanding, and ability to apply that knowledge to practical scenarios.

2. Hands-on Practice (10 marks):

Hands-on practice evaluated the student's ability to apply their knowledge in practical situations. It measured their proficiency in utilizing tools, techniques, or software relevant to the course.

3. Skill Test (10 marks):

The skill test assessed the student's competency and proficiency in specific skills related to the course. It focused on practical skills that were essential for the field of study.

4. Attendance (10 marks):

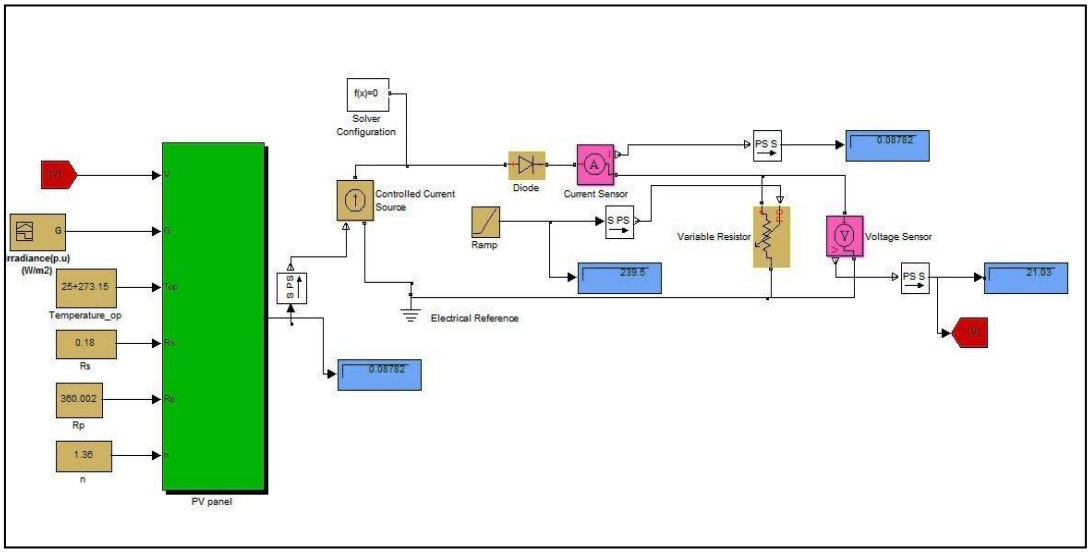
Attendance refers to the student's regular presence in the course. It emphasizes the importance of active participation and consistent engagement throughout the duration of the program.

Outcome:

Upon completion of the course, the students achieved the following learning outcomes:

1. Acquired knowledge about the relevant organizations, international projects, and regulations related to solar photovoltaic technology.
2. Developed the ability to specify, analyze, and design (size) autonomous photovoltaic systems and grid-connected photovoltaic systems.
3. Learned to analyze the behavior of self-consumption demand and understand network management in photovoltaic systems.
4. Enhanced their understanding of the role of electrical systems in various industries and their application in real-world engineering projects based on solar PV.

In conclusion, the course on the design of photovoltaic systems successfully delivered the intended learning outcomes to eligible B.Tech. 5th Semester students. The course coordinator, Er. Satvir Singh, and the teaching team employed effective teaching pedagogy to impart theoretical knowledge and practical skills. The positive feedback received from the students validates the course's success in enhancing their understanding of solar photovoltaic technology and its applications.



Screenshot of Project on Photovoltaic Panel Model in MatLab Simulink

BABA FARID COLLEGE OF ENGG. & TECHNOLOGY

Report

on

Online Course on Industrial Automation with PLC & SCADA

Eligible students: B.Tech. Semester

Date: 28/08/2020 to 29/10/2020

Duration of Course: 32 Hours

Course Code: CC_PLC&S

No. of Students Enrolled: 32

Timing: 1:50 to 3:20

Days: Monday & Thursday

Course Coordinator: Er. Dinseh, Assistant Professor

The Certificate Course on Industrial Automation with PLC & SCADA provided students with comprehensive knowledge of PLC and SCADA systems used in various industries for process automation. PLCs are physical hardware devices, while SCADA is software. The course covered the basics of PLC and SCADA, their components, and the role they play in industrial automation. It also introduced different types of SCADA systems and the programming languages used in SCADA programming. The duration of the course was 32 hours, and 30 enrolled students successfully completed the course.

Teaching Pedagogy:

The teaching pedagogy employed in the Certificate Course on Industrial Automation with PLC & SCADA focused on a combination of theoretical knowledge and practical hands-on experience. The instructors utilized a student-centered approach, encouraging active participation and engagement throughout the course. They delivered lectures to introduce the concepts and theories, supplemented with visual aids and real-life examples to enhance understanding. The students were provided with PLC trainer devices and software to gain practical experience in programming and operating PLC systems. Regular skill tests and assessments were conducted to gauge the students' progress and understanding. The instructors fostered a supportive learning environment, encouraging questions, discussions, and collaborative problem-solving. Overall, the teaching pedagogy aimed to ensure t hat students not only acquired theoretical knowledge but also developed the skills and confidence to apply their learning in real-world scenarios.

Topic Covered:

Module 1: Introduction to PLC and PLC Wiring

Students learned about the basics of PLCs, their components, and the installation process. The module also covered PLC I/O module installation, wiring considerations, and recommended procedures for wiring. Students were familiarized with wire sizing, labeling, and bundling techniques.

Module 2: How PLC Ladder Logic Programming Works

This module focused on the programming aspect of PLCs, specifically ladder logic programming. Students learned about special I/O connection precautions, handling leaky inputs, suppressing inductive loads, and fusing outputs. The module also covered ladder logic programming, with a specific focus on Allen Bradley PLCs.

Module 3: Introduction to PLC Trainer Device and PLC Software

Students were introduced to PLC trainer kits and their main components. They gained hands-on experience with PLC software and learned about its different features and objectives.

Module 4: Fundamental Commands of PLC

This module covered the fundamental commands used in PLC programming. Students learned about input and output commands, relay logic, and commonly used logic symbols such as XIC, XIO, PTS, and NTS.

Assessment Procedure:

The students were evaluated throughout the course based on four parameters: Technical Knowledge, Hands-on Practice, Skill Test, and Attendance. Each parameter carried a certain weightage in the overall evaluation.

1. Technical Knowledge in Concerned Field (20 marks):

This parameter measured their theoretical knowledge, conceptual understanding, and ability to apply that knowledge to practical scenarios.

2. Hands-on Practice (10 marks):

Hands-on practice evaluated the student's ability to apply their knowledge in practical situations. It measured their proficiency in utilizing tools, techniques, or software relevant to the course.

3. Skill Test (10 marks):

The skill test assessed the student's competency and proficiency in specific skills related to the course. It focused on practical skills that were essential for the field of study.

4. Attendance (10 marks):

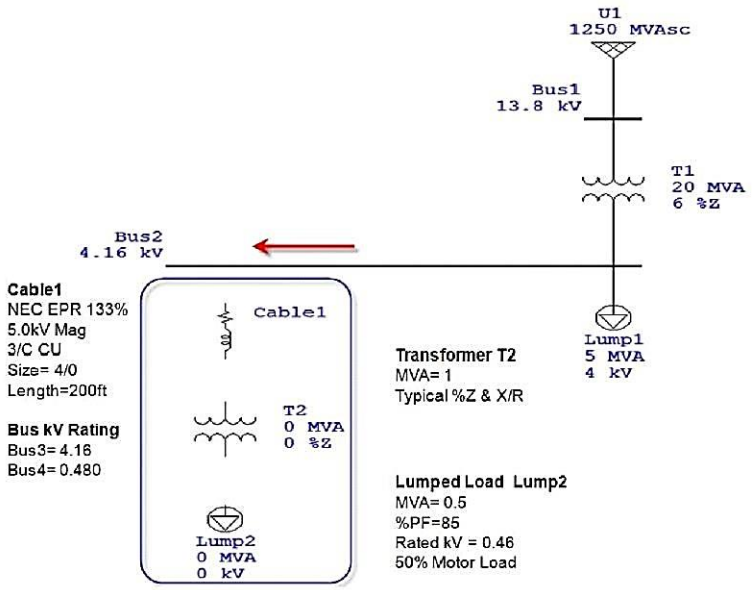
Attendance refers to the student's regular presence in the course. It emphasizes the importance of active participation and consistent engagement throughout the duration of the program.

Outcome:

Upon completion of the course, students achieved the following learning outcomes:

- Understanding of PLC Components: Students gained the ability to describe the typical components of a Programmable Logic Controller (PLC) and explain their functions.
- Basic Concepts of PLC: Students acquired a clear understanding of the basic concepts and terminology associated with PLCs, enabling them to discuss and apply PLC principles effectively.
- Electrical Ladder Logic: Students developed proficiency in explaining and applying the concept of electrical ladder logic, understanding its historical significance and its relationship to programmed PLC instructions.
- Basic Digital Electronics and Data Manipulation: Students learned the fundamentals of digital electronics and data manipulation, enabling them to analyze and manipulate data within a PLC system.

Overall, the course provided students with a solid foundation in industrial automation with PLC and SCADA systems. They gained the practical skills, technical knowledge, and problem-solving abilities necessary to excel in the field of industrial automation.



Screenshot of Project on Modeling and Load Flow Analysis of a Small Power System in ETAP Software