**SCMS SCHOOL OF ENGINEERING AND TECHNOLOGY**

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# CRITERIA 1

## CURRICULAR ASPECTS

## 1.2: Academic Flexibility

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# 1.2.1/1.2.2 Number of Certificate/Value added courses offered and online courses of MOOCs, SWAYAM, NPTEL etc.

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# BROCHURE

# AND

# COURSE PLAN

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# Add on /Certificate/Value added programs and Online MOOC programs like NPTEL, Swayam

## 2021-22

| Sl. No | Name of the Add on /Certificate/Value added programs and Online MOOC programs like NPTEL, Swayam | Course code |
|---|---|---|
| 1 | Soft skills for Engineers | CES2122S01 |
| 2 | Liquid Waste Management Under SBM 2.0 | CLW2122S02 |
| 3 | 3D Printing and Design | CPD2122SO3 |
| 4 | Arduino Programming Using MATLAB/Simulink | CAM2122SO4 |
| 5 | Cybersecurity Essentials | CCE2122S05 |
| 6 | Microsoft AI | CMA2122S06 |
| 7 | Ansys and Creo | CAC2122S07 |
| 8 | Personality Development for Engineers | CPE2122S08 |
| 9 | Internet of things | CIT2122S09 |
| 10 | CNC Lathe | CCL2122S10 |
| 11 | Essential Concepts in C Programming | CEP2122S11 |
| 12 | Foundation Engineering | NPT2122S01 |
| 13 | Glass in buildings: Design and Applications | NPT2122S02 |
| 14 | Modern Construction Materials | NPT2122S03 |
| 15 | Remote Sensing: Principles and Applications | NPT2122S04 |

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## VALUE ADDED COURSE

**ON**

# Soft Skills for Engineers

CONDUCTED BY

Basic Science and Humanities Department, SSET

Forenoon session: 9:00 am-12:00pm (3 hours)
Afternoon session: 1:00 pm - 4:00 pm (3 hours)
Total: 30 hours (6 hours per day)

Course dates:
17/4/22, 24/4/22, 1/5/22, 8/5/22, 15/5/22, 22/5/22

# Soft skills for Engineers

Course duration: 30 hours

Course Coordinator: Ms. Reshma R.

## Course Description

The course on Education soft skills include the topics in communication skills required for a graduate student. The course will cover the topics - Decision Making & Problem Solving Skills, Exercise in Problem Solving Skills, Self-management and Professionalism Skills, Emotional Intelligence. The course will focus on developing self-motivation, raised aspirations and belief in one's own abilities, defining and committing to achieving one's goals etc. Through this course, the student will improve their confidence and enthusiasm for learning, responsibility – for one's self, learning self-reliance and independence.

## Course Objectives

- Develop effective communication skills
- Develop effective presentation skills
- Develop all-round personality with a mature outlook to function effectively in different circumstances.

## Course Outcomes

After completing the course, students will be able to:

- Learn how to improve Resilience – learning to keep going when things don't go according to plan, coping with the unfamiliar, managing disappointment and dealing with conflict
- Teamwork – learning to connect and work with others to achieve a set task
- Leadership – assessing the requirements of a task, identifying the strengths within the team, utilising the diverse skills of the group to achieve the set objective, awareness of risk/safety
- Communication – demonstrating clear briefing and listening skills, not being afraid to ask for help and support when necessary

**Assessment Pattern**

Two assignments of 15 marks each

Final Assessment exam -50 marks, passed with a minimum of 20 marks
Viva-20 marks

Certificates will be awarded to students who completed the course with a minimum of 40 marks (total score) and a minimum of 20 marks in final exam. Minimum 75% attendance is mandatory to get the certificate.

## Syllabus

**Course Content:**

## Module 1

**Communication Skills & Related Soft Skills:** Barriers to Communication, Communication Styles Questionnaire, Negotiations Preparation Tool, Presenting to a Group Checklist, Quiz - Building Rapport

## Module 2

**Decision Making & Problem Solving Skills:** Creativity, Critical Thinking, Decision Making, Problem Solving

## Module 3

**Exercise in Problem Solving Skills**
Creativity Suggested Actions to Boost Creativity, Creativity Quotes, Critical Thinking Exercise - Critical Thinking Decision Making Expand all sections First Things First Introduction C

## Module 4

**Self-management and Professionalism Skills:** Resourcefulness, Adaptability & Flexibility, Attitude, Character, Character Strengths, Compassion, Focus, Grit, Growth Mindset

## Module 5

**Emotional Intelligence:** Overview of Emotional Intelligence, Emotional Intelligence & Career Impact, Can Emotional Intelligence Be Improved, The 4 Elements of Emotional Intelligence, Leadership & Emotional Intelligence, Who Could Benefit from EI Skill Enhancement, Other Soft Skills

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Reshma. R
Course Coordinator

HOD

Principal

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# Add on Course on

# Liquid Waste Management Under SBM 2.0

CONDUCTED BY

## DEPARTMENT OF CIVIL ENGINEERING

Forenoon session: 9:00 am-12:00pm (3 hours)
Afternoon session: 12:30 pm - 3:30 pm (3 hours)
Total: 30 hours (6 hours per day)

Course Date:
23/5/2022-27/5/22

# Add on course on

# Liquid Waste Management Under SBM 2.0

Course duration: 30 hours

Course Coordinator: Ratish Menon

## Course Description

*Types of Wastes-Liquid and Solid waste*

*Potential danger of waste generation in our society*

*Liquid waste management and treatment*

*Mobile treatment units for liquid waste disposal*

## Course Objectives

- **To impart knowledge about different types of wastes and their potential danger**
- **To deliver various treatment methods for treating solid wastes**
- **To deliver various treatment and disposal methods for liquid wastes**

## Course Outcomes

After completing the course, students will be able to:

- Differentiate different types of solid and liquid wastes and their constituents
- Identify suitable methods to treat and dispose solid and liquid waste

**Assessment Pattern**

Two assignments of 15 marks each

Final Assessment exam -50 marks, passed with a minimum of 20 marks
Viva-20 marks

Certificates will be awarded to students who completed the course with a minimum of 40 marks (total score) and a minimum of 20 marks in final exam. Minimum 75% attendance is mandatory to get the certificate.

## Syllabus

### Module 1 (6 hours)

*Types of Wastes-Liquid and Solid waste*

### Module 2 (6 hours)

*Potential danger of waste generation in our society*

### Module 3 (6 hours)

*Liquid waste management and treatment*

### Module 4 (6 hours)

*Mobile treatment units for liquid waste disposal*

### Module 5 (6 hours)

How to decrease pollution in our country in a sustainable manner

Course Coordinator

Dr. Ratish Menon

HOD

Dr. Nisha L

Principal

Dr. Praveensal C J

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**ADD ON COURSE**

**ON**

# 3D Printing and Design

CONDUCTED BY

## DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

Forenoon session: 9:00 am-12:00pm (3 hours)

Afternoon session: 12:30 pm - 3:30 pm (3 hours)

Total: 30 hours (6 hours per day)

**Course Date:**

23/11/2021 - 27/11/2021

**Assessment Pattern**

Two assignments of 15 marks each

Final Assessment exam -50 marks, passed with a minimum of 20 marks
Viva-20 marks

Certificates will be awarded to students who completed the course with a minimum of 40 marks (total score) and a minimum of 20 marks in final exam. Minimum 75% attendance is mandatory to get the certificate.

# 3D Printing and Design

Course duration: 30hrs

Course Coordinator: Dr. Parvathy M

## Course Description

A five-day course on 3D Printing was organized for ECE students by Department of Electronics and Communication Engineering in association with IEDC SSET under the coordination of Dr. PARVATHY.M (Assoc. Professor, ECE Dept.). This Five- day course was conducted from 23rd November to 27th November 2021 in offline mode. Sixty-Nine students registered and participated for this workshop. The contents o f this course was designed to meet the gap in syllabus for the subject ECT342 Embedded Systems.

## Course Objectives:

To familiarize with the 3D printing technologies and to undergo Onshape software training to get ability to deal with real life issues.

## Course Outcome:

At the end of this course, you will be able to create awareness about the

- State-of-the-Art of 3D printing Techniques
- Basic Components & Assembly of 3D Printing Techniques
- Selection of Materials for 3D Printing
- Mechanical and Metallurgical Properties of 3D Printed materials
- Creation of Different Shapes and Objects in Onshape Software

## Syllabus:

**Course Content:**

**Module 1**

**Introduction to 3D Printing**

- 3D Printing- Key Elements and Definition
- 3D Printing versus Conventional Manufacturing
- Working Principle of 3D Printer
- Need of 3D Printing in Industrial Applications

- Post Processing Requirements and Techniques
- Sustainable Aspects of 3D Printing Technology

**Module 2**

**Introduction to 3D Modelling**

- Materials for 3D Printing
- 3D Part Design & Assembly
- Motion Animation

**Module 3**

**Familiarization of Onshape Software**

- Development of Engineering Drawing
- Surface Modelling

**Module 4**

**Design Project**

**Program Schedule**

| Date | Session | Topic | Resource person |
|---|---|---|---|
| 23.11.21 | 9:00 am-12:00 pm | Introduction to 3D Modelling | Mr. Nikhil Asok N( Asst. Professor, Dept. of ME) |
| | 12.30 pm-3:30 pm | Introduction to 3D printing and Onshape Software | Dr. Parvathy M ( Assoc. Professor, Dept. of ECE) |
| 24.11.21 | 9:00 am-12:00 pm | 3D Part Design | Mr. Nikhil Ashok ( Asst. Professor, Dept. of ME) |
| | 12.30 pm-3:30 pm | 3D Part Design | Mr. Vinoj P G (Asst. Professor, Dept. of ECE) |

| | | | |
|---|---|---|---|
| 25.11.21 | 9:00 am-12:00 pm | Assembling Techniques | Mr. Nikhil Asok N ( Asst. Professor, Dept. of ME) |
| | 12.30 pm-3:30 pm | Motion Animation | Mr. Nikhil Asok N ( Asst. Professor, Dept. of ME) |
| 26.11.21 | 9:00 am-12:00 pm | Development of Engineering Drawing | Mr. Nikhil Asok N ( Asst. Professor, Dept. of ME) |
| | 12.30 pm-3:30 pm | Surface Modelling, Demonstration of working of 3D Printerat Fab Lab | Mr. Vinoj P G (Asst. Professor, Dept. of ECE) & Ms. Smitha P C ( Lab Instructor, Fab Lab) |
| 27.11.21 | 9:00 am-12:00 pm | 3D Printing Projects | Mr. Nikhil Asok N ( Asst. Professor, Dept. of ME) & Mr.R Premanand ( Lab- Instructor, CAD Lab) |
| | 12.30 pm-3:30 pm | | |

Dr. Parvathy M
Course Coordinator

Ms. Anandhi V
HOD

Dr.Praveensal C J
Principal

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**ADD ON COURSE**

**ON**

# Arduino Programming Using MATLAB/Simulink

CONDUCTED BY

## DEPARTMENT OF ELECTRICAL ENGINEERING

Forenoon session: 9:00 am-12:00pm (3 hours)

Afternoon session: 12:30 pm - 3:30 pm (3 hours)

Total: 30 hours (6 hours per day)

**Course Date:**

4/10/2021-8/10/2021

# Arduino Programming Using MATLAB/Simulink

Course duration: 30 hours

Course Coordinator: Ms. Deepa.S

## Course Description

Arduino IDE is a special software running on your system that allows you to write sketches for different Arduino boards. The Arduino programming language is based on a very simple hardware programming language called processing, which is similar to the C language

## Course Objectives

- Learn programming in matlab
- Learn programming in Simulink
- Learn how to convert matlab programs into Arduino program
- Learn how to convert Simulink programs into Arduino programs

## Course Outcomes

After completing the course, students will be able to:

- Convert matlab programs into Arduino programs
- Convert Simulink programs into Arduino programs
- Develop any control system using Arduino processors

**Assessment Pattern**

Two assignments of 15 marks each

Final Assessment exam -50 marks, passed with a minimum of 20 marks
Viva-20 marks

Certificates will be awarded to students who completed the course with a minimum of 40 marks (total score) and a minimum of 20 marks in final exam. Minimum 75% attendance is mandatory to get the certificate.

**Module 1 (6 hours)**

**Introduction to MATLAB :** MATLAB programming environment, basic matlab functions, control loops, example programs

*Module 2 (6 hours)*

**Introduction to SIMULINK :** Simulink programming environment, basic building blocks, introduction to toolboxes, control system toolbox, rea time programming environment, setting parameters

*Module 3(6 hours)*

**Introduction to Arduino :** Different Arduino boards, capabilities and limitations, analog input, analog output, digital input, digital output, PWM output, simple programs

*Module 4 (6 hours)*

**Arduino programming using matlab :** Converting matlab programs into Arduino programs, analog input, analog ourput, digital input, digital output. Simple programs , LED blinking, nonstable and astable multivibrators

*Module 5 (6 hours)*

**Arduino Programming using SIMULINK :Installing** Arduino support package for Simulink, analog input, analog output, digital input, digital output, PWM output, control blocks, example programs using LED, speed control of small motors.

Coordinator

HOD

Principal

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**ADD ON COURSE**

**ON**

# CYBERSECURITY ESSENTIALS

CONDUCTED BY

## Department of Computer Science and Engineering

Course Date: 09th September 2021 to 12th September and 18th 2021

Forenoon session: 9:00 am-12:00pm (3 hours)
Afternoon session: 1:00 pm - 4:00 pm (3 hours)
Total: 30 hours (6 hours per day)

# CYBERSECURITY ESSENTIALS

Course duration: 30 hours

Course Coordinator: Ms.Sindhya K Nambiar

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## Course Objectives

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- ☐ To identify and analyze various cybersecurity threats
- ☐ To develop deeper understanding of cybersecurity technologies
- ☐ To develop skills on ethical hacking

## Course Outcomes

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After completing the course, students will be able to:

- ☐ Students will possess a deep and comprehensive understanding of various cyber threats
- ☐ Students will be proficient in implementing cybersecurity measures
- ☐ Students will develop strong incident response capabilities for mitigating security incidents

**Assessment Pattern**

Two assignments of 15 marks each

Final Assessment exam -50 marks, passed with a minimum of 20 marks
Viva-20 marks

Certificates will be awarded to students who completed the course with a minimum of 40 marks (total score) and a minimum of 20 marks in final exam. Minimum 75% attendance is mandatory to get the certificate.

## Syllabus

### Module 1 (6 hrs)

Structure in C

### Module 2 (6 hrs)

Union in C Language

### Module 3 (6 hrs)

File Input/Output

### Module 4 (6 hrs)

Dynamic Memory Allocation

### Module 5 (6 hrs)

C Pre-processor

Command Line Arguments

Course Coordinator

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**ADD ON COURSE**

**ON**

# Microsoft AI

CONDUCTED BY

## Department of Computer Science and Engineering

Forenoon session: 9:00 am-12:00pm (3 hours)

Afternoon session: 12:30 pm - 3:30 pm (3 hours)

Total: 30 hours (6 hours per day)

**Course Date: 14/12/2021-18/12/2021**

# Microsoft AI

Course duration: 30 hours

**Course Coordinator:** Ms. Susmi Jacob

**Course Description**

A Course on Microsoft AI was organized by HackElite-Technical Club (Department of Computer Science and Engineering).

**Course Objectives**

- The goal is to acquire knowledge on intelligent systems and agents, formalization of knowledge, reasoning with and without uncertainty, machine learning and applications.
- The basic skill that the student is expected to acquire after the successful completion of the course is knowledge and application of basic principles and techniques of intelligent systems and their practical applications.

**Course Outcomes**

After completing the course, students will be able to:

- Understanding of the historical evolution of Artificial Intelligence
- Identification of the characteristics of an intelligent system/agent
- Formalize knowledge using probability
- Within each of the learning paradigms, identify and implement appropriate learning strategies.
- Formalize and design solutions to practical problems of current interest using the strategies introduced during the course

**Assessment Pattern**

Two assignments of 15 marks each

Final Assessment exam -50 marks, passed with a minimum of 20 marks
Viva-20 marks

Certificates will be awarded to students who completed the course with a minimum of 40 marks (total score) and a minimum of 20 marks in final exam. Minimum 75% attendance is mandatory to get the certificate.

## Syllabus

**Module 1**

- Python for AI & ML
- Applied Statistics

**Module 2**

- Supervised Learning
- Unsupervised Learning
- Ensemble Techniques
- Featurization, Model Selection & Tuning
- Recommendation Systems

**Module 3**

- Introduction to Neural Networks and Deep Learning
- **Computer Vision**
- Natural Language Processing

**Module 4**

- EDA
- Time Series Forecasting
- Pre Work for Deep Learning
- Model Deployment

**Module 5**

- Visualization using Tensor board
- GANs (Generative Adversarial Networks)
- Reinforcement Learning

susmi

Course Coordinator

HOD

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**ADD ON COURSE**

**ON**

# *Ansys and Creo*

CONDUCTED BY

## DEPARTMENT OF AUTOMOBILE ENGINEERING

Forenoon session: 9:00 am-12:00pm (3 hours)

Afternoon session: 12:30 pm - 3:30 pm (3 hours)

Total: 30 hours (6 hours per day)

Course Date:

4/11/2021-8/11/2021

# Add on course on Ansys and Creo

Course duration: 30 hours

Course Coordinator: Mr. Amal P Dev

## Course Description

This course is to give a basic knowledge and understanding about computer aided designing and analysis to be done before finalizing a design. This course will be helpful for students to acquire basic knowledge about Creo and ANSYS.

## Course Objectives

- To provide working knowledge on CAD
- To train a solid modeling and assembly modeling software
- To train finite element analysis software

## Course Outcomes

After completing the course, students will be able to:

- Gain working knowledge in CAD
- Gain Knowledge in doing simple structural analysis problems

**Assessment Pattern**

Two assignments of 15 marks each

Final Assessment exam -50 marks, passed with a minimum of 20 marks
Viva-20 marks

Certificates will be awarded to students who completed the course with a minimum of 40 marks (total score) and a minimum of 20 marks in final exam. Minimum 75% attendance is mandatory to get the certificate.

## Syllabus

**Module 1**

Introduction to CAD basics

**Module 2**

2D Sketch Drawing

**Module 3**

3D part Drawing

**Module 4**

Assembly Drawing

Course Coordinator

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# Value added course on

# Personality Development for Engineers

CONDUCTED BY

**BASIC SCIENCES AND HUMANITIES DEPARTMENT AND PLACEMENT CELL**

**SCMS SCHOOL OF ENGINEERING AND TECHNOLOGY**

**VIDYA NAGAR, KARUKUTTY, KERALA - 683576**

**Forenoon session: 9:00 am-12:00pm (3 hours)**
**Afternoon session: 12:30 pm - 3:30 pm (3 hours)**
**Total: 30 hours (6 hours per day)**

**Course Date:**

**1/6/21,10/9/21, 15/9/21, 17/9/21 and 22/9/21**

# Personality Development for Engineers

## Course Objectives

- To train the students to meet the expectations of the industry
- To build confidence in students and develop right attitude in them
- To enhance their communication skills

## Course Outcomes

After completing the course, students will be able to

- Develop strong communication skills
- Develop confidence in facing different situations in job place
- Understand the requirements of the industry

## Syllabus

**Module 1 – 6 hours**

Career planning- Career mapping

**Module 2 – 6 hours**

Requirements of industry – Tackling of aptitude exams

**Module 3 – 6 hours**

Quantitative Aptitude - Logical Reasoning -Verbal reasoning

**Module 4 – 6 hours**

Personality development – Group discussion techniques

**Module 5 – 6 hours**

Speaking skills – Confidence building techniques – Mock Interviews

**Assessment Pattern**

Two assignments of 15 marks each

Final Assessment exam -50 marks, passed with a minimum of 20 marks
Viva-20 marks

Certificates will be awarded to students who completed the course with a minimum of 40 marks (total score) and a minimum of 20 marks in final exam. Minimum 75% attendance is mandatory to get the certificate.

# Course summary


Screenshot of the value added course on Personality development for Engineers

The value added course was organized by Basic Sciences and Humanities department and Placement cell on 1/6/21, 10/9/21, 15/9/21, 17/9/21 and 22/9/21 and 183 of students successfully completed the course

Course Coordinator

HOD

Principal

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**ADD ON COURSE**

**ON**

# INTERNET OF THINGS

CONDUCTED BY

## Department of Computer Science and Engineering

Forenoon session: 9:00 am-12:00pm (3 hours)

Afternoon session: 12:30 pm - 3:30 pm (3 hours)

Total: 30 hours (6 hours per day)

Course Date:

18/10/2021-22/10/21

# ADD ON COURSE ON INTERNET OF THINGS (30 HOURS)

Course Duration: 30 hours

Course Coordinator: Ms. Sindhya K Nambiar

## Course Description

A five day add on course was organised for CS students by  of Department of Computer Science and Engineering from 18/10/2021 to 22/10/2021 in online mode.

## Course Objectives

- To learn why IOT is useful for the design of desktop and web applications.
- TTo design and program stand-alone IOT applications.

## Course Outcomes

After completing the course, students will be able to:

- Use an integrated development environment to write, compile, run, and test simple object-oriented  programs.
- Read and make elementary modifications to IOT programs that solve real-world problems.

**Assessment Pattern**

Two assignments of 15 marks each

Final Assessment exam -50 marks, passed with a minimum of 20 marks
Viva-20 marks

Certificates will be awarded to students who completed the course with a minimum of 40 marks (total score) and a minimum of 20 marks in final exam. Minimum 75% attendance is mandatory to get the certificate.

# Syllabus

**Module 1 (6 hrs)**
Introduction to IOT - History of IOT-Requirements and structure of IOT

**Module 2 (6 hrs)**
IOT enabling technologies- IOT architecture- Type Compatibility andConversion Implementing interfaces.

**Module 3 (6 hrs)**
IOT components- IOT networking protocols

**Module 4 (6 hrs)**
IOT services and applications-standards

**Module 5 (6 hrs)**

IOT Case studies

Course Coordinator HOD Principal

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Department of Mechanical Engineering organises

## ADD-ON COURSE

# CNC LATHE SMARTTURN

**11 Apr 2022 - 23 Apr 2022 (30 Hours)**

FN: 8.45 -11.45 am(3hrs), AN: 12.30 -3.30 pm(3hrs)

Machine working, Safety precautions
Hardware and Software details
Control panel, control systems, power supply
Part programming and programming simulation
Machine operation
Program loading, simulation, program verification
Automated program execution


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Website: www.scmsgroup.org/sset Tel: 0484 2882900/0484 2450330


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# SCMS SCHOOL OF ENGINEERING AND TECHNOLOGY

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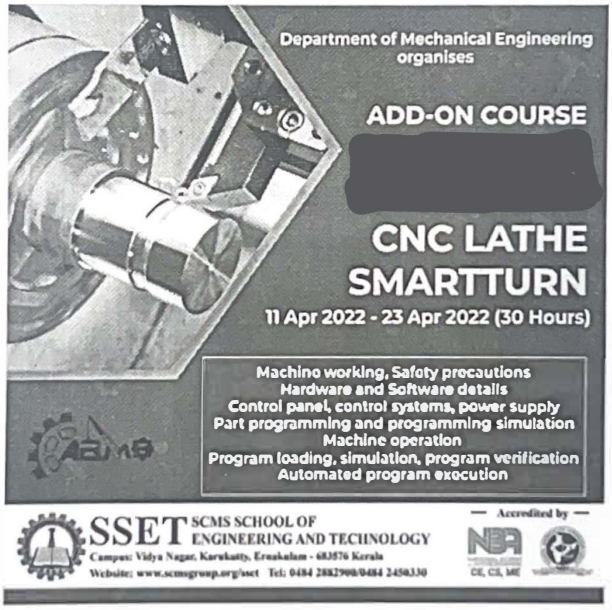
## DEPARTMENT OF MECHANICAL ENGINEERING

## ASSOCIATION OF MECHANICAL ENGINEERS FOR RESEARCH AND INNOVATION (ARiME)

**ADD-ON COURSE – CNC Lathe Smartturn**

The Department of Mechanical Engineering, SCMS School of Engineering and Technology conducted a five-day (30 hours) add-on course session on " CNC Lathe Smartturn" for the students of third year Mechanical Engineering (2019-23 batch) in the month of April 2022.




**Objective and outcomes of the course –**

Computer Numerical Control (CNC) machining is a manufacturing process in which pre-programmed computer software controls the movement of tools during a cutting operation. CNC machines are vastly used for grinding, milling, turning and many more other machining operations. SSET is equipped with a CNC Lathe Smartturn machine at the Manufacturing Technology Lab.

This course aimed at offering hands-on experience and impart practical knowledge on CNC lathe thereby providing them with the skills and knowledge required to operate and maintain a CNC lathe machine. The outcomes of the course can be summarized as below.

- To enable the students to differentiate the conventional machine operations with the CNC machine.
- To introduce students to the basics of CNC technology, including the principles of operation, the components of the system, and the programming language.
- To develop students understanding of the different cutting tools, work holding devices, and materials used in CNC lathe machining.
- To teach students how to create and edit CNC programs using industry-standard software.
- To teach students the importance of safety in CNC lathe machining and the procedures for handling hazardous materials.

The course was identified to fill the gap in syllabus for the course "MET307 Machine Tools and Metrology" during the 5th semester of the B.Tech program. In addition to familiarization with the working and programming of CNC lathe, the students will be able to differentiate the construction, accuracy and precision of the machining process, quality of the machined products, and overall productivity of the CNC machines compared to conventional machine tools.

**Course contents and Schedule –**

The five-day course was scheduled as follows:

| Date and Day | Session | Topic |
|---|---|---|
| 11 April 2022 Monday | Forenoon | Introduction to machine working, Safety precautions |
| | Afternoon | Basics of machine working |
| 12 April 2022 Tuesday | Forenoon | Hardware details |
| | Afternoon | Software details |
| 13 April 2022 Wednesday | Forenoon | Familiarization of control panel, control systems, power supply |
| | Afternoon | Part programming and programming simulation |
| 16 April 2022 Saturday | Forenoon | Machine operation |
| | Afternoon | Program loading, simulation, program verification |
| 23 April 2022 Saturday | Forenoon | Automated program execution |
| | Afternoon | Automated program execution and assessment test |

After completion of the course participants were well versed in developing CNC lathe programs and executing them for simple as well as complex machining operations. A student's feedback was taken on the training program at the end of the last day, the sample is attached separately. The feedback on the workshop was taken from a total of 20 students. The course aided in the achievement of various programme outcomes, the summary of which is given in the table below. The weightage level of PO is based on the following criteria:

- Level 3 - Percentage of students agreed is greater than 90%
- Level 2 - Percentage of students agreed is greater than 80%
- Level 1 - Percentage of students agreed is greater than 70%

| Question no. | Number of students agreed | Percentage of students agreed | Relevance to PO | PO level |
|---|---|---|---|---|
| 1 | 20 | 100 | - | - |
| 2 | 20 | 100 | - | - |
| 3 | 20 | 100 | - | - |
| 4 | 18 | 90 | 5 | 3 |
| 5 | 19 | 95 | 10 | 3 |
| 6 | 16 | 80 | 12 | 2 |
| 7 | 15 | 75 | 9 | 1.5 |
| 8 | 15 | 75 | 6,7 | 1.5 |
| 9 | 17 | 85 | 11 | 2.5 |
| 10 | 16 | 80 | 1,2,3 | 2 |

Common comments/suggestions made by students are summarized below.

- Helpful session as it involved more of industrial applications.
- Looking forward for more hands-on sessions.
- Needed more and advanced practical sessions to machine complicated profiles.
- If possible, provide company certification for such sessions.

Overall PO attainment of the workshop is given in the below table.

| PO | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Attainment | 2 | 2 | 2 | - | 3 | 1.5 | 1.5 | - | 1.5 | 3 | 2.5 | 2 |

**Timings –**

Forenoon session – 08:45 am – 11:45 am (3 hours)

Afternoon session – 12:30 pm – 03:30 pm (3 hours)

Total – 30 hours (6 hours per day)

**Venue** – Manufacturing Technology Lab, ACI 01 classroom

**Contents covered (an overview) –**

**Day 1 (FN session) - Introduction to machine working, Safety precautions** – General instructions, Comparison of CNC and conventional lathe, Parts of CNC lathe, Machine working

**Day 1 (AN session) - Basics of machine working** – Drive units – AC and DC types, Transmission belting, Axes feed drives, Servomoter

**Day 2 (FN session) - Hardware details** – Chuck, Turrent, Slideways, Tail center, Cutting tools, Coolant supply

**Day 2 (AN session) - Software details** – Control panel, Switches, Programming codes

**Day 3 (FN session) - Familiarization of control panel, control systems, power supply** – Control panels, Control drives, Servomotor, Feedback drives

**Day 3 (AN session) - Part programming and programming simulation** – G-codes and M-codes

**Day 4 (FN session) - Machine operation** – Home position, tool offset, work offset, chuck open/close, tail center movement, turret position

**Day 4 (AN session) - Program loading, simulation, program verification** – Turning, Facing, Step turning with cycles, Grooving, Taper turning, Threading, Drilling

**Day 5 (FN session) - Automated program execution** – Machining and line-by-line verification

**Day 6 (FN session) - Automated program execution and assessment** – An assessment test was given to students to write down the part program of a simple component manufactured by CNC lathe. The question and part program are attached with the report.

The sessions were handled by the faculty members of Mechanical Engineering, the details of which are provided in the attendance sheet attached. Theory sessions were conducted for the entire students as a whole whereas practical sessions were conducted in groups of 10. Minimum criteria for certification were 80% attendance, i.e. 24 hours and 60% marks in the assessment test conducted at the end of the course. 45 students out of 56 (80.4%) completed the course successfully and e-certificates were handled over.


Students attending the Add course on CNC Lathe (30 hours) held from 11-23 April 2022

**Faculty coordinator** Anup Kumar

**Dr. Rag R. L**
**HOD, MED**


**SCMS SCHOOL OF ENGINEERING AND TECHNOLOGY**

**VIDYA NAGAR, KARUKUTTY, KERALA - 683576**

**ADD ON COURSE**

**ON**

# Essential Concepts in C Programming

CONDUCTED BY

Department of Computer Science and Engineering

Forenoon session: 9:00 am-12:00pm (3 hours)
Afternoon session: 1:00 pm - 4:00 pm (3 hours)
Total: 30 hours (6 hours per day)

Course Dates:

22/6/2021,23/6/2021,24/6/2021,25/6/2021,26/6/21

# Essential Concepts in C Programming

Course duration: 30 hours

Course Coordinator: Rosebell Paul

## Course Description

A Course on essential concepts in C programming language was organized by HackElite-Technical Club (Department of Computer Science and Engineering).

## Course Objectives

- To understand the fundamental concepts of the C programming language.
- To create and use functions to organize code effectively
- To implement decision-making constructs and loops.

## Course Outcomes

After completing the course, students will be able to:

- Declare, initialize, and manipulate variables in C
- Create C programs that demonstrate control flow
- Debug and troubleshoot C code effectively.

**Assessment Pattern**

Two assignments of 15 marks each

Final Assessment exam -50 marks, passed with a minimum of 20 marks
Viva-20 marks

Certificates will be awarded to students who completed the course with a minimum of 40 marks (total score) and a minimum of 20 marks in final exam. Minimum 75% attendance is mandatory to get the certificate.

# Syllabus

## Module 1 (6 hrs)

Variable in C Language

## Module 2 (6 hrs)

Operators and Enums in C Language

## Module 3 (6 hrs)

Decision Making of C Language

## Module 4 (6 hrs)

Loop control in C Language

## Module 5(6 hrs)

Control Flow in C Programming

Coordinator

HOD

Principal

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# GEOSYNTHETICS AND REINFORCED SOIL STRUCTURES

**PROF. K. RAJAGOPAL**

Department of Civil Engineering

Andhra University

**INTENDED AUDIENCE :** Two basic courses in geotechnical engineering at UG level that covers fundamentals of soil mechanics and designs of retaining walls, slope stability analysis and foundations is the required background for this course.

**COURSE OUTLINE :**

This course will dealt with the geosynthetics as construction materials in civil engineering projects. It will introduce the concept of geosynthetics, their manufacture and their behavior and their applications in different civil engineering designs. The support for the course will be in the form of pre-recorded videos, power point slides and supplementary reading materials given every week.

**ABOUT INSTRUCTOR :**

Prof. K. Rajagopal joined as an Adjunct Professor at Andhra University, Visakhapatnam after retirement from the services of IIT Madras (Department of Civil Engineering). He has more than 25 years of experience with teaching and research in geosynthetics and reinforced soil structures.

**COURSE PLAN :**

**Week 1:** Introduction to Geosynthetics

Types of geosynthetics and their applications

Manufacture of geosynthetics

**Week 2:** Strength of reinforced soils

Testing of Geosynthetics

**Week 3:** Different Types of Soil Retaining Structures

Construction Aspects of Geosynthetic Reinforced Soil Retaining Walls

Design Codes for Reinforced Soil Retaining Walls

**Week 4:** External Stability Analysis of Reinforced Soil Retaining Walls

Seismic Loads and Internal Stability Analysis of Reinforced Soil Walls

Testing Requirements for Reinforced Soil Retaining Walls

**Week 5:** Design of Reinforced soil Retaining walls - simple geometry

Design of reinforced soil retaining walls – sloped backfill soil

Design of reinforced soil retaining walls supporting a bridge abutment

**Week 6:** Stability analysis of soil slopes- Infinite slopes

Stability analysis of reinforced soil slopes resting on soft foundation soils

Stability analysis of reinforced soil slopes resting on strong foundation soil

**Week 7:** Stability analysis of reinforced soil slopes - bilinear wedge analysis

Design of Embankments supported on Load Transfer Platforms

**Week 8:** Reinforced soil for supporting shallow foundations

**Week 9:** Accelerated consolidation of soft clays using geosynthetics

Geosynthetic encased stone columns for load support

**Week 10:** Drainage application of geosynthetics

Filtration Applications of Geosynthetics

**Week 11:** Erosion control using geosynthetics

Natural geosynthetics and their applications

**Week 12:** Geosynthetics for construction of municipal and hazardous waste landfills


# GLASS IN BUILDINGS : DESIGN AND APPLICATIONS

**PROF. K.N. SATYANARAYANA**
Department of Civil Engineering
IITM & Glass Academy

**PROF. E. RAJASEKAR**
Department of Civil Engineering
IITM & Glass Academy

**TYPE OF COURSE** : Rerun | Elective | UG
**COURSE DURATION** : 12 weeks (26 Jul'21 - 15 Oct'21)
**INTENDED AUDIENCE** : Any Interested Audience
**EXAM DATE** : 23 Oct 2021
**PRE-REQUISITES** : Elective for third Year Civil Engineering and fourth year Architecture students.
**INDUSTRIES APPLICABLE TO** : Structural Glass Industry/ Building Façade Industry

## COURSE OUTLINE :

The field of Building Envelope Design & Construction has become a specialized field with several codes emphasizing energy efficiency to buildings both on mandatory and voluntary basis. Glass is one of the energy efficient materials that lend aesthetic and functional value to a building. Glass being extensively used in buildings, whereas the fields aligning including the right selection, analysis, design including facade design and consulting is tremendously facing lack of knowledge and competent professionals across the country.This course on 'Glass in Buildings: Design and Applications' will holistically cover the critical aspects of glass facade engineering and glass architecture & design

## ABOUT INSTRUCTOR :

Prof. K N Satyanarayana, Civil Engineering,IIT Tirupathi

Dr. E. Rajasekar is an assistant professor at the Department of Architecture and Planning ,IIT Roorkee, India. He is an Architect with post-graduation in Building Technology and Construction Management and PhD on Thermal comfort and building performance from IIT Madras. He is a Shastri Indo - Canadian Institute Doctoral Fellow.He specializes in the field of building performance assessment focused on the thermal,acoustics and lighting parameters.He carries a rich research and industry experience in this field and has published more than 20 technical papers in peer-reviewed journals and conferences. He is a USGBC LEED accredited professional and a GRIHA certified professional.

**COURSE PLAN :**

**Week 01** : Introduction – Glass the Building Material
**Week 02** : Float Glass Manufacturing Process
**Week 03** : Building Envelope Design
**Week 04** : Glass Application on Facades and future of facades
**Week 05** : Architectural Glass – The Basics
**Week 06** : Fire Resistant Glazing
**Week 07** : Acoustic Glass Solutions
**Week 08** : Interior Glazing Applications
**Week 09** : Introduction to National Building Code (NBC) 2016
**Week 10** : Case Study – Design and selection of Glass and Glazing system – Safety and Structural Performance
**Week 11** : Design and selection criteria for energy performance of Glass and Glazing system
**Week 12** : Design and application of sealant

# MODERN CONSTRUCTION MATERIALS

**PROF. RAVINDRA GETTU**
Department of Civil Engineering
IIT Madras

**PRE-REQUISITES :** Knowledge of civil engineering or architecture

**INTENDED AUDIENCE :** Core for post-graduates, Post-graduate and upper level undergraduate, BE/BTech/ME/MTech/BArch/MArch/MS/MPhil/Ph.D

**INDUSTRIES APPLICABLE TO :** Companies in the construction sector.

**COURSE OUTLINE :**
The aim of the course is to provide the scientific basis for the understanding and development of construction materials. It serves as a foundation course for post-graduate students interested in careers involving research, teaching and/or construction engineering, as well as marketing, decision making, innovation and specification related to construction materials. It can also be a capstone course for undergraduates finishing their studies in civil engineering and architecture.

**ABOUT INSTRUCTOR :**
Prof. Ravindra Gettu is a chair professor of civil engineering at IIT Madras. He has coordinated the introductory course at IITM and given lectures at other institutes on civil engineering for more than 10 years. He has a wide range of experience in research, education and consultancy. His specific area of expertise is construction materials.

**COURSE PLAN :**

**Week** 1**:** Prologue – Intro. to the course, Science,Engineering and Technology of Materials- 1&2, Atomic Bonding-1

**Week** 2**:** Atomic Bonding-2, Structure of Solids-1, Structure of Solids-2&3

**Week** 3**:** Movement of Atoms, Development of Microstructure-1,Development of Microstructure-2

**Week** 4**:** Surface Properties, Response to Stress-1, Response to Stress-2&3

**Week** 5**:** Failure Theories, Fracture Mechanics-1, Fracture Mechanics-2

**Week** 6**:** Rheology & Thermal properties, Review of Const. Materials & Criteria for Selection, Wood and Wood Products-1

**Week** 7**:** Wood and Wood Products-2, Wood and Wood Products-3, Polymers

**Week** 8**:** Fibre Reinforced Polymers-1&2, Metals-1, Metals-2

**Week** 9**:** Metals-3, Bituminous Materials-1, Bituminous Materials-2

**Week** 10**:** Concrete-1, Concrete-2, Concrete-3

**Week** 11**:** Concrete-4, Concrete-5, Glass - Guest Lecture

**Week** 12**:** Waterproofing Materials, Polymer Floor Finishes, Anchors

# REMOTE SENSING: PRINCIPLES AND APPLICATIONS

**PROF. ESWAR RAJASEKARAN**
Department of Civil Engineering IIT Bombay

**TYPE OF COURSE** : Rerun | Elective | UG/PG
**COURSE DURATION** : 12 Weeks (24 Jan' 22 - 15 Apr' 22)
**EXAM DATE** : 24 Apr 2022

**INTENDED AUDIENCE :** Civil Engineering, Earth Science, Agriculture, Geoinformatics

**COURSE OUTLINE :**

Remote sensing (RS) is the technology that helps to gather information about objects and phenomena from a distance. There has been a radical transformation in the technology from the early application of 'image interpretation' to the paradigm of quantitative RS. The advancement in sensors and data processing algorithms have led to multiple applications of RS in various domains. To perform quantitative RS, one must understand the basic nature of RS sensors, the interaction between electromagnetic radiation and earth surface features and the assumptions and limitations of the algorithms applied. This course will enable the participants to learn about the necessary physical concepts involved in different phases of RS which will help in better appreciation of algorithms and existing datasets. The concepts will further be strengthened through explanation of selected applications.

**ABOUT INSTRUCTOR :**

Prof. Eswar is currently working as Assistant Professor in the Department of Civil Engineering, IIT Bombay. Previously he was working as Postdoctoral fellow in the NASA Jet Propulsion Laboratory, Pasadena, California from 2016-2018. Dr. Eswar completed his Bachelors in Geoinformatics from College of Engineering Guindy, Anna University, Chennai with University Gold Medal and Ph.D. from IISc, Bangalore. His primary research interests are thermal infrared remote sensing (TIR RS), mapping evapotranspiration and flux partitioning from RS, drought monitoring from RS datasets, spatial disaggregation of TIR data, applications of TIR RS in areas such as agriculture, water and urban studies.

**COURSE PLAN :**

**Week** 1**:** Introduction, electromagnetic radiation, basic laws

**Week** 2**:** Radiometry, Interaction of EMR with terrain features

**Week** 3**:** RS in visible and IR domain: Radiance to reflectance, atmospheric and topographic correction

**Week** 4**:** RS image acquisition, Different types of sensors, resolution concepts

**Week** 5**:** Resolution concepts, Spectral reflectance curves

**Week** 6**:** Spectral reflectance curves, Spectral indices

**Week** 7**:** Thermal infrared remote sensing

**Week** 8**:** Passive microwave radiometry

**Week** 9**:** Active microwave remote sensing: Imaging radar

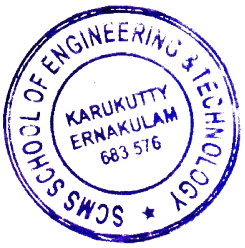
**Week** 10**:** Platforms used for RS data acquisition and characteristics

**Week** 11**:** LIDAR, Common remote sensing datasets and data portals

**Week** 12**:** Applications of RS for land use and land cover monitoring, water resources management

**Assessment Pattern for certificate courses**

A learner will pass and be certified only if Average assignment score (out of 100) >= 40 AND Final exam score (out of 100) >= 40.

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