



S. B. JAIN INSTITUTE OF TECHNOLOGY, MANAGEMENT & RESEARCH, NAGPUR.

(An Autonomous Institute, Affiliated to RTMNU, Nagpur)



DEPARTMENT OF ELECTRICAL ENGINEERING

Vision: Transform knowledge seekers to globally competent professionals in Electrical Engineering

Report Activity (Session 2020-21)

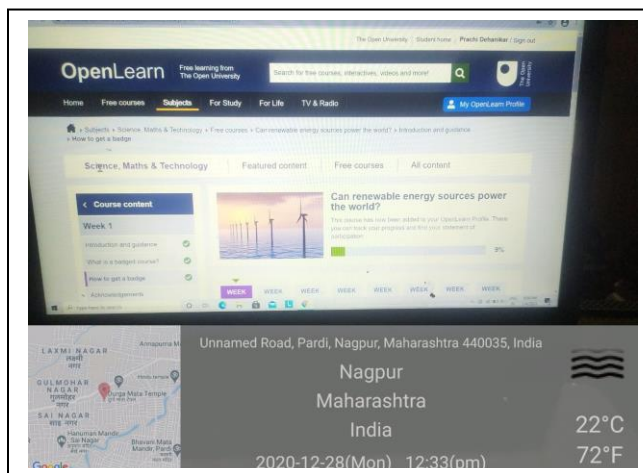
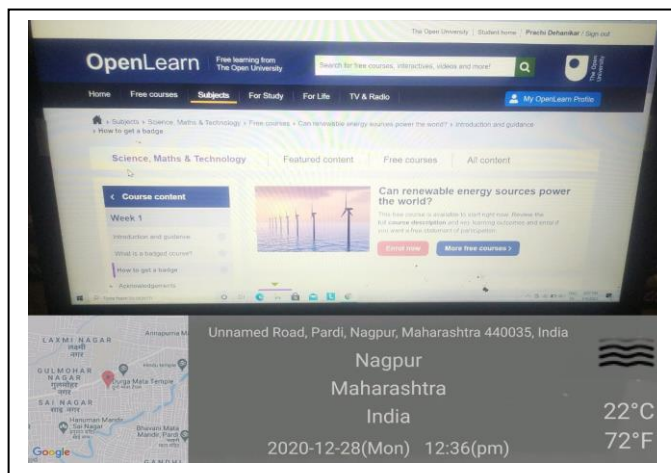
Name of the activity:-	Certification course: “CAN RENEWABLE ENERGY SOURCES POWER THE WORLD” for 2 nd year/ 3 rd semester students
Date of activity:-	28-12-2020 to 02-01-2021
Name of Internal Co-ordinator:-	Mr. A A Khan
Mode of Activity:-	Online (Through Open Learn Platform)
Total no. of participants:-	36

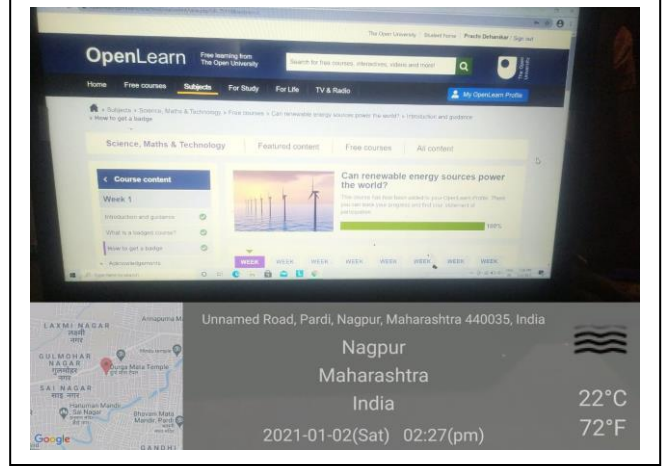
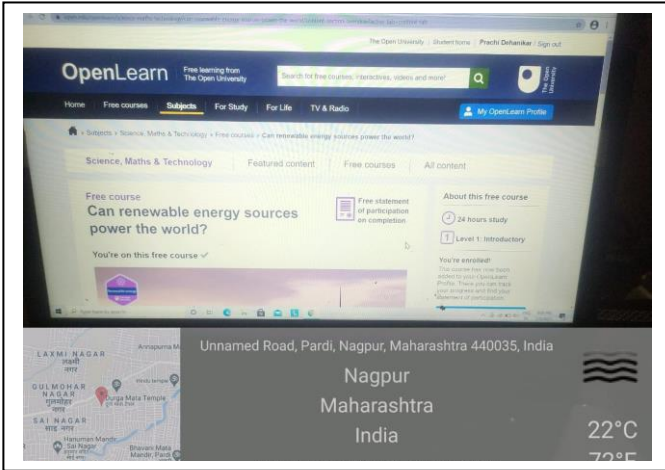
Activity Details :-

Electrical Engineering Department conducted the online certification course titled “CAN RENEWABLE ENERGY SOURCES POWER THE WORLD” for 2nd year/ 3rd semester students during 28-12-2020 to 02-01-2021. The objectives of this course is-

- 1) To aware about the essential characteristics of energy demand and supply in the world
- 2) To provide knowledge of aware of the principal renewable energy technologies and their main characteristics
- 3) To develop the understanding of some of the factors that are working to promote the deployment of renewable energies and those acting to inhibit it.

Photographs:-





Details of data recorded:-

Sr. No.	Details of document record	Record present	Remark
1	Circular /Notices Made	Yes	Notice is present.
2	Completion Certificate	Yes	Sot copy of students certificates are available and sample copies has been attached.
3	Photographs	Yes	All related photographs are collected.

Dr. Pankaj B. Thote
HOD, EE



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DEPARTMENT OF ELECTRICAL ENGINEERING

Vision: Transform knowledge seekers to globally competent professionals in Electrical Engineering

CAN RENEWABLE ENERGY SOURCES POWER THE WORLD?

Course Code: EE301

Session 2020-21
Second year (3rd Sem)

Certification Course

<u>Sr. No.</u>	<u>TOPIC</u>	<u>Date</u>	<u>Time</u>
	I. INTRODUCING RENEWABLE ENERGY		
1.	<ol style="list-style-type: none">1. Defining sustainable and renewable energy.<ol style="list-style-type: none">1.1 Renewed interest in renewables.2. Energy definitions and concepts.3. Renewable energy from the Sun.4. Energy supply and demand: world and UK.5. Fossil fuels, greenhouse gases and climate change.	26/12/2020	10:30 am to 1:30 pm
	<ol style="list-style-type: none">6. Overview of renewable energy sources.7. EU and UK renewable energy prospects 2020-2030.8. Case study: Scotland aims for 100% renewable electricity by.9. Quiz-1.10. Summary		
	II. SOLAR ENERGY FOR HEATING AND DAYLIGHTING		
2.	<ol style="list-style-type: none">1. Solar thermal energy and daylighting.2. Direct and diffuse solar radiation.3. Passive solar heating of buildings.4. Daylighting.5. Active solar heating.6. Varieties of solar collector.	26/12/2020	2:30 pm to 5:30 pm
	<ol style="list-style-type: none">7. Solar district heating.8. Heat pumps9. Solar thermal electricity generation.10. Quiz-2.11. Summary12. Practice quiz-1.		
3.	III. SOLAR PHOTOVOLTAICS		

	<ol style="list-style-type: none"> 1. Basic physical principles of photovoltaics. 2. Photovoltaic materials and technologies. 3. Photovoltaic systems for remote power. 4. PV systems for houses. 5. PV systems for non-domestic buildings. 6. Large PV power plants. 7. Energy yield from PV systems. 8. PV economics and environmental impact. 9. PV integration into electricity systems. 10. The growing world PV market. 11. Quiz-3. 12. Practice quiz-2. 	28/12/2020	10:30 am to 1:30 pm
<u>Sr. No.</u>	<u>TOPIC</u>	<u>Date</u>	<u>Time</u>
	IV. BIOENERGY		
4.	<ol style="list-style-type: none"> 1. Introducing bioenergy 2. Biomass as a solar energy store. 3. Biomass as a fuel. 4. Biomass energy from plants. 5. Secondary biomass energy from wastes, residues and co-products. 6. Biomass processing. 7. Environmental impact of bioenergy. 8. Energy balance of bioenergy. 9. Costing bioenergy. 10. Future prospects for bioenergy. 11. Quiz-4. 11. 12 Summary. 12. Compulsory badge quiz-1. 	28/12/2020	2:30 pm to 5:30 pm
	V. HYDROELECTRICITY		
5.	<ol style="list-style-type: none"> 1. Background to hydroelectricity. 2. Hydropower resources – world, regional, national. 3. World hydro output. 4. Small-scale hydro. 5. Stored energy and available power. 6. Types of hydroelectric plant. 7. Types of hydro turbine. 8. Hydro as a component of a power system. 9. Environmental impact of hydroelectricity. 10. Economics of hydroelectricity. 11. Future prospects for hydroelectricity. 12. Quiz-5. 13. Summary. 14. Practice quiz-3 	29/12/2020	10:30 am to 1:30 pm
	VI. WIND ENERGY		
6.	<ol style="list-style-type: none"> 1. The origins of wind and atmospheric pressure. 2. Energy and power in the wind. 3. Wind turbine types. 4. Aerodynamics of wind turbines. 5. Power and energy from wind turbines. 6. Environmental impact of wind energy. 	29/12/2020	2:30 pm to 5:30 pm

	<ul style="list-style-type: none"> 7. Calculating the costs of wind energy. 8. Offshore wind energy. 9. Future prospects for wind energy. 10. Quiz-6. 11. Summary. 12. Practice quiz-4 		
	VII. WAVE ENERGY		
7.	<ul style="list-style-type: none"> 1. The physical principles of wave energy. 2. Wave energy resources. 3. Wave energy technologies. 4. Wave energy economics. 5. Environmental impact of wave energy technology. 6. Grid integration of wave energy. 7. Conclusions. 8. Quiz-7. 9. Summary. 10. Practice quiz-5 	30/12/2020	10:30 am to 1:30 pm
	VIII. TOWARDS A RENEWABLE FUTURE		
8.	<ul style="list-style-type: none"> 1. UK renewable energy futures. 2. Balancing renewable supply and demand. 3. Pathways to 2050. 4. Renewable energy futures for Denmark. 5. Renewable energy futures for Germany. 6. Renewable energy scenarios for Europe. 7. European supergrids and DESERTEC. 8. Can renewables power the world?. 9. Summary and conclusions. 10. End of course quiz. 11. End of course summary. 12. Compulsory badge quiz-2 	30/12/2020	2:30 pm to 5:30 pm

Link for the course: <https://www.open.edu/openlearn/ocw/mod/oucontent/view.php?id=73765>



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DEPARTMENT OF ELECTRICAL ENGINEERING

Vision: Transform knowledge seekers to globally competent professionals in Electrical Engineering

Report Activity (Session 2020-21)

Name of the activity:-	Certification course: "ELEMENTARY ATTITUDES ABOUT ELECTRONIC APPLICATIONS" for 3 rd year/ 5 th semester students
Date of activity:-	28-12-2020 to 02-01-2021
Name of Internal Co-ordinator:-	Mr. Vishant G. Naik
Mode of Activity:-	Online (Through Open Learn Platform)
Total no. of participants:-	69

Activity Details :-

Electrical Engineering Department conducted the online certification course titled "ELEMENTARY ATTITUDES ABOUT ELECTRONIC APPLICATIONS" for 3rd year/ 5th semester students during 28-12-2020 to 02-01-2021. The objectives of this course is-

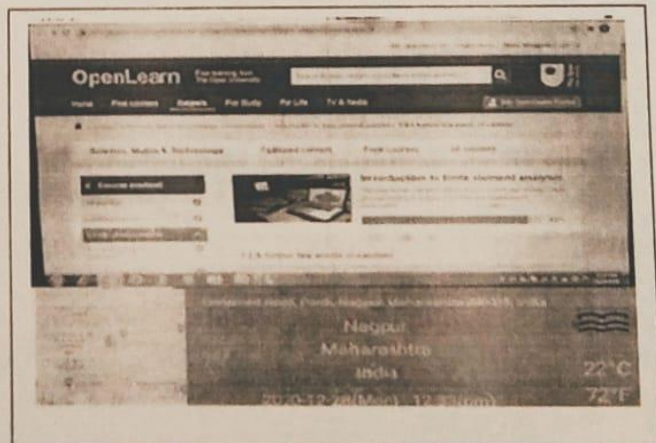
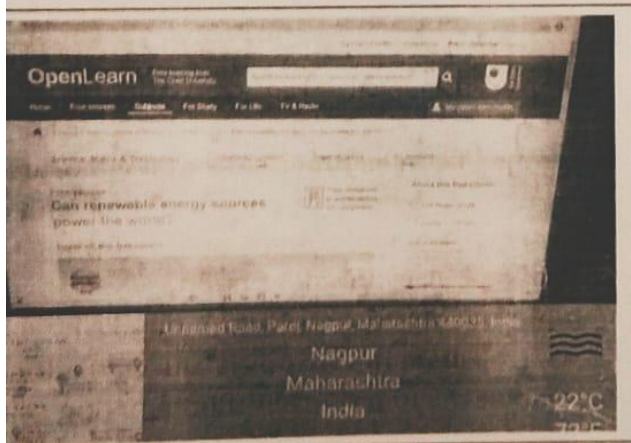
To understand the mathematical representations and techniques for manipulating of signals in time and frequency domains

To explain the application, benefits and limitations of communications, control and signal processing techniques in real world applications

To select and apply appropriate techniques to the analysis of time-varying signals represented in both the time and frequency domain

To apply digital filter to remove Gaussian noise from a signal.

Photographs:-



ails of data recorded:-

Details of document record	Record present	Remark
Circular /Notices Made	Yes	Notice is present.
Completion Certificate	Yes	Soft copy of students certificates are available and sample copies has been attached.
Photographs	Yes	All related photographs are collected.



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Report Activity

(Session 2020-21)

Name of the activity:-

Certification course: “Strategic Planning: Systems Thinking In Practice “for 7th semester students

Date of activity:-

28-12-2020 to 02-01-2021

Name of Internal Co-ordinator:-

Mr. Saurabh K Singh

Mode of Activity:-

Online (Through Open Learn Platform)

Total no. of participants:-

60

Activity Details :-

Electrical Engineering Department conducted the online certification course titled “STRATEGIC PLANNING: SYSTEMS THINKING IN PRACTICE” for 7th semester students during 28-12-2020 to 02-01-2021. The objectives of this course is-

- Understand systems thinking as conceptual boundary setting
- Understand ‘thinking strategically’ in terms of situations of change, agency of change and tools for managing change
- Distinguish between difficult and messy situations and explain their significance to strategic thinking
- Describe a system in terms of entities (variables) and purposefulness
- Describe four perspectives on systems thinking in terms of situations of use and users of systems approaches.

photographs:-

Statement of participation

PRIYANKA Siriya

has completed the free course including any mandatory tests for:

Strategic planning: systems thinking in practice

Strategic planning: systems thinking in practice

<https://www.open.edu/openlearn/science-maths-technology/strategic-planning-systems-thinking-practice/content-section-overview>

Course summary

Strategic planning: systems thinking in practice is a free course introducing core ideas of systems thinking in practice for managing and improving complex situations. The ideas correspond with three core activities of, firstly, understanding inter-relationships, secondly, engaging with multiple perspectives, and thirdly, reflecting on boundary judgements.

Learning outcomes

By completing this course, the learner should be able to:

define systems in terms of inter-related entities

distinguish ‘systems of interest’ as bounded conceptual constructs for understanding and improving real world ‘situations of interest’

appreciate systems thinking in practice as involving understanding inter-relationships, engaging with multiple perspectives, and reflecting on boundary judgements

appreciate systemic failure in terms of entrapments with conventional strategic thinking towards reductionism, dogmatism, as well as entrapped claims towards holism and pluralism

recognise tools associated with five well-established systems approaches

Details of data recorded:-

Sr. No.	Details of document record	Record present	Remark
1	Circular /Notices Made	Yes	Notice is present.
2	Completion Certificate	Yes	Soft copy of students certificates are available and sample copies has been attached.
3	Photographs	Yes	All related photographs are collected.



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DEPARTMENT OF ELECTRICAL ENGINEERING

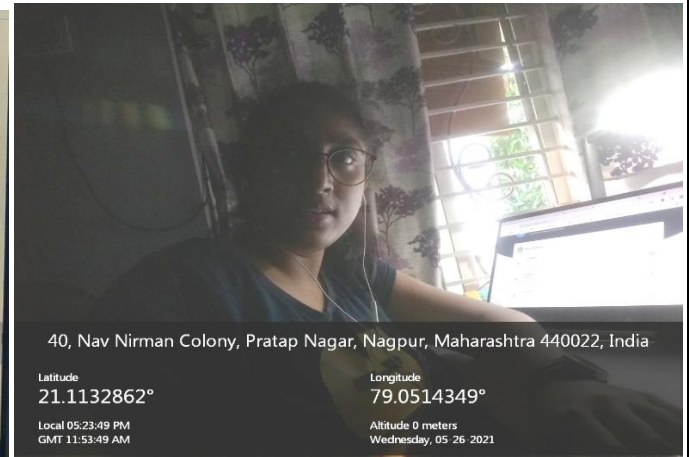
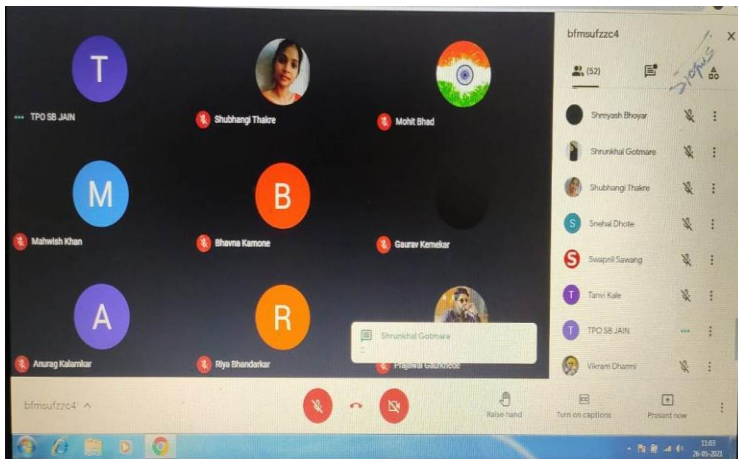
Vision: Transform knowledge seekers to globally competent professionals in Electrical Engineering



Report Activity **(Session 2020-2021)**

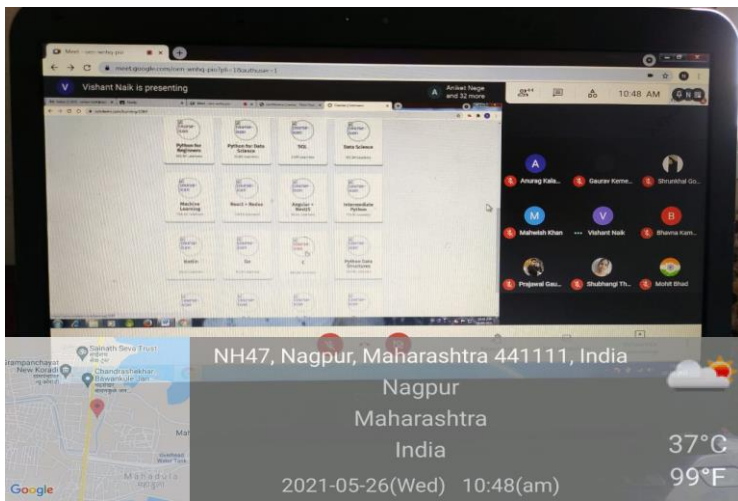
Name of the Activity: -	Certification Course on C Programming & Python for beginners through Solo Learn Platform for Sixth semester students (70 Hours Course)
Date of Activity: -	24/06/2021-
Name of Internal Coordinator: -	Mr. Vishant G. Naik Mrs. Indrayani Patle Ms. Bhagyashree Mudaliar
Online Platform: -	Sololearn Platform (https://www.sololearn.com/learning)
Purpose of Activity: -	To enhance technical knowledge of students about C Programming and Python tracked by Mock Test & Interview apprehended by domain expert based on the following matters: <ul style="list-style-type: none">▪ Basic Concepts▪ Conditionals and Loops▪ Functions, Arrays and Pointers▪ Strings & Function Pointers▪ Structures and Unions▪ Memory Management▪ Files and Error Handling▪ The preprocessor▪ Control Flow▪ Lists & Functions etc.,
No of students Participated:-	67 students (Out of 69)

Photographs: -

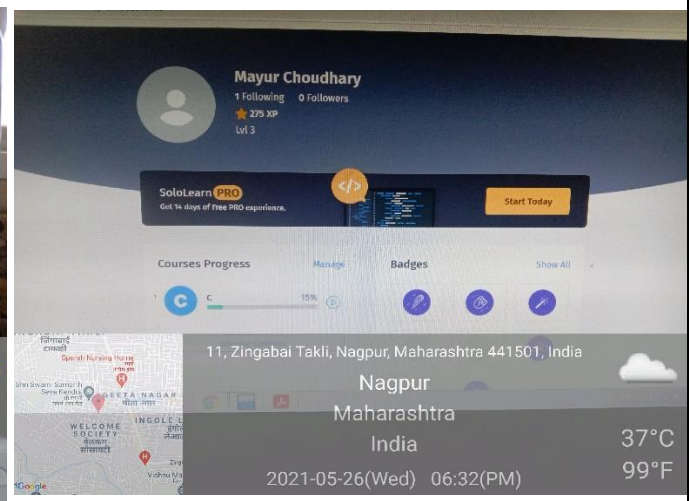


40, Nav Nirman Colony, Pratap Nagar, Nagpur, Maharashtra 440022, India

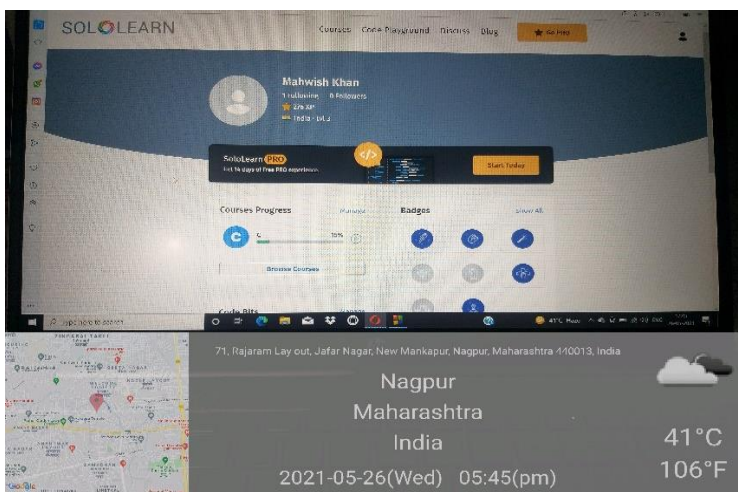
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Local 05:23:49 PM Altitude 0 meters
GMT 11:53:49 AM Wednesday, 05/26/2021



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2021-05-26(Wed) 06:32(PM)



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Details of data documented: -

Sr.No.	Details of Document	Record Present	Remark
1	Circular /Notices Made	Yes	Circular attached
2	Course Content/ Details	Yes	Course Details attached
3	Attendance record of students	Yes	Consolidated Attendance sheet attached
4	Impact Details of Program	Yes	Pre and Post Impact analysis of Program based on students' responses attached
5	Feedback	Yes	Feedback analysis based on students' responses attached
6	Completion Certificate	Yes	Sample Completion Certificate of each course attached
7	Photographs	Yes	All related photographs are collected.



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Report Activity (Session 2020-21)

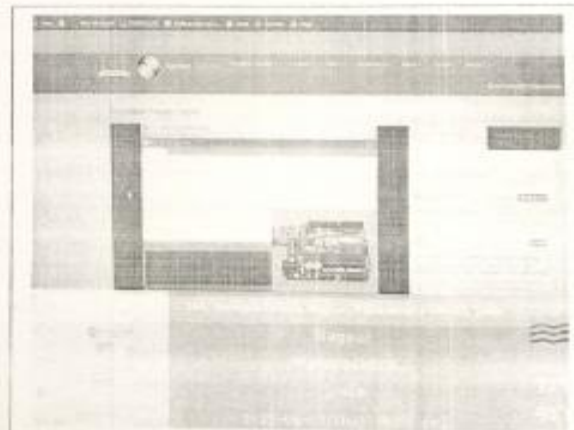
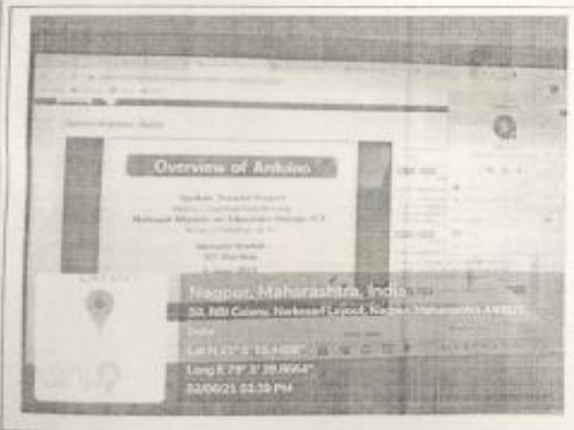
Name of the activity:-	Certification course on Arduino Fundamentals for 2 nd year/ 4 th semester students
Date of activity:-	02-06-2021 to 12-06-2021
Name of Internal Co-ordinator:-	Mr. A A Khan
Mode of Activity:-	Online (Through Spoken Tutorial IIT Bombay)
Total no. of participants:-	56

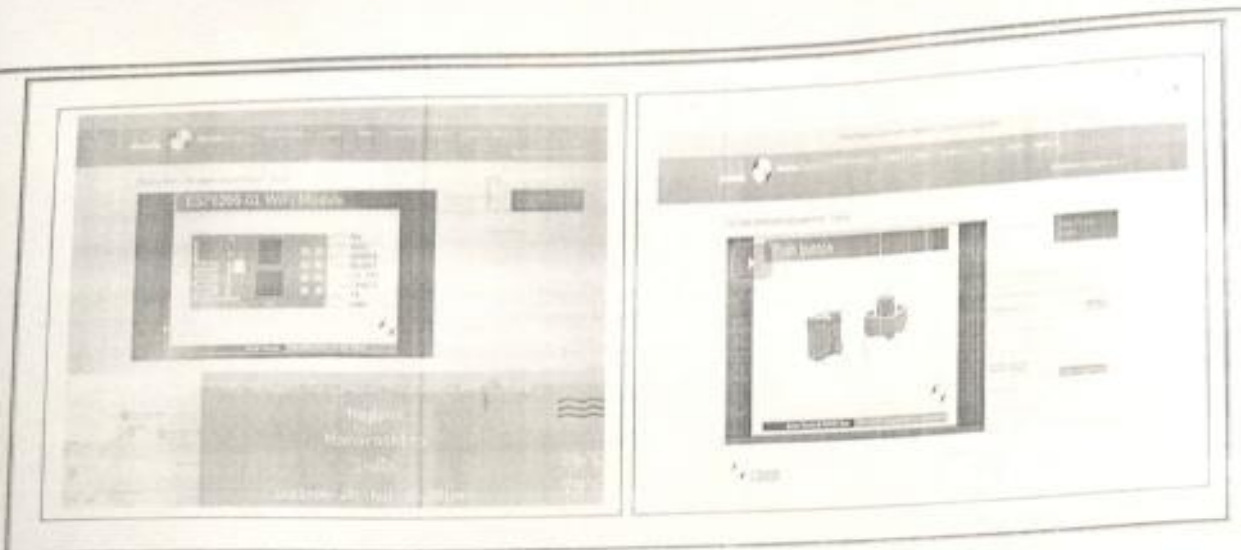
Activity Details:

The department of Electrical Engineering has conducted the Certification course on Arduino Fundamentals for 2nd year/ 4th semester students from 02-06-2021 to 12-06-2021. Through this course, the students have got the knowledge and experience of:

- 1) Arduino programming fundamentals with C language.
- 2) Circuit Building on a breadboard
- 3) Control sensors, robots, and Internet of Things (IoT) devices using Arduino
- 4) Write programs that perform basic math, light up LEDs, and control motors


Photographs:





Details of data recorded:

Sr. No.	Details of document record	Record present	Remark
1	Circular /Notices Made	Yes	
2	Attendance record of students	Yes	Online sheet is available
3	Completion Certificate	Yes	Soft copy of students certificates are available and sample copies has been attached.
4	Photographs	Yes	All related photographs are collected.


Dr. Pankaj B. Thote
HOD, EE



S. B. JAIN INSTITUTE OF TECHNOLOGY, MANAGEMENT & RESEARCH, NAGPUR.
DEPARTMENT OF ELECTRICAL ENGINEERING.

Transform knowledge seekers to globally competent professionals in Electrical Engineering.

CAN RENEWABLE ENERGY SOURCES POWER THE WORLD?

Course Code: EE301

Session 2020-21
Second year (3rd Sem)

Certification Course

<u>Sr. No.</u>	<u>TOPIC</u>	<u>Date</u>	<u>Time</u>
	I. INTRODUCING RENEWABLE ENERGY		
1.	<ol style="list-style-type: none">1. Defining sustainable and renewable energy.<ol style="list-style-type: none">1.1 Renewed interest in renewables.2. Energy definitions and concepts.3. Renewable energy from the Sun.4. Energy supply and demand: world and UK.5. Fossil fuels, greenhouse gases and climate change.	26/12/2020	10:30 am to 1:30 pm
	<ol style="list-style-type: none">6. Overview of renewable energy sources.7. EU and UK renewable energy prospects 2020–2030.8. Case study: Scotland aims for 100% renewable electricity by.9. Quiz-1.10. Summary		
	II. SOLAR ENERGY FOR HEATING AND DAYLIGHTING		
2.	<ol style="list-style-type: none">1. Solar thermal energy and daylighting.2. Direct and diffuse solar radiation.3. Passive solar heating of buildings.4. Daylighting.5. Active solar heating.6. Varieties of solar collector.	26/12/2020	2:30 pm to 5:30 pm
	<ol style="list-style-type: none">7. Solar district heating.8. Heat pumps9. Solar thermal electricity generation.10. Quiz-2.11. Summary12. Practice quiz-1.		
3.	III. SOLAR PHOTOVOLTAICS		

	<ol style="list-style-type: none"> 1. Basic physical principles of photovoltaics. 2. Photovoltaic materials and technologies. 3. Photovoltaic systems for remote power. 4. PV systems for houses. 5. PV systems for non-domestic buildings. 6. Large PV power plants. 7. Energy yield from PV systems. 8. PV economics and environmental impact. 9. PV integration into electricity systems. 10. The growing world PV market. 11. Quiz-3. 12. Practice quiz-2. 	28/12/2020	10:30 am to 1:30 pm
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<u>Sr. No.</u>	<u>TOPIC</u>	<u>Date</u>	<u>Time</u>
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IV. BIOENERGY			
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4.	<ol style="list-style-type: none"> 1. Introducing bioenergy 2. Biomass as a solar energy store. 3. Biomass as a fuel. 4. Biomass energy from plants. 5. Secondary biomass energy from wastes, residues and co-products. 6. Biomass processing. 7. Environmental impact of bioenergy. 8. Energy balance of bioenergy. 9. Costing bioenergy. 10. Future prospects for bioenergy. 11. Quiz-4. 11. 12 Summary. 12. Compulsory badge quiz-1. 	28/12/2020	2:30 pm to 5:30 pm
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V. HYDROELECTRICITY			
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5.	<ol style="list-style-type: none"> 1. Background to hydroelectricity. 2. Hydropower resources – world, regional, national. 3. World hydro output. 4. Small-scale hydro. 5. Stored energy and available power. 6. Types of hydroelectric plant. 7. Types of hydro turbine. 8. Hydro as a component of a power system. 9. Environmental impact of hydroelectricity. 10. Economics of hydroelectricity. 11. Future prospects for hydroelectricity. 12. Quiz-5. 13. Summary. 14. Practice quiz-3. 	29/12/2020	10:30 am to 1:30 pm
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VI. WIND ENERGY			
6.	<ol style="list-style-type: none"> 1. The origins of wind and atmospheric pressure. 2. Energy and power in the wind. 3. Wind turbine types. 4. Aerodynamics of wind turbines. 5. Power and energy from wind turbines. 6. Environmental impact of wind energy. 7. Calculating the costs of wind energy. 8. Offshore wind energy. 9. Future prospects for wind energy. 10. Quiz-6. 11. Summary. 12. Practice quiz-4 	29/12/2020	2:30 pm to 5:30 pm
VII. WAVE ENERGY			
7.	<ol style="list-style-type: none"> 1. The physical principles of wave energy. 2. Wave energy resources. 3. Wave energy technologies. 4. Wave energy economics. 5. Environmental impact of wave energy technology. 6. Grid integration of wave energy. 7. Conclusions. 8. Quiz-7. 9. Summary. 10. Practice quiz-5 	30/12/2020	10:30 am to 1:30 pm
VIII. TOWARDS A RENEWABLE FUTURE			
8.	<ol style="list-style-type: none"> 1. UK renewable energy futures. 2. Balancing renewable supply and demand. 3. Pathways to 2050. 4. Renewable energy futures for Denmark. 5. Renewable energy futures for Germany. 6. Renewable energy scenarios for Europe. 7. European supergrids and DESERTEC. 8. Can renewables power the world?. 9. Summary and conclusions. 10. End of course quiz. 11. End of course summary. 12. Compulsory badge quiz-2 	30/12/2020	2:30 pm to 5:30 pm

Link for the course: <https://www.open.edu/openlearn/ocw/mod/oucontent/view.php?id=73765>





ELEMENTARY ATTITUDES ABOUT ELECTRONIC APPLICATIONS

Course Code:EE 501

Certification Course

Session 2020-2021

Third year (5thSem)

LEARNING OUTCOMES

After studying this course, student will be able to:

1. Understand the mathematical representations and techniques for manipulating of signals in the time and frequency domains
2. Explain the application, benefits and limitations of communications, control and signal processing techniques in real world applications
3. Select and apply appropriate techniques to the analysis of time-varying signals represented in both the time and frequency domain
4. Apply digital filter to remove Gaussian noise from a signal.

<u>DAY</u>	<u>TOPIC</u>	<u>Date</u>	<u>Time</u>
1.	<u>I. Introduction to Electronics applications</u>	28/12/2020	10:30 am to 01:30 pm
	1. Subsystems components <i>1.1 Sensors</i> <i>1.2 Processors</i> <i>1.3 Communication</i> <i>1.4 Processors</i> <i>1.5 Display</i>		
	2. Subsystems categorization <i>2.1 Signal processing</i> <i>2.2 Communication</i>		
	<u>II. Signal processing</u>		

	1. Frequency-dependent gain <i>Activity 1</i> 2. Gain functions of ideal filters 3. Types of interference <i>Activity 2</i> 4. First-order filters <i>Activity 3</i>	28/12/2020	02:30 am to 05:30 pm
	5. Normalised first-order low-pass filters <i>Activity 4</i> <i>Activity 5</i> 6. The full Bode plot: gain and phase 7. Chebyshev and Butterworth filters	29/12/2020	10:30 am to 01:30 pm
III. <u>Digital signal processing</u>			
2.	1. Digital filters 2. Characteristics of discrete-time and continuous-time signals <i>Activity 6</i> 3. Sampling a continuous-time signal 4. Quantisation of a signal <i>Activity 7</i> 5. Digital filtering in the time domain <i>Activity 8</i> 6. Designing a digital filter in the frequency domain	29/12/2020	02:30 am to 05:30 pm
<u>Digital signal processing</u>			
3.	7. Fourier transforms and the sinc pulse 8. A low-pass filter design 9. Digital filtering in practice 10. Adding noise <i>Activity 9</i> 11. Changing the decision level <i>Activity 10</i> <i>Activity 11</i> 12. Applying the FIR filter <i>Activity 12</i>	30/12/2020	10:30 am to 01:30 pm 02:30 am to 05:30 pm

IV. Hands-on experiments based on digital signal processing through virtual laboratory platform [http://vlabs.iitkgp.ernet.in/dsp/#]			
4.	1. Study of sampling theorem, effect of undersampling. <i>The principal objective of this hands-on experiment is to understand the principle of sampling of continuous time analog signal.</i>	01/01/2021	10:30 am to 01:30 pm
	2. Study of Quantization of continuous-amplitude, discrete-time analog signals. <i>The principal objective of this hands-on experiment is to understand the principle of quantization of continuous-amplitude discrete-time analog signals</i>		02:30 am to 05:30 pm
Hands-on experiments based on digital signal processing through virtual laboratory platform [http://vlabs.iitkgp.ernet.in/dsp/#]			
5.	3. Study of FIR filter design using window method: Lowpass and highpass filter. <i>This hands-on experiment enables a student to learn:</i> <ul style="list-style-type: none"> • Basics of filter designs and different types of filter designing techniques. • Different types of window functions. • Designing of Lowpass and highpass FIR filters using these window functions 	02/01/2021	10:30 am to 01:30 pm
	4. Study of FIR filter design using window method: Bandpass and Bandstop filter. <i>This hands-on experiment enables a student to understand</i> <ul style="list-style-type: none"> • Basics of filter designs and different types of filter designing technique. • Different types of window functions. • Designing of bandpass and bandstop FIR filters using these window functions. ❖ Conclusion and Summary		02:30 am to 05:30 pm

Link for the course:

<https://www.open.edu/openlearn/science-maths-technology/electronic-applications/content-section-1>

Link for Hands-on experiments:

<http://vlabs.iitkgp.ernet.in/dsp/#>

HOD, EE



Planning: Systems Thinking In Practice

Course Code: EE 701

Session 2020-21
Second year (7TH Sem)

Certification Course

LEARNING OUTCOMES

After studying this course, student will be able to:

- Understand systems thinking as conceptual boundary setting
- Understand ‘thinking strategically’ in terms of situations of change, agency of change and tools for managing change
- Distinguish between difficult and messy situations and explain their significance to strategic thinking
- Describe a system in terms of entities (variables) and purposefulness
- Describe four perspectives on systems thinking in terms of situations of use and users of systems approaches.

<u>DAY</u>	<u>TOPIC</u>	<u>Date</u>	<u>Time</u>
1	Systems approaches for thinking (in practice) 1 Strategy making: bells that still can ring <ul style="list-style-type: none"> • system dynamics (SD) • viable system model (VSM) • strategic options development and analysis (SODA) • soft systems methodology (SSM) • critical systems heuristics (CSH) 	28/12/2020	10:30 am to 1:30 pm
	2 Tools, people and their situations <ul style="list-style-type: none"> • situation – comprising the arena of change and real-world complexities • practitioners – people effecting change in the situation • ideas – conceptual constructs developed by people for effecting change. 	28/12/2020	2:30 pm to 5:30 pm
	3 Situations, systems and strategy <ul style="list-style-type: none"> • strategy concerns both organization and environment (perspectives) • the substance of strategy is complex (variables) 	29/12/2020	10:30 am to 1:30 pm

2	<ul style="list-style-type: none"> • strategy affects overall welfare of the organisation (perspectives) • strategy involves issues of both content and process (variables) • strategies are not purely deliberate (perspectives) • strategies exist on different levels (variables) • Strategy involves thought processes (perspectives). 		
	<p>Schools of strategic management</p> <p>There are five prescriptive schools with a practitioner focus on the process of strategy making:</p> <ul style="list-style-type: none"> • The design school, which sees strategic management as a process of attaining a fit between the internal capabilities and external possibilities of an organization • The planning school, which extols the virtues of formal strategic planning involving analyses and checklists • The positioning school, which stresses the strategic need for positioning an organisation in the market and within its industry • The entrepreneurial school, which emphasises the central role played by the leader • The cognitive school, which looks inwards into the minds of strategists. 	29/12/2020	2:30 pm to 5:30 pm
3	<p>Schools of strategic management</p> <p>There are five descriptive schools with a focus more on the situation in which strategies emerge:</p> <ul style="list-style-type: none"> • The learning school, which sees strategy as an emergent process – strategies emerge as people come to learn about a situation as well as their organization’s capability of dealing with it • The power school, which views strategy emerging out of power games within the organisation and outside it • The cultural school, which views strategy formation as a process rooted in the social force of culture • The environmental school, which believes that a firm’s strategy depends on events in the environment and the company’s reaction to them • The configuration school, which views strategy as a process of transforming the organisation – it describes the relative stability of strategy, interrupted by 	30/12/2020	10:30 am to 01:30 pm

	occasional and dramatic leaps to new ones. (Source: adapted from Chakravarty, 2005)		
	<p>Thinking strategically in practice</p> <ul style="list-style-type: none"> • understanding inter-relationships • engaging with multiple perspectives • reflecting on boundary judgments <p>features of systems practice: a core exercise in <i>modeling</i> involving a process of value creation</p> <ul style="list-style-type: none"> • Modeling and value creation • Reflective practice • Competencies 	30/12/2020	2:30 pm to 5:30 pm
4	<p>Practical traps in systems thinking</p> <p>Trap 1 Dealing with reductionism</p> <p>Trap 2 Dealing with dogmatism</p> <p>Trap 3 Dealing with holism and pluralism</p> <p>systems approaches were chosen on the basis of their respective emphasis on purpose and usefulness. that can be summarized:</p> <ul style="list-style-type: none"> • Understanding interrelationships and interdependencies • Practice in engaging with different perspectives • Responsibly questioning judgments on interrelationships and perspectives. 	01/01/2021	10:30 am to 1:30 pm
	<p>Your area of practice</p> <p>To appreciate the value of each approach it is helpful to have situations embedded in:</p> <ul style="list-style-type: none"> • A common area of practice for applying any or all five approaches • An area of practice that is of particular interest to you. 	01/01/2021	2:30 pm to 5:30 pm
Case study			
5	<p>Prepare a case study based on above topic and it should include</p> <ul style="list-style-type: none"> • Strategic Plan Development (Strategy making, Tools, people and their situations, systems and strategy) • Implementation of strategies (live example of a company) 	02/01/2021	10:30 am to 01:30 pm &

			02:30 am to 05:30 pm

Link for the course:

<https://www.open.edu/openlearn/science-maths-technology/strategic-planning-systems-thinking-practice/content-section-overview?active-tab=description-tab>



HOD, EE



S. B. JAIN INSTITUTE OF TECHNOLOGY, MANAGEMENT & RESEARCH, NAGPUR.

(An Autonomous Institute, Affiliated to RTMNU, Nagpur)

DEPARTMENT OF ELECTRICAL ENGINEERING

Vision: Transform knowledge seekers to globally competent professionals in Electrical Engineering



Session 2020-2021

Sixth Semester/Third Year

Certification Course



C programming & Python for beginners

W.e.f. 26/05/2021

Sr. No.	Day & Date	Time	Course Content/Details	
1	Day 1 26/05/2021 (Wednesday)	10:30 p.m. to 12:30 p.m.	<ul style="list-style-type: none"> ➤ Orientation Program [Head of the Department, Electrical Engineering, S.B.J.I.T.M.R.] ➤ Webinar on "Campus Recruitment Prospects" [Training & Placement Officer, S.B.J.I.T.M.R.] 	
		C Programming (32 Hours) <i>[Platform to access the course:- https://www.sololearn.com/learning]</i>		
		12:30 p.m. to 05:30 p.m.	<ul style="list-style-type: none"> ➤ Module 1: Basic Concepts (4 Hours) 	
			<ul style="list-style-type: none"> ▪ Introduction to C language ✓ Quizzes 	<ul style="list-style-type: none"> ▪ "Hello World!" program ✓ Hands on Practice & Quizzes
			<ul style="list-style-type: none"> ▪ Data Types ✓ Hands on Practice & Quizzes ▪ Variables and Constants ✓ Hands on Practice & Quizzes 	<ul style="list-style-type: none"> ▪ Input & Output ✓ Hands on Practice & Quizzes ▪ Comments & Operators ✓ Hands on Practice & Quizzes
<ul style="list-style-type: none"> ▪ Quiz 	<ul style="list-style-type: none"> ▪ Course Progress Response 			
2	Day 2 27/05/2021 (Thursday)	12:30 p.m. to 05:30 p.m.	<ul style="list-style-type: none"> ➤ Module 2: Conditionals and Loops (4 Hours) 	
			<ul style="list-style-type: none"> ▪ Conditionals ✓ Hands on Practice & Quizzes ▪ Nested if statements ✓ Hands on Practice & Quizzes 	<ul style="list-style-type: none"> ▪ The switch Statement ✓ Hands on Practice & Quizzes ▪ Logical Operators ✓ Hands on Practice & Quizzes
			<ul style="list-style-type: none"> ▪ The while Loop ✓ Hands on Practice & Quizzes 	<ul style="list-style-type: none"> ▪ The for Loop ✓ Hands on Practice & Quizzes
			<ul style="list-style-type: none"> ▪ Quiz 	<ul style="list-style-type: none"> ▪ Course Progress Response
			<ul style="list-style-type: none"> ➤ Module 3: Functions, Arrays and Pointers (4 Hours) 	

3	Day 3 28/05/2021 (Friday)	12:30 p.m. to 05:30 p.m.	▪ Functions	▪ 2-dimensional arrays
			✓ Hands on Practice & Quizzes	✓ Hands on Practice & Quizzes
			▪ Recursive Functions	▪ Pointers
			✓ Hands on Practice & Quizzes	✓ Hands on Practice & Quizzes
			▪ Arrays	▪ Functions and Arrays
			✓ Hands on Practice & Quizzes	✓ Hands on Practice & Quizzes
			▪ Module 3 Quiz	▪ Course Progress Response
<u>Recess:-1:30 p.m. to 2:30 p.m.</u>				

Sr. No.	Date	Time	Course Content/Details	
4	Day 4 29/05/2021 (Saturday)	12:30 p.m. to 05:30 p.m.	➤ Module 4: Strings & Function Pointers (4 Hours)	
			▪ Strings	▪ Function Pointers
			✓ Hands on Practice & Quizzes	✓ Hands on Practice & Quizzes
			▪ String Functions	▪ Void Pointers
			✓ Hands on Practice & Quizzes	✓ Hands on Practice & Quizzes
			▪ Quiz	▪ Course Progress Response
5	Day5 31/05/2021 (Monday)	12:30 p.m. to 05:30 p.m.	➤ Module 5: Structures and Unions (4 Hours)	
			▪ Structures	▪ Unions
			✓ Hands on Practice & Quizzes	✓ Hands on Practice & Quizzes
			▪ Working with structures	▪ Working with Unions
			✓ Hands on Practice & Quizzes	✓ Hands on Practice & Quizzes
			▪ Quiz	▪ Course Progress Response
6	Day 6 (01/06/2021) (Tuesday)	12:30 p.m. to 05:30 p.m.	➤ Module 6: Memory Management (4 Hours)	
			▪ Working with memory	▪ Calloc and realloc
			✓ Hands on Practice & Quizzes	✓ Hands on Practice & Quizzes
			▪ The malloc function	▪ Dynamic strings and arrays
			✓ Hands on Practice & Quizzes	✓ Hands on Practice & Quizzes
			▪ Quiz	▪ Course Progress Response
7	Day 7 (02/06/2021) (Wednesday)	12:30 p.m. to 05:30 p.m.	➤ Module 7: Files and Error Handling (4 Hours)	
			▪ Working with Files	▪ Error Handling
			✓ Hands on Practice & Quizzes	✓ Hands on Practice & Quizzes
			▪ Binary File I/O	▪ Using error codes
			✓ Hands on Practice & Quizzes	✓ Hands on Practice & Quizzes
			▪ Quiz	▪ Course Progress Response
8	Day 8 (03/06/2021) (Thursday)	12:30 p.m. to 05:30 p.m.	➤ Module 8: The preprocessor (4 Hours)	
			▪ Preprocessor Directives	▪ Preprocessor Operators
			✓ Hands on Practice & Quizzes	✓ Hands on Practice & Quizzes
			▪ Conditional Compilation Directives	✓ Hands on Practice & Quizzes
			▪ Quiz	▪ Overall Course Response and Course Completion Certificate submission.

9	<u>Day 9</u> 04/06/2021 (Friday)	10:30 p.m. to 05:30 p.m.	➤ Assessment of Course (C-Programming) by Training & Placement Department based on MCQ test and Mock Interview	
10	<u>Day 10</u> 05/06/2021 (Saturday)	12:30 p.m. to 05:30 p.m.	Python Programming for Beginners (24 Hours) <i>[Platform to access the course:- https://www.sololearn.com/learning]</i>	
			➤ Module 1: Basic Concepts (4 Hours)	
			<ul style="list-style-type: none"> ▪ Introduction to Python ✓ Quizzes ▪ "Hello World!" program ✓ Hands on Practice & Quizzes 	<ul style="list-style-type: none"> ▪ Simple operations ✓ Hands on Practice & Quizzes ▪ Data types ✓ Hands on Practice & Quizzes
			<ul style="list-style-type: none"> ▪ Exponentiation ✓ Hands on Practice & Quizzes 	<ul style="list-style-type: none"> ▪ Quotient & Remainder ✓ Hands on Practice & Quizzes
			<ul style="list-style-type: none"> ▪ Quiz 	<ul style="list-style-type: none"> ▪ Course Progress Response

Sr. No.	Date	Time	Course Content/Details	
11	<u>Day11</u> 07/06/2021 (Monday)	12:30 p.m. to 05:30 p.m.	➤ Module 2: Strings (4 Hours)	
			<ul style="list-style-type: none"> ▪ Strings ✓ Hands on Practice & Quizzes 	<ul style="list-style-type: none"> ▪ New Lines ✓ Hands on Practice & Quizzes
			<ul style="list-style-type: none"> ▪ String Operations ✓ Hands on Practice & Quizzes 	
			<ul style="list-style-type: none"> ▪ Quiz 	<ul style="list-style-type: none"> ▪ Course Progress Response
12	<u>Day 12</u> (08/06/2021) (Tuesday)	12:30 p.m. to 05:30 p.m.	➤ Module 3: Variables (4 Hours)	
			<ul style="list-style-type: none"> ▪ Variables ✓ Hands on Practice & Quizzes 	<ul style="list-style-type: none"> ▪ Taking User Input ✓ Hands on Practice & Quizzes
			<ul style="list-style-type: none"> ▪ Working with Variables ✓ Hands on Practice & Quizzes 	<ul style="list-style-type: none"> ▪ Working with Input ✓ Hands on Practice & Quizzes
			<ul style="list-style-type: none"> ▪ In-Place Operators ✓ Hands on Practice & Quizzes 	
			<ul style="list-style-type: none"> ▪ Quiz 	<ul style="list-style-type: none"> ▪ Course Progress Response
13	<u>Day 13</u> (09/06/2021) (Wednesday)	12:30 p.m. to 05:30 p.m.	➤ Module 4: Control Flow (4 Hours)	
			<ul style="list-style-type: none"> ▪ Booleans & Comparisons ✓ Hands on Practice & Quizzes 	<ul style="list-style-type: none"> ▪ else statements ✓ Hands on Practice & Quizzes
			<ul style="list-style-type: none"> ▪ if statements ✓ Hands on Practice & Quizzes 	<ul style="list-style-type: none"> ▪ Booleans Logic ✓ Hands on Practice & Quizzes
			<ul style="list-style-type: none"> ▪ While Loops ✓ Hands on Practice & Quizzes 	<ul style="list-style-type: none"> ▪ Break and continue ✓ Hands on Practice & Quizzes
			<ul style="list-style-type: none"> ▪ Quiz 	<ul style="list-style-type: none"> ▪ Course Progress Response
14	<u>Day 14</u> (10/06/2021) (Thursday)	12:30 p.m. to 05:30 p.m.	➤ Module 5: Lists (4 Hours)	
			<ul style="list-style-type: none"> ▪ Lists ✓ Hands on Practice & Quizzes 	<ul style="list-style-type: none"> ▪ List operations ✓ Hands on Practice & Quizzes
			<ul style="list-style-type: none"> ▪ Strings as Lists ✓ Hands on Practice & Quizzes 	<ul style="list-style-type: none"> ▪ For Loops ✓ Hands on Practice & Quizzes

			<ul style="list-style-type: none"> ▪ Ranges ✓ Hands on Practice & Quizzes 	<ul style="list-style-type: none"> ▪ List slices ✓ Hands on Practice & Quizzes
			<ul style="list-style-type: none"> ▪ Quiz 	<ul style="list-style-type: none"> ▪ Course Progress Response
15	<u>Day 15</u> (11/06/2021) (Friday)	12:30 p.m. to 05:30 p.m.	➤ Module 6: Functions (4 Hours)	
			<ul style="list-style-type: none"> ▪ Functions ✓ Hands on Practice & Quizzes 	<ul style="list-style-type: none"> ▪ String Functions ✓ Hands on Practice & Quizzes
			<ul style="list-style-type: none"> ▪ List Functions ✓ Hands on Practice & Quizzes 	<ul style="list-style-type: none"> ▪ Making your own functions ✓ Hands on Practice & Quizzes
			<ul style="list-style-type: none"> ▪ Function Arguments ✓ Hands on Practice & Quizzes ▪ Returning from functions 	<ul style="list-style-type: none"> ✓ Hands on Practice & Quizzes ▪ Comments & Docstrings ✓ Hands on Practice & Quizzes
			<ul style="list-style-type: none"> ▪ Quiz 	<ul style="list-style-type: none"> ▪ Overall Course Response and Course Completion Certificate submission.
16	<u>Day 16</u> (12/06/2021) (Saturday)	10:30 p.m. to 05:30 p.m.	➤ Assessment of Course (Python Programming) by Training & Placement Department based on MCQ test and Mock Interview	



Dr. Pankaj B. Thote
HoD, Electrical Engineering



Session 2020-2021 Fourth Semester/Second Year



**Certification Course
Arduino Fundamentals**

W.e.f. 02/06/2021

Sr. No.	Day & Date	Time	Course Content/Details
1	Day 1 02/06/2021 (Wednesday)	02:00 p.m. to 02:30 p.m.	➤ Orientation Program [Head of the Department, Electrical Engineering, S.B.J.I.T.M.R.]
		<u>Arduino Fundamentals (30 Hours)</u>	
		Platform to access the course:- https://spoken-tutorial.org/tutorial-search/?search_foss=Arduino&search_language=English	
1	Day 1 02/06/2021 (Wednesday)	02:30 p.m. to 05:30 p.m.	➤ Module 1: Introduction to Arduino (6 Hours)
			<ul style="list-style-type: none"> ▪ <u>Overview of Arduino</u> connections ✓ Prerequisites for learning Basic level Arduino ✓ Prerequisites for learning Intermediate level Arduino ▪ <u>Electronic components & connections:</u> ✓ Breadboard & its internal
			<ul style="list-style-type: none"> ✓ LED & its connections, Tri-color LED Resistor, ✓ Simple circuit using LED, resistor & breadboard ✓ Common mistakes when using breadboard
2	Day 2 03/06/2021 (Thursday)	02:30 p.m. to 05:30 p.m.	<ul style="list-style-type: none"> ▪ <u>Arduino device:</u> Microcontroller is used ✓ Features of Arduino ✓ Components of Arduino board ✓ Description of Microcontrollers ✓ Few examples where a
			<ul style="list-style-type: none"> ✓ Installation of Arduino IDE on Ubuntu Linux OS ✓ Run the arduino executable file ✓ The Arduino IDE window
			<ul style="list-style-type: none"> ▪ <u>Course Progress Response</u>
2	Day 2 03/06/2021 (Thursday)	02:30 p.m. to 05:30 p.m.	<ul style="list-style-type: none"> ▪ <u>Arduino components and IDE:</u> ✓ Set up a physical connection between Arduino and a computer ✓ Various components available in Arduino hardware ATMEGA 328 microcontroller chip etc.,
			<ul style="list-style-type: none"> ▪ <u>Arduino Program:</u> ✓ Write an Arduino program to blink an LED ✓ Program to turn on the LED ✓ Compile the program into binary format etc.,
			<ul style="list-style-type: none"> ▪ <u>Course Progress Response</u>
3	Day 3 04/06/2021 (Friday)	02:30 p.m. to 05:30 p.m.	➤ Module 2: Interfacing of peripherals with Arduino (6 Hours)
			<ul style="list-style-type: none"> ▪ <u>Arduino with Tricolor LED and Push button:</u> ✓ Tricolor LED - Common Cathode Tricolor LED Other external
3	Day 3 04/06/2021 (Friday)	02:30 p.m. to 05:30 p.m.	<ul style="list-style-type: none"> ▪ <u>Arduino with LCD:</u> ✓ Connect an LCD to Arduino board ✓ Write the initial setups required for the experiment in the void

			devices that are required etc.,	function etc.,
			<ul style="list-style-type: none"> ▪ Course Progress Response 	

Sr. No.	Date	Time	Course Content/Details	
4	Day 4 05/06/2021 (Saturday)	02:30 p.m. to 05:30 p.m.	<ul style="list-style-type: none"> ▪ Display counter using Arduino: ✓ Connect an LCD and a Push button to Arduino board. ✓ Write a program in the Arduino IDE, write the code for void loop 	<ul style="list-style-type: none"> ▪ Seven Segment Display: ✓ Connect a seven-segment display to Arduino board ✓ Program to display digits 0 to 4 in seven segment display
			<ul style="list-style-type: none"> ▪ Course Progress Response 	
			<ul style="list-style-type: none"> ➤ Module 3: Application of Arduino in Communication (6 Hours) 	
5	Day 5 07/06/2021 (Monday)	02:30 p.m. to 05:30 p.m.	<ul style="list-style-type: none"> ▪ Pulse Width Modulation ✓ About Pulse Width Modulation, duty cycle and frequency ✓ Experiment to control the of LED by varying the duty cycle ✓ Experiment to control the speed and direction of a DC motor 	<ul style="list-style-type: none"> ✓ Circuit connection explanation of the above experiments About ✓ Live setup of the connection, Source code for the above brightness experiments, Compile and upload the program, Demonstration of the output
			<ul style="list-style-type: none"> ▪ Course Progress Response 	
6	Day 6 (08/06/2021) (Tuesday)	02:30 p.m. to 05:30 p.m.	<ul style="list-style-type: none"> ▪ Wireless Connectivity to Arduino ✓ About ESP8266-01 WiFi module ✓ Circuit connection of ESP8266 - 01 module with Arduino ✓ Live setup of the connection ✓ Establish a connection between WiFi module and a laptop or a mobile phone 	<ul style="list-style-type: none"> ▪ Analog to Digital Conversion: ✓ About DHT11 sensor, Arduino resolution concepts ✓ Circuit connection details of DHT11 sensor and Arduino ✓ Features of DHT11 & Live setup of the connection ✓ Code to detect the temperature and humidity using DHT11 sensor
			<ul style="list-style-type: none"> ▪ Course Progress Response 	
			<ul style="list-style-type: none"> ➤ Module 4: Introduction to IoT (3 Hours) 	
7	Day 7 (09/06/2021) (Wednesday)	02:30 p.m. to 05:30 p.m.	<ul style="list-style-type: none"> ▪ Introduction to IoT: ✓ About IoT, IoT system components, About Thing speak platform, create an account in Thing speak, Login to the account and create a new channel, Enter the channel information, Show the graph outline, Generate the API keys, Importance of Write API key and Read API key etc., 	<ul style="list-style-type: none"> ▪ Sending data to the cloud using IoT devices: ✓ External components required for sending data to the cloud ✓ About MQTT Protocol ✓ Setup the MB102 module on Breadboard ✓ Program in Arduino IDE for interfacing WiFi module and DHT11 sensor etc.,
			<ul style="list-style-type: none"> ▪ Course Progress Response 	
8	Day 8 (10/06/2021) (Thursday)	02:30 p.m. to 05:30 p.m.	<ul style="list-style-type: none"> ➤ Module 5: Robot (3 Hours) ▪ Assembly of Robot: ✓ Components required to build a Robot ✓ Assembled Robot , About .apk 	<ul style="list-style-type: none"> ▪ Robot Control using Bluetooth ✓ Components required for Bluetooth communication. ✓ Working of the Robot Control the

			file, About MIT App inventor to build an app etc.,	movement of the Robot using Bluetooth communication atc.,
			▪ Course Progress Response	
Sr. No.	Date	Time	Course Content/Details	
9	Day9 11/06/2021 (Friday)	02:30 p.m. to 05:30 p.m.	➤ Module 6: Other Applications of Arduino (6 Hours)	
			<ul style="list-style-type: none"> ▪ <u>Assembly Language Programming:</u> ✓ Write an assembly program to display a digit on seven segment display ✓ Arduino - Assembly code reference ✓ Arduino ATmega328 Pin mapping ✓ Connection circuit details ✓ Installing AVRA and AVRDUDE assembler 	<ul style="list-style-type: none"> ✓ How to connect and check the port number of Arduino ✓ Assembly program to glow the dot LED on the seven-segment display ✓ Assembly program to display digit two on the seven-segment display etc., ▪ <u>Digital Logic Design with Arduino:</u> ✓ Write an assembly to verify the logical AND operation ✓ Use the m328Pdef.inc file that is available in the code files link of this tutorial.
10	Day 10 (12/06/2021) (Saturday)	02:30 p.m. to 05:30 p.m.	▪ <u>AVR-GCC programming through Arduino:</u>	
			<ul style="list-style-type: none"> ✓ Write an assembly program to display a digit on seven segment display ✓ Arduino - Assembly code reference ✓ Arduino ATmega328 Pin mapping 	<ul style="list-style-type: none"> ▪ <u>Interfacing LCD through AVR-GCC programming:</u> ✓ Write an AVR-GCC program to display a digit on LCD, Using avr/io.h, util/delay.h, stdlib.h libraries in the program, Using ClearBit() and SetBit() function
			▪ Overall Assessment (Quiz)	▪ Overall Feedback



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