

Document description:

This document outlines the application of PDCA cycle for transitioning to online learning at KLE Technological University.

Title of the Practice: Bichronous Online Learning model: Blending Asynchronous and Synchronous Online Learning

KLE Technological university leveraged the disruption created by the Covid-19 pandemic to systematically transition to online teaching-learning. The overarching goal was to research existing Blended learning models and develop a model of learning that suits undergraduate engineering education.

The process of transitioning was driven through a PDCA cycle are shown below.

A. PLAN

- 1) To develop and adapt online delivery model that ensures effective student engagement with learning
- 2) To blend asynchronous and synchronous delivery modes
- 3) To institutionalise the model by training faculty members on content development
- 4) To develop content and assessment for courses
- 5) To set-up appropriate infrastructure and digital platforms for developing online content
- 6) To setup review mechanisms to ensure quality of service

B. DO

- 1) To monitor weekly content-creation and updation of content on LMS
- 2) Conduct formative assessment to gauge student learning using post test

C. CHECK

- 1) To monitor student's engagement with the online learning resources
- 2) To monitor attendance of students in synchronous sessions
- 3) To monitor the performance of students in assessments
- 4) To monitor the availability and usage of Learning management system

D. ACT

- 1) To enrich online learning resources by a feed-back mechanism
- 2) To improve student engagement with content

A. Plan

1. To develop and adapt online delivery model that ensures effective student engagement with learning

The model aims to integrated asynchronous and synchronous learning environments to leverage advantages of each environment to attain instructional goals and learning outcomes. The learning experience combines high quality digitised video lectures which are available any time anywhere (asynchronous) and interactive livestream classes (synchronous) that take the learning to the next level. The model has the following components as shown in figure 1.

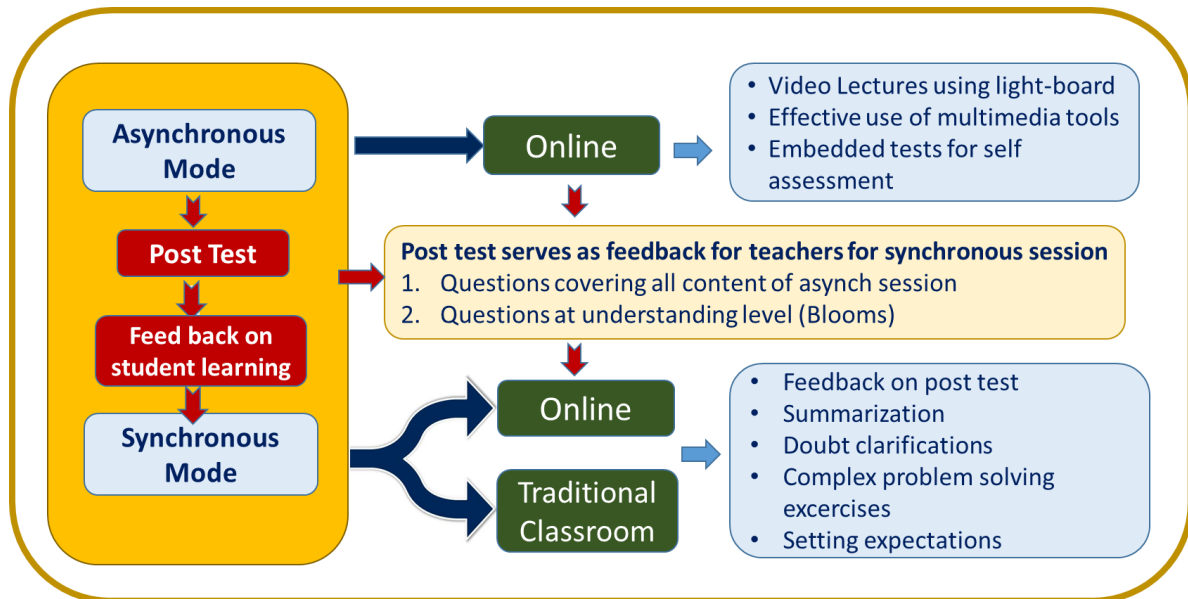


Figure 1 KLE Tech Blended Learning Model

- Asynchronous mode delivery:** The online learning material is systematically prepared and hosted on the online learning platform, Moodle which can be accessed by students using their desktops, laptops or mobiles which allowed for anywhere and anytime learning.
- Synchronous mode delivery:** The asynchronous learning is followed by synchronous live sessions which allows for extensive engagement between teachers and students. These sessions focus on clearing the doubts, problem solving and team exercises to attain deeper learning outcomes. The synchronous sessions were conducted in-person as well as on-line based on whether students were allowed on campus.
- Post-test:** At the end of each topic there will be a well-designed post-test which the students have to take compulsorily. These tests help the students and teachers to comprehend the extent of understanding of the concepts and the content.

2. To blend asynchronous and synchronous delivery modes-

- For resource Asynchronous video content, lesson plan, study materials, and conduction of post-test after watching Asynchronous videos, we are using a customized Moodle-based Learning Management system(LMS) (<https://learn.kletech.ac.in/>)

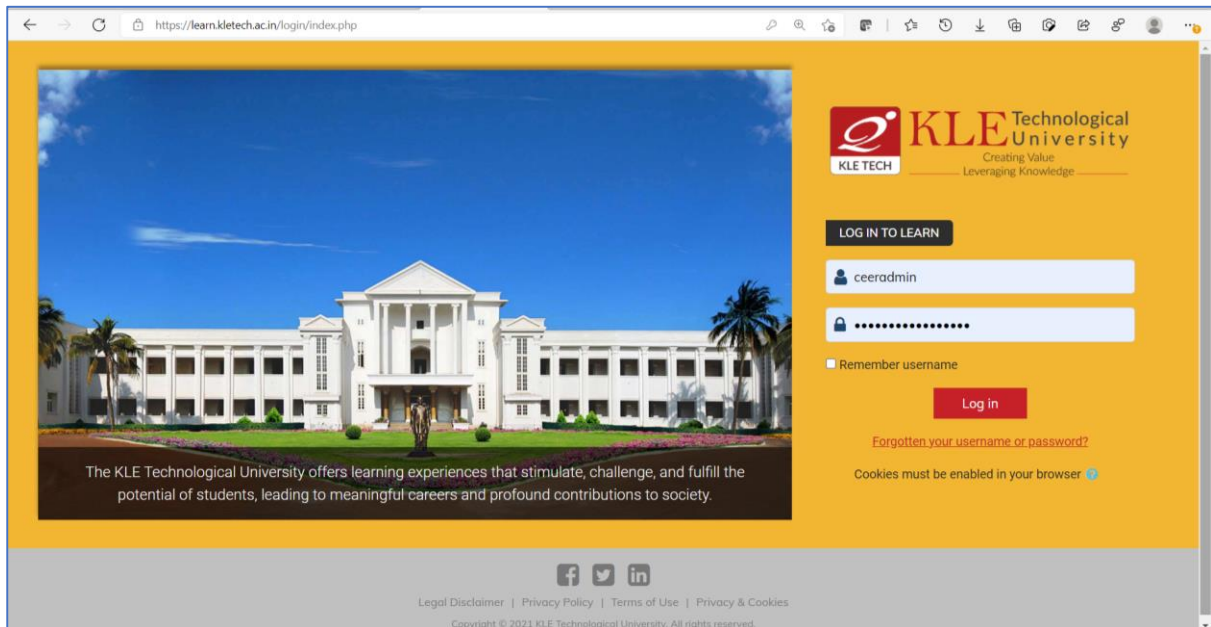


Figure 2: KLE Tech LMS Login page

- For synchronous online delivery, we are using Microsoft Teams (MS Teams).

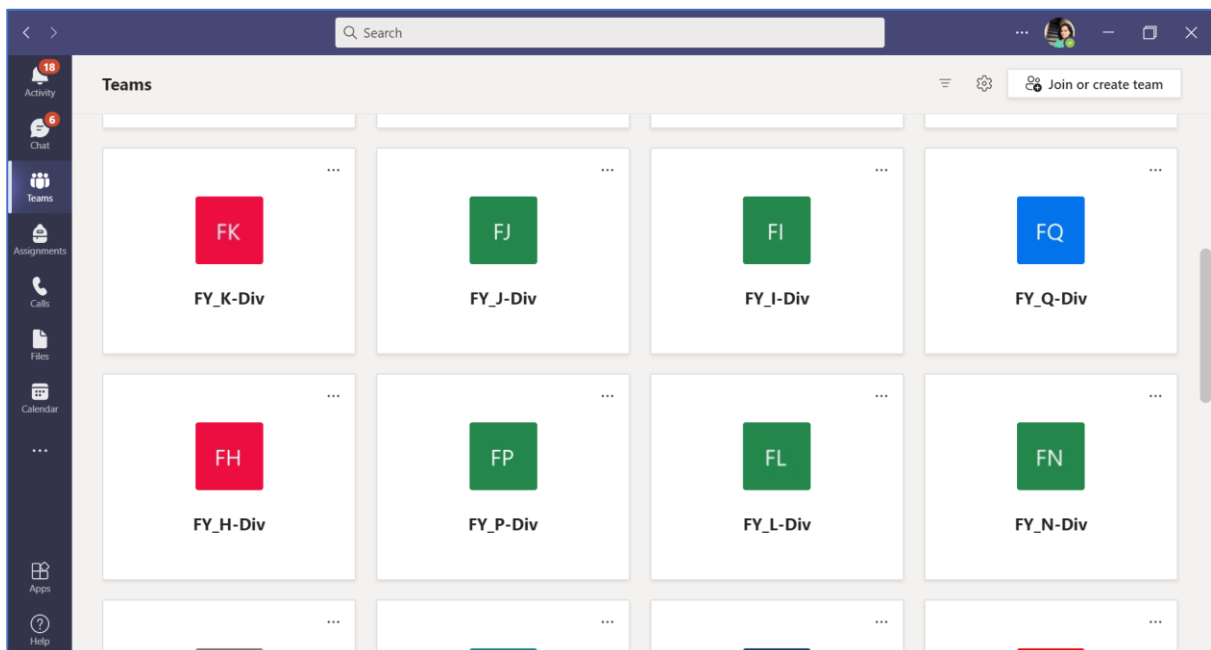


Figure 3: MS Teams Page containing First Year Divisions

3. To institutionalise the model by training faculty members on content development
 The Centre for Engineering Education Research conducted a three-day online program for the faculty of KLE Tech to disseminate the principles and practise for creating a Blended Learning environment. The training focused on the following: -

1. What is Blended Learning?
2. How to create content for online content?
3. Operational aspects of creating a blended learning environment

The training was conducted in three phases during July 9-11, July 13-15 and July 16-18, 2020 as shown in figure 4 and covered all faculty members of the institute and was seen to be effective as seen in their responses in figure 5 and 6.

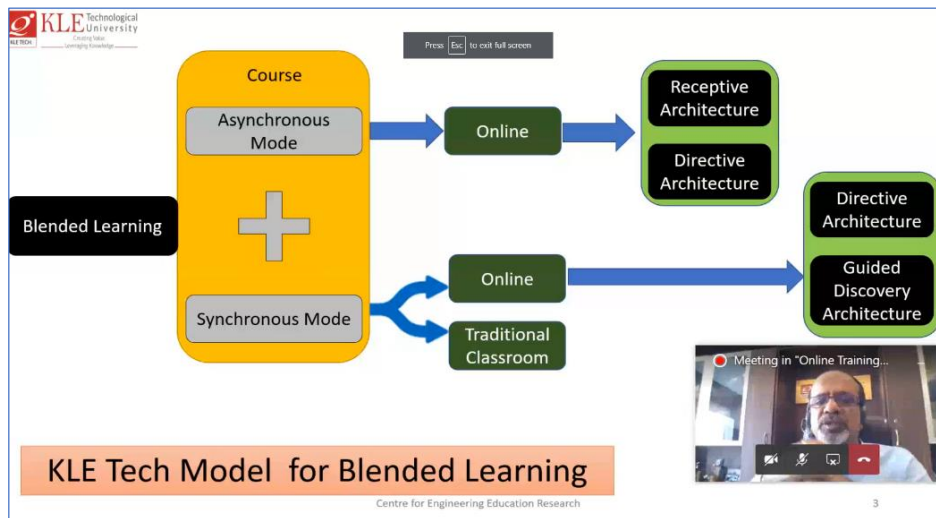


Figure 4: Snapshot of training session

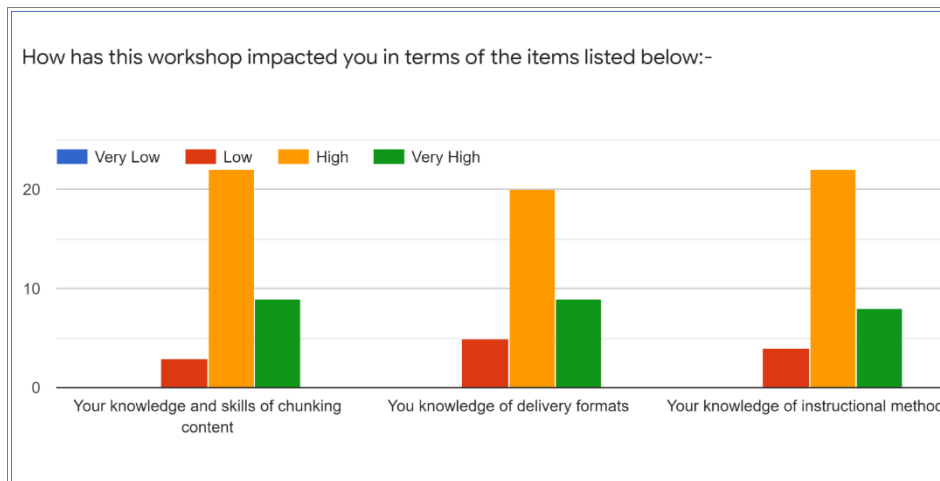


Figure 5: Impact of the workshop in terms of knowledge and skills on chunking, delivery and instructional methods

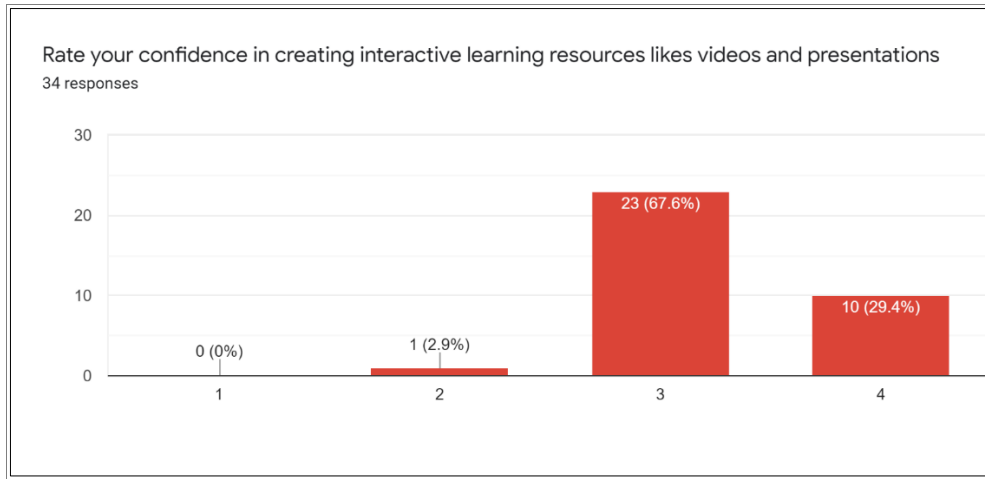


Figure 6: Confidence in creating interactive learning resources

4. To develop content and assessment for courses -chunking, recording, interactive content

58 Week 5							
59 Topic: 3. Stresses in Beams							
Content No	Description	Content Type	Instruction method	Resource format	Duration in minutes	Additional Resources	
61	Content 1 Bending stress: Part1	Concept	Presentation	Interactive Video	7	Notes	
62	Content 2 Bending stress: Part2	Concept	Presentation	Interactive Video	11	Notes	
63	Content 3 Bending stress: Part3	Concept	Presentation	Interactive Video	7	Notes	
64	Content 4 Bending stress: Part4	Concept	Presentation	Interactive Video	12	Notes	
65	Content 5 Problem on Bending stress: Part1	Process	Worked example	Interactive Video	15	Notes	
66	Content 6 Problem on Bending stress: Part2	Process	Worked example	Interactive Video	12	Notes	
67	Content 7 Shear stress in a beam: Part1	Concept	Presentation	Interactive Video	6	Notes	
68	Content 8 Shear stress in a beam: Part2	Concept	Presentation	Interactive Video	15	Notes	
69	Content 9 Variation of Shear stress	Process	Worked example	Interactive Video	10	Notes	
70	Content 10 Problem on Shear stress	Process	Worked example	Interactive Video	12	Notes	
71	Content 11 Shear stress in I-section: Part1	Process	Worked example	Interactive Video	11	Notes	
72	Content 12 Shear stress in I-section: Part2	Process	Worked example	Interactive Video	13	Notes	
73	Test 4			MCQ	10		

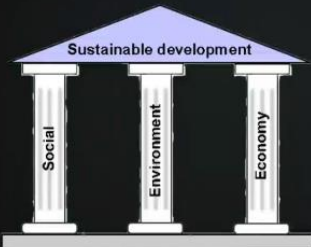
Chunk No	Chunk description	Content type	Appropriate instructional method	Appropriate resource format
1	Global Challenges	Facts	Presentation	Passive video
2	Introduction to Sustainable Development	Facts/Concept	Presentation	Interactive video
3	History and 3 pillars of SD	Facts/Concept	Presentation	Interactive video
4	Role of Engineers	Facts	Presentation	Interactive video
5	Case Study - Woobamboo and Hashbro	Facts	Presentation	Passive video
6	Sustainable Leadership Matrix	Concept	Presentation	Interactive video
7	What is Life Cycle Analysis and its Process?	Process	Presentation	Interactive video
8	What is Carbon footprint	Concept	Presentation	Interactive video
9	Example 1: For electricity	Procedure	Demonstration	Passive Video
10	Example 2: For fuels	Procedure	Demonstration	Passive Video
11	Example 3: For LPG	Procedure	Demonstration	Passive Video

Figure 7a. Chunking Examples – Mechanics of Materials and Engineering Exploration course

↑ Go Back

Role of Engineers and Sustainable Leadership Matrix

Role of Engineers in Sustainable Development




Sustainable development

Social
Environment
Economy

Materials
energy-intensive
natural resources

Environmental perspective?
Social perspective?
Economic perspective?



How can engineers achieve this balance?

When engineers design devices, systems, products, their impact on the environment, society, and economy has to be considered.


3:10 / 15:21


↑ Go Back

15EMEF201_Ch3_W5c1_Part1_Bending stress

Assumptions in Flexural formula

- Pure Bending (Simple Bending)





Sports Buggy

2:12

Figure 7b: Recording Example of Mechanics of Materials and Engineering Exploration course

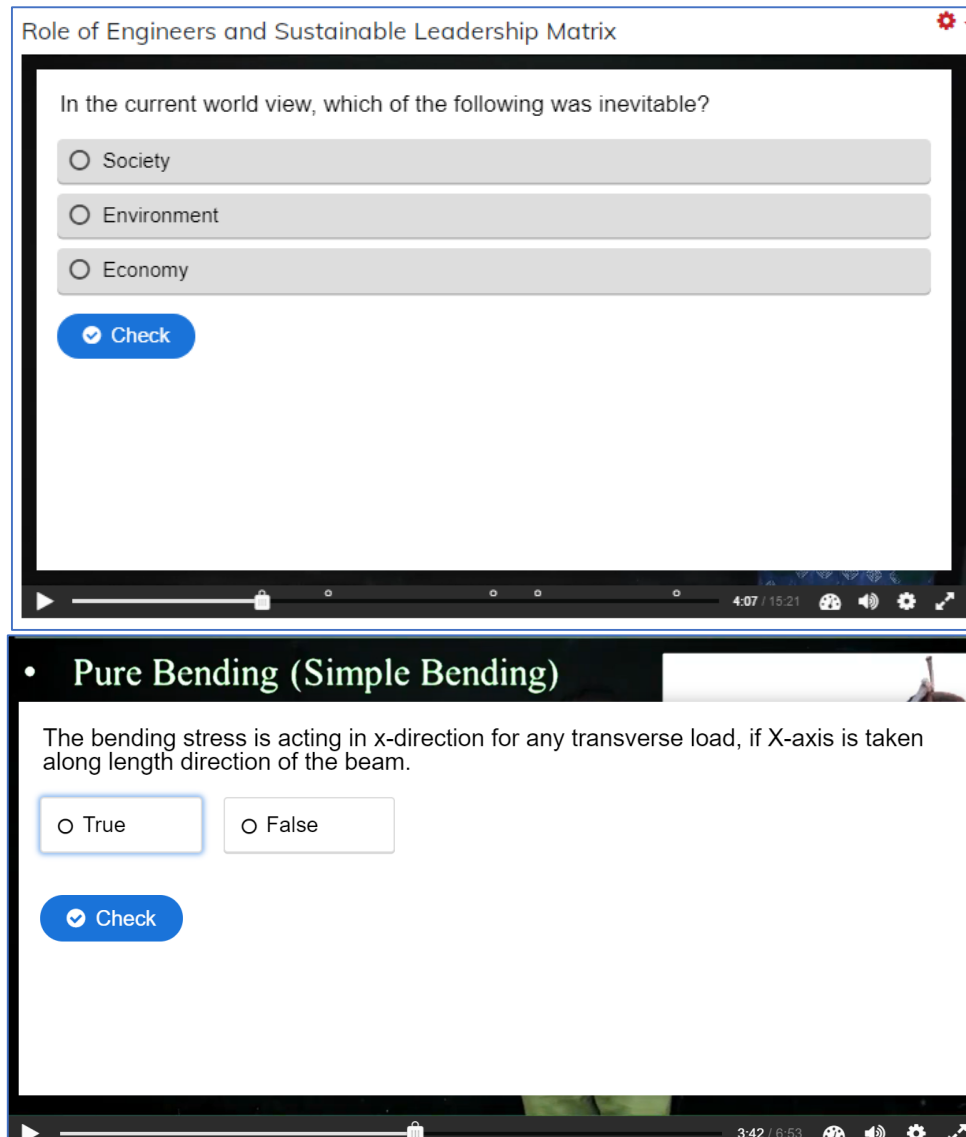


Figure 7c: Interactive Questions

5. To set-up appropriate infrastructure and digital platforms for developing online content

The Light-board is a glass chalkboard impelled full of light. It's for recording video lecture topics. At KLE Technological University, faculty members have Light-board (Glass-board) recording studio as shown in figure 8. These studios offer a new way to create videos for e-learning. The light board technology provides new opportunities for creative use as presenters interpret images, animations and videos; here, presenters can position themselves behind the glass and write key points on it and the writing glows because of fluorescent markers. And presenter can also do a live graphics overlay. Light-board helps in transforming offline classes into online using existing classroom infrastructure with some modifications like making the classroom sound proof and air-conditioning.



Figure 8: Faculty using lightboard technology

6. To setup review mechanisms to ensure the quality of service

The quality of the online learning resources was checked at different points in the content development process module level, course level, pedagogy level and final learning materials.

At the module level, the checks were in place for the following aspects: Course structure, Module, Assignment, Post-test, Quiz, Resource format, task-aids. At the pedagogy level, checks were in place for individual learning activities as well as team-based activities. The last set of checks were in place for learning objects like studio recorded videos, presentations used in the videos and screen cast videos.



Quality Criteria
v1.0_watermark.pdf

B. DO:

1. To monitor **weekly** content-creation and updation of content on LMS

Course Overview

Welcome to Engineering Exploration

Course Outcomes

At the end of the course the student should be able to:

1. Explain the role of an Engineer as a problem solver.
2. Apply multi-disciplinary knowledge and skills to solve complex engineering problems.
3. Build engineering systems using engineering design process.
4. Use basics of project management in doing projects.
5. Analyse engineering solutions from ethical perspectives.
6. Analyse engineering solutions from sustainability perspectives.


Prerequisites

NIL


Course Content

	Duration
Lesson Plan	
Module 1: Introduction to Engineering(Week 1.1)	1 h 29 min
Module 2: Project Management (Week 1.2)	1 h 2 min
Module 3 : Engineering Design (Week 2.1)	1 h 31 min
Module 7: Sustainability in Engineering (Week 2.2)	1 h
Module 3 : Engineering Design-2 and 3 (Week 3.1 & 3.2)	1 h 4 min
Module 4 : Platform Based Development 1(Week 4.1)	52 min
Module 5 : Mechanisms 1 (Week 4.2)	1 h 38 min
Module 3 : Engineering design 4 (Week5.1)	53 min
Module 4 : Platform Based Development 2(Week 6.2)	44 min
Module 5 : Motor Sizing Battery Sizing (Week7.1)	
Module 8: Engineering Ethics	1 h 13 min
Course Project	
Animatronics Using Arduino	

Instructor




Madhu Asundi
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Shivprasad Channangi
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Jyoti Gadad
jyothi@kletech.ac.in



Unnati K
unnati.koppikar@kletech.ac.in

Figure 9: Course Page- Engineering Exploration

Course Code: 15ECRP101 Course Title: Engineering Exploration

L-T-P : 0-0-3 Credits: 3 Contact Hours: 72 ISA Marks: 100

Content	Hrs
Module 1: Introduction to Engineering and Engineering Study Introduction to Engineering and Engineering Study; Difference between science and engineering, scientist and engineer needs and wants, various disciplines of engineering, some misconceptions of engineering, Expectation for the 21st century engineer and Graduate Attributes.	3 Hrs
Module 2: Engineering Design Engineering Design Process, Problem definition formulation process, Concept generation-Function tree, Functional structure, Morphological chart, and Concept selection- Pugh Chart, Product Architecture, Prototyping and testing	09Hrs
Module 3: Mechanisms Basic Components of a Mechanism, Degrees of Freedom or Mobility of a Mechanism, 4 Bar Chain, Crank Rocker Mechanism, Slider Crank Mechanism. Simple Robotic Arm building. Motor and battery sizing concepts.	9 Hrs
Module 4: Platform based development Introduction to various platform based development (Arduino) programming and its essentials, Introduction to sensors, transducers and actuators and its interfacing with Arduino.	18Hrs
Module 5. Project Management Introduction to Project Management, Significance of team work, Significance of Agile practices, Significance of documentation.	06Hrs
Module 6. Engineering Ethics Identifying Engineering as a Profession, Significance of Professional Ethics, Code of Conduct for Engineers, Identifying Ethical Dilemmas in different tasks of engineering, Applying Moral Theories and codes of conduct for resolution of Ethical Dilemmas	3 Hrs
Module 7. Sustainability in Engineering Introduction to sustainability, Sustainability leadership, Life cycle assessment, carbon foot print	06 Hrs
Course Project	21 Hrs
Reviews	

Figure 10: Lesson Plan –Engineering Exploration













Module 3 : Engineering Design (Week 2.1)	1 h 31 min														
Module 7: Sustainability in Engineering (Week 2.2)	1 h														
Pre Session In Session Post Session															
<table border="1"> <tr> <td> Global Challenges</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td> Introduction to Sustainable Development</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td> History of Sustainable Development</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td> Role of Engineers and Sustainable Leadership Matrix</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td> Example : Hashbro Toothtunes</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td> Example : Woobamboo Toothbrush</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td> Life Cycle Analysis</td> <td><input checked="" type="checkbox"/></td> </tr> </table>		 Global Challenges	<input checked="" type="checkbox"/>	 Introduction to Sustainable Development	<input checked="" type="checkbox"/>	 History of Sustainable Development	<input checked="" type="checkbox"/>	 Role of Engineers and Sustainable Leadership Matrix	<input checked="" type="checkbox"/>	 Example : Hashbro Toothtunes	<input checked="" type="checkbox"/>	 Example : Woobamboo Toothbrush	<input checked="" type="checkbox"/>	 Life Cycle Analysis	<input checked="" type="checkbox"/>
 Global Challenges	<input checked="" type="checkbox"/>														
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 Example : Hashbro Toothtunes	<input checked="" type="checkbox"/>														
 Example : Woobamboo Toothbrush	<input checked="" type="checkbox"/>														
 Life Cycle Analysis	<input checked="" type="checkbox"/>														
Module 3 : Engineering Design-2 and 3 (Week 3.1 & 3.2)	1 h 4 min														
Module 4 : Platform Based Development 1(Week 4.1)	52 min														

Figure 11: Module – sustainability pre-session all videos and contents







Module 7: Sustainability in Engineering (Week 2.2)	1 h				
Pre Session In Session Post Session					
<table border="1"> <tr> <td> Carbon Footprint Calculations 1 h</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td> Carbon Footprint Homework</td> <td><input checked="" type="checkbox"/></td> </tr> </table>		 Carbon Footprint Calculations 1 h	<input checked="" type="checkbox"/>	 Carbon Footprint Homework	<input checked="" type="checkbox"/>
 Carbon Footprint Calculations 1 h	<input checked="" type="checkbox"/>				
 Carbon Footprint Homework	<input checked="" type="checkbox"/>				
Module 3 : Engineering Design-2 and 3 (Week 3.1 & 3.2)	1 h 4 min				
Module 4 : Platform Based Development 1(Week 4.1)	52 min				

Figure 12: Module – sustainability In-session carbon footprint calculation and homework resources



Lesson Plan	
Module 1: Introduction to Engineering (Week 1.1)	1 h 29 min
Module 2: Project Management (Week 1.2)	1 h 2 min
Module 3 : Engineering Design (Week 2.1)	1 h 31 min
Module 7: Sustainability in Engineering (Week 2.2)	1 h
Pre Session In Session Post Session	
<div style="border: 1px solid #ccc; padding: 5px;"> <div style="display: flex; justify-content: space-between; align-items: center;">  Assessment 1 : Analyze the situation based on 3 pillars of SD - Q <input checked="" type="checkbox"/> </div> <hr/> <div style="display: flex; justify-content: space-between; align-items: center;">  Assessment 2 : Carbon footprint calculations - Q <input checked="" type="checkbox"/> </div> </div>	
Module 3 : Engineering Design-2 and 3 (Week 3.1 & 3.2)	1 h 4 min

Figure 13: Module - sustainability post-session discussion forum activities

2. Conduct formative assessment to gauge student learning using post-test



























ISA-1 (Week4)			
Chapter 3: Stresses in Beams (Week5)			2 h 11 min
	Pre Session	In Session	Post Session
	15EMEF201_Ch3_W5c1_Part1_Bending stress	7 min	<input checked="" type="checkbox"/>
	FAQ's related to Part1_Bending stress		<input checked="" type="checkbox"/>
	15EMEF201_Ch3_W5c1_Part2_Bending stress	11 min	<input checked="" type="checkbox"/>
	FAQ's Bending stress		<input checked="" type="checkbox"/>
	15EMEF201_Ch3_W5c1_Part3_Bending stress	7 min	<input checked="" type="checkbox"/>
	FAQ's about Bending stress		<input checked="" type="checkbox"/>
	15EMEF201_Ch3_W5c1_Part4_Bending stress	12 min	<input checked="" type="checkbox"/>
	FAQ's about Bending stress		<input checked="" type="checkbox"/>
	15EMEF201_Ch3_W5c2_Problem on bending	15 min	<input checked="" type="checkbox"/>
	FAQ's about Bending stress		<input checked="" type="checkbox"/>
	15EMEF201_Ch3_W5c3_Problem on bending stress	12 min	<input checked="" type="checkbox"/>
	FAQ's about Bending stress		<input checked="" type="checkbox"/>
	15EMEF201_Ch3_W5c4_Part1_Shear stress in a beam	6 min	<input checked="" type="checkbox"/>
	FAQ's about shear stress in a beam		<input checked="" type="checkbox"/>
	15EMEF201_Ch3_W5c4_Part2_Shear stress in a beam	15 min	<input checked="" type="checkbox"/>
	FAQ's about shear stress formulae		<input checked="" type="checkbox"/>
	15EMEF201_Ch3_W5c5_Variation of shear stress	10 min	<input checked="" type="checkbox"/>
	FAQ's about variation of shear stress		<input checked="" type="checkbox"/>
	15EMEF201_Ch3_W5c6_Problem on shear stress	12 min	<input checked="" type="checkbox"/>
	FAQ's about shear stress in rectangular cross section		<input checked="" type="checkbox"/>
	15EMEF201_Ch3_W5c7_Part1_Shear stress in I-section	11 min	<input checked="" type="checkbox"/>
	FAQ's on shear stress in I-section		<input checked="" type="checkbox"/>
	15EMEF201_Ch3_W5c7_Part2_Shear stress in I-section	13 min	<input checked="" type="checkbox"/>
	FAQ's about shear stress in a beam		<input checked="" type="checkbox"/>
	Discussion group on Chapter 3		<input type="checkbox"/>
	Post test -4		<input checked="" type="checkbox"/>
Chapter 4: Torsion and Buckling (Week6)			2 h 12 min

Figure 14: Post-test After Asynchronous delivery

Question 9
Incorrect
Mark 0.00 out of 1.00
[Flag question](#)

In a beam of I-section, the maximum shear stress is carried by the

- a. Lower flange
- b. Upper flange ✘
- c. Web
- d. Intersection of upper flange with web

Your answer is incorrect.
The correct answer is:
Web

Question 10
Correct
Mark 1.00 out of 1.00
[Flag question](#)

A cantilever beam with a clock-wise couple (external moment) at the free end results in ____ shear force.

- a. None of these
- b. Zero ✔
- c. Negative
- d. Positive

Your answer is correct.
The correct answer is:
Zero

[Finish review](#)

[◀ Discussion group on Chapter 3](#)

Jump to... ▾

Synchronous Class Recording
27/10/2020 ▶

Quiz navigation

1	2	3	4	5	6	7	8	9	10

[Show one page at a time](#)

[Finish review](#)

Figure 15: Conduction of post-test – Sample Questions which students have attempted

C. CHECK

1. To monitor student's engagement with the online learning resources

First name / Surname	Email address	fg	Syllabus	Course Assessment Plan	Module 1: Introduction to ...	Module 2: Project Management	Module 3: Engineering Design	Module 4: Platform Based ...	Module 5: Mechanisms	Module 6: Engineering Ethics	Module 7: Sustainability in...	Introduction to Engineering...	Video on Course projects	Introduction to Engineering	20th Century Engineering ...	Difference between Science ...	What is engineering?	Why study engineering?	What kind of problems ...	Sustainable Development Goals	21st Century grand ...	Graduate attributes	Honor Code	Assignment 1: Engineering ...	Discussion Forum Activity -H
Kailash Angadi	01FE20BCS162@kletech.ac.in	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
KUSHAL KOKATNUR	01FE20BEC039@kletech.ac.in	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
KISHORKUMAR	01fe20bcs234@kletech.ac.in	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Figure15: Activity log Report-Engineering Exploration course

2. Live in synchronous sessions in MS Teams

The attendance of students in synchronous sessions was taken and added to a student management system as shown in figure 16.

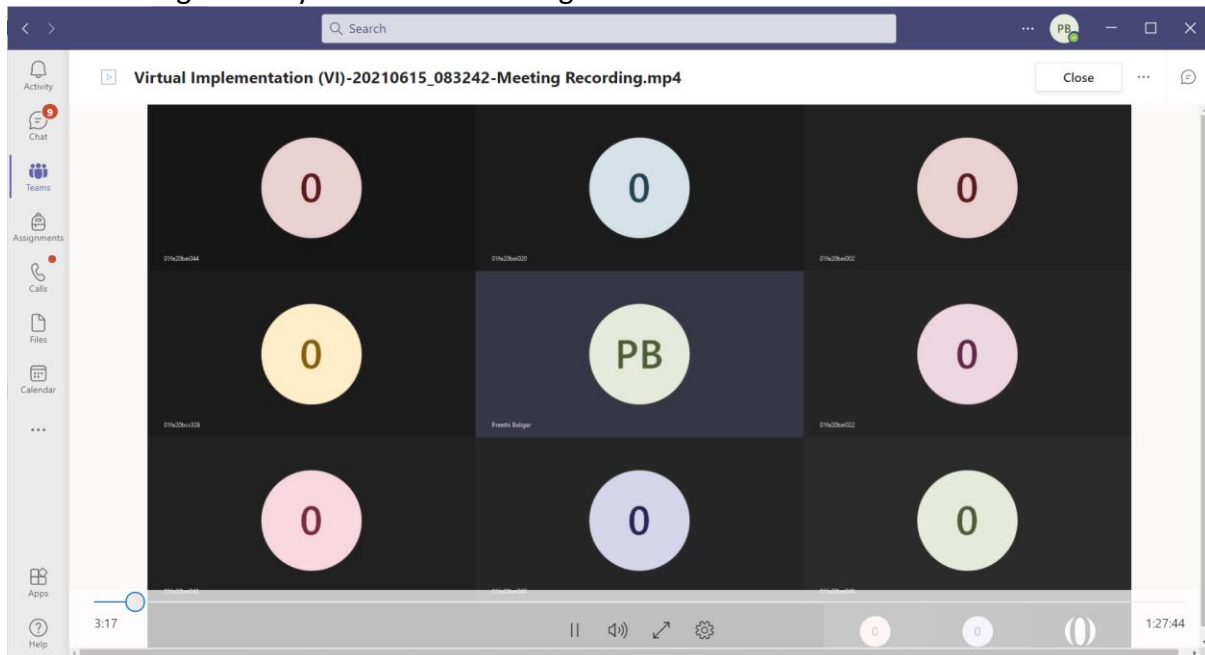


Figure 16: Snapshot of attendance of synchronous session

3. To monitor the performance of students in assessments

15EMEF201_2020-2021	
Participants	
Badges	
Competencies	
Grades	
LESSON PLAN	
Chapter 1: Stress and Strain (Week1)	
Chapter 1: Stress and Strain (Week2)	
Chapter 2: Shear Force and Bending Moment Diagrams (Week3)	
ISA-1 (Week4)	
Chapter 3: Stresses in Beams (Week5)	
Chapter 4: Torsion and Buckling (Week6)	
Chapter 5: Compound stresses (Week7)	
ISA-2 (Week8)	
Chapter 6: Deflections of Beams (Week9)	
Chapter 7: Thin and thick cylinders (Week9)	
Post Test 8 & 9 (On 24/11/2020)	
All videos review	
Dashboard	
Calendar	
Private files	
Content bank	
Site administration	

First name / Surname	ar stress ...	Post test -4	HEP
Aravind D .	-Q	5.00Q	
Basavaraj .	-Q	-Q	
Doddabasappa .	-Q	-Q	
Goutam .	-Q	7.00Q	
Jawad Khan .	-Q	-Q	
Manjunatha T .	-Q	8.00Q	
P Bharat .	-Q	2.00Q	
Pavan K .	-Q	6.00Q	
Pradeep .	-Q	8.00Q	
Prakash V .	-Q	4.00Q	
Prakhyath .	-Q	-Q	
Rohan G .	-Q	3.00Q	
Sharanbasappa .	-Q	7.00Q	
Shrihari N .	-Q	-Q	
Srinidhi .	-Q	6.00Q	
Yamanur .	-Q	-Q	
Shakainah P Achary	-Q	9.00Q	
Mohammad Adnaan	-Q	9.00Q	
Annappa N Agasar	-Q	3.00Q	
Danish Ahamed Khan	-Q	7.00Q	
Aakash V Alagawadi	-Q	-Q	
Aakash V Alagawadi	-Q	-Q	
Adarsh R Angadi	-Q	5.00Q	
Harsh Shivanand Angadi	-Q	-Q	
Siddhant S Angadi	-Q	3.00Q	
Shetty Aniruddh	-Q	6.00Q	
Abhishek Arakeri	-Q	8.00Q	
Sudeep P Aralikatti	-Q	-Q	
Overall average	6.09	10.00	

Figure 17: Mechanical of Material Post-test scores in Gradebook

- To monitor the availability and usage of Learning management system
 Department level LMS SPOCs monitor the availability if the resources every week.

Activity logs are referred (Figure 15) to check the usage of the LMS.

D. ACT

1. To enrich online learning resources by a feed-back mechanism
 - One of the assessment chosen was post-test, which was conducted to assess if the students had met their learning goals. But in the first level of implementation the post-test questions were based on the content that was delivered through the pre-recorded videos and not the concepts. At this juncture, there was a gap identified that faculty couldn't derive any inferences on concepts that were not clear to the students as the questions framed were based on the content of the video rather than the concepts. So it's the time to redesigned post-test model to create concept-wise questions to conduct the post-test effectively and to carry out a quantitative analysis based on the post test results collected using a tool called Dipstick integrated with the LMS.
 - Along with this discussion forum can be used effectively to collect the feedback for each of the activity.
 - FAQs can be created based on the feedback given by the students on the online learning resources.

2. To improve student engagement with content -

To ensure student engagement while they are watching videos, attention quizzes were added at logical points in the video. However, these questions were not assessed. Hence student engagement with content could not be ascertained. In the next implementation of the LMS, it is proposed to grade the attention quizzes as well.

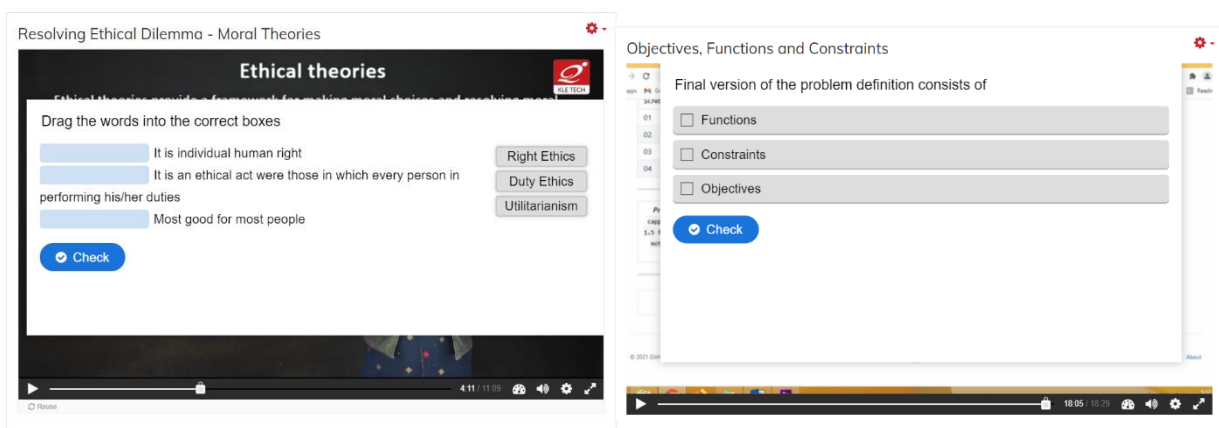


Figure18: Snapshots of interactive content in Engineering Exploration