E-CONTENT DESIGN BASED ON OUTCOME BASED LEARNING

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Challenges in 21st Century Education

- How to improve Student Engagement
- How to equip students with the 21st century knowledge, skills and attitudes?
- How to allow continuous improvement in curricula, incorporation of better Open Educational Resource, for more effective teaching.
- How to Ensure examination system reinforces teaching and learning
- How to ensure life long learning
- How to *teach a large class*


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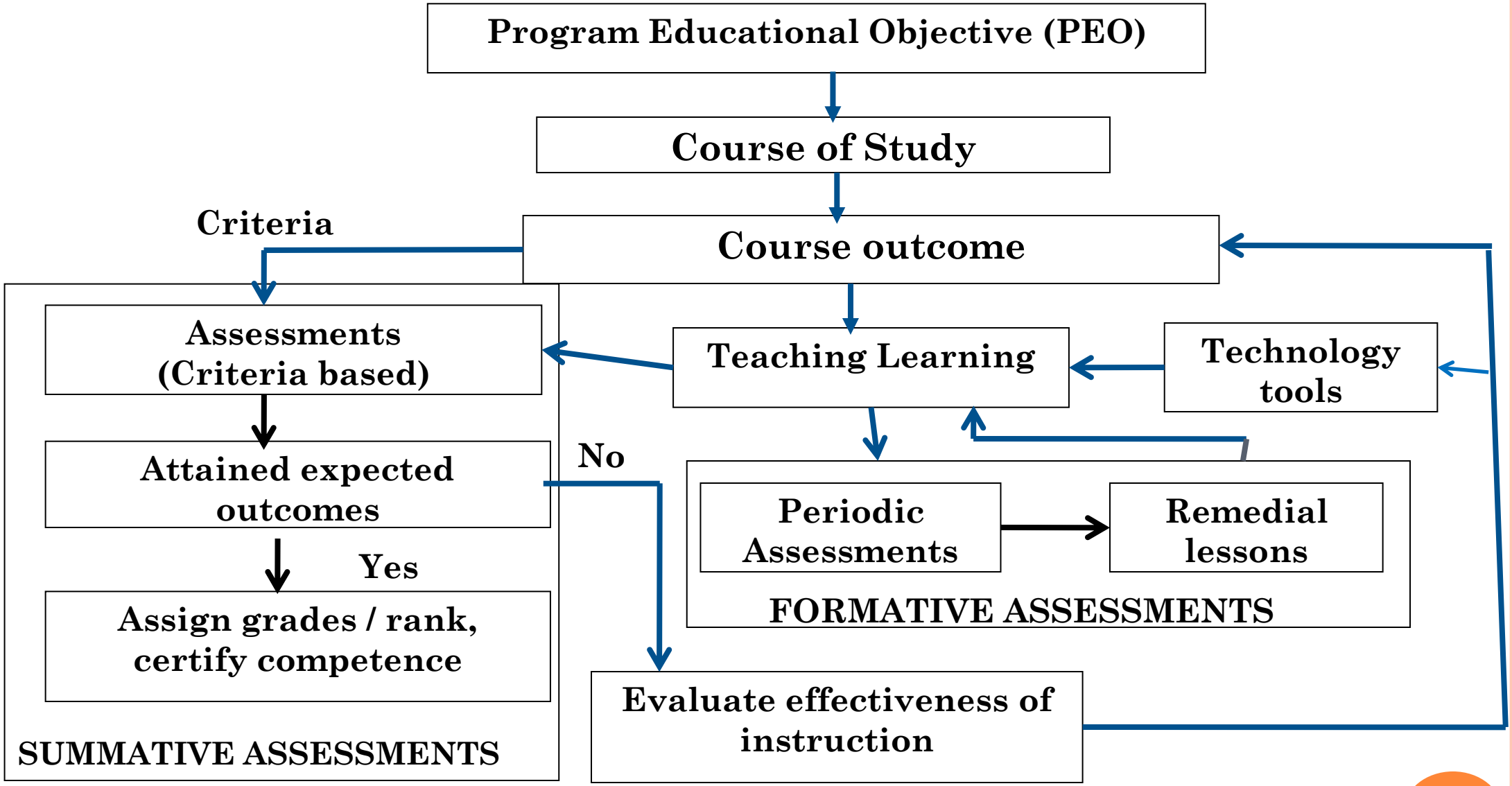
Impact of examination system on teaching and learning



E-content development objective

- **Improve student engagement by promoting self learning so that within limits, learners are allowed to follow their own pace, learning styles**

- **To equip student with 21st century attitude and skills. Learning to learn, communication skills, working in groups are to be important learning outcomes in addition to domain specific knowledge.**

- **Learning recourses should support different learning style and learning approaches.**

- **Include adequate number of nontrivial practice problems, assignments etc. matching with every learning outcome to allow students to test their learning success.**

- **Continuous improvement in curricula by incorporating better educational resources from industry and domain experts.**

Outcome based Learning

Alice in the wonderland

Role of a Teacher is to guide and mentor students

IT'S NOT WHAT Teacher TEACHS,
IT'S WHAT Learners LEARN

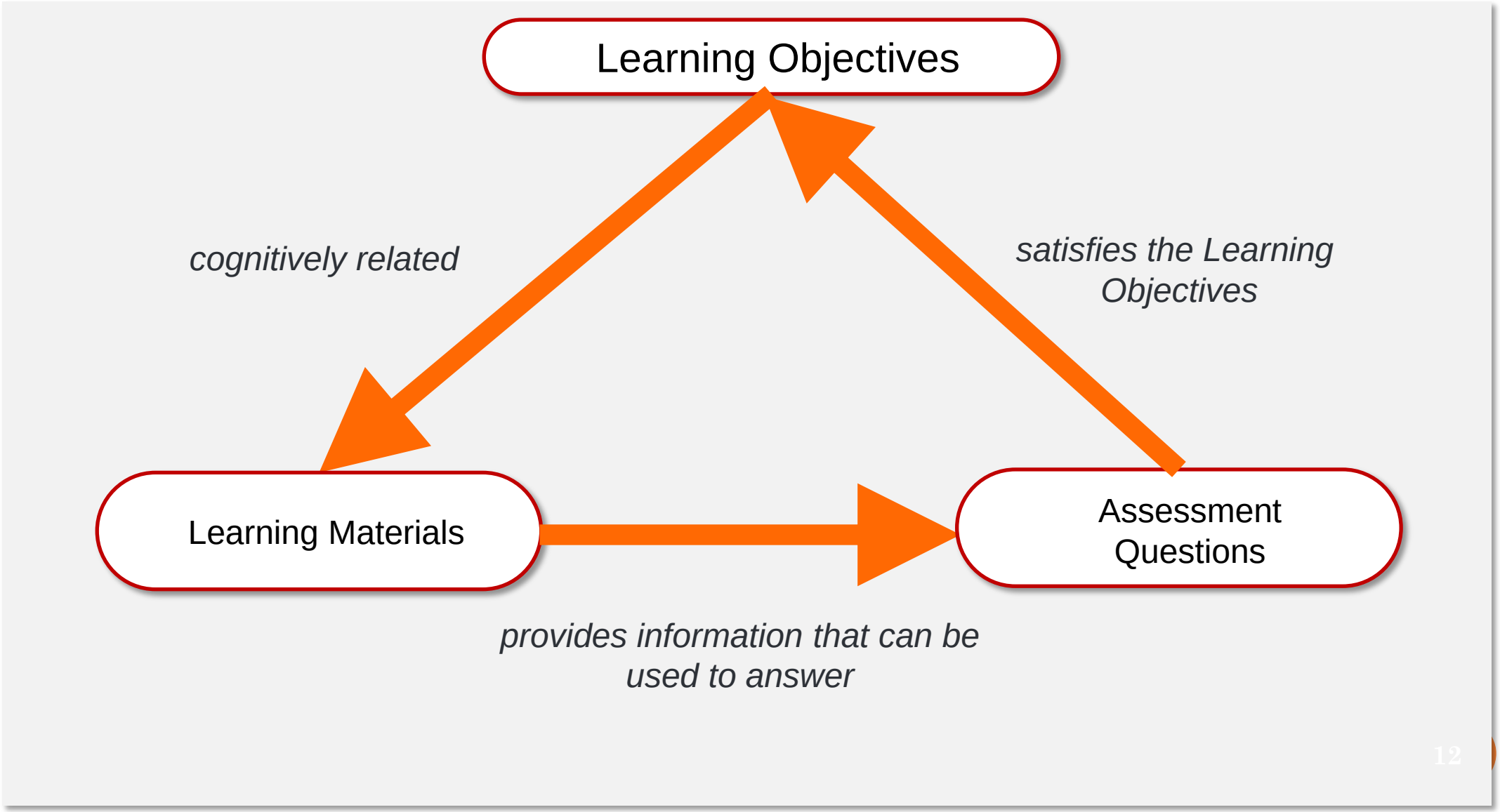
Role of a Teacher is to guide and mentor students

→ learner-centric approach

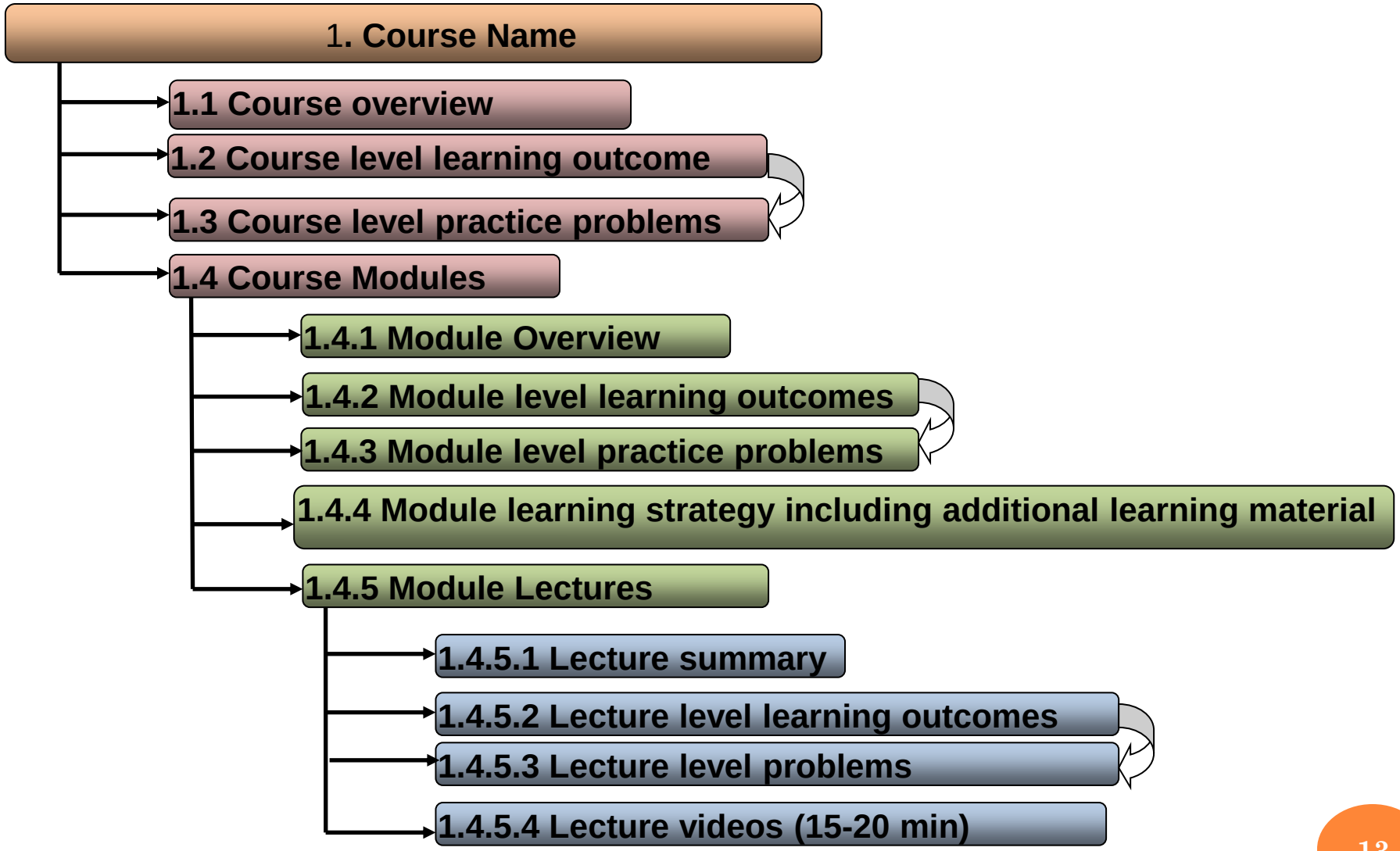
OBE addresses the following key questions:

- **What** do you want the students to be able to do? **(skillset)**
- **How** can you best help students achieve it? **(Guide)**
- **How** will you know what they have achieved? **(Evaluation)**
- **How** do you close the loop **(How Evaluation system reinforces the teaching and learning)**

E-content generation framework


Learning Objectives
cognitively related
satisfies the Learning Objectives
Learning Materials
Assessment Questions
provides information that can be used to answer

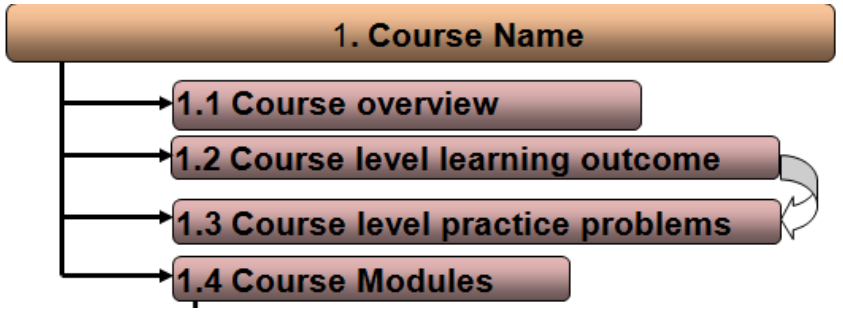
E-content generation framework



Course: Identify the area or topic with appropriate name and develop the above structure of the course.

Table-1 Tentative time duration

Course duration	Learners' learning time	Numbers of course outcome	Module duration
4-5 week	15-20 hours	2-3	1 week
10-14 week	30-40 hours	5-6	2-3 weeks



1.1 Course overview: One paragraph write-up on course coverage and one paragraph write-up on how this course fits into the learner requirement (with real life example).

1.2 Course level learning outcome: Course outcome are major domain specific outcomes based on Instructional System Design (ISD) principles which are specific, measurable and can be demonstrated by learner on completion of the course.

1.3 Course level practice problems:

Practice problems/case studies related to course outcome

1.4 Course Modules:

Each course should be divided into appropriate number of modules

OUTCOME

A statement of something which is **SPECIFIC, MEASURABLE, ACHIEVABLE** that students should be able to **DO** after receiving instruction if it

Three Important features of a well-written Instructional Objective:

A. The performance component
B. The condition component
C. The criterion component

Course outcome

Course Name: Room Acoustic

I. Given the specification of an acoustic room (large room or small room acoustic) **determine** the reverberation time, mean free path, number of reflection per second, room modes and minimum volume for large room acoustic .

II. Given the specification for a auditorium or studio requirement **list** the acoustical requirements and **design** the acoustic part of the auditorium or studio.

III. **Determine** the sound reflection, transmission, absorption, coefficients for a given acoustic source and condition.

The student will be able to design the armature winding of a D.C.Machine of prescribed specification by understanding the basic terminology used for it

Use numerical methods for solve 1st order and 2nd order ordinary differential equation and compute numerical integration.

Given the specification of an acoustic room (large room or small room acoustic) **determine** the reverberation time, mean free path, number of reflection per second, room modes and minimum volume for large room acoustic

Cognitive level of the outcome

Synthesis: Given the specification for a auditorium or studio requirement **list** the acoustical requirements and **design** the acoustic part of the auditorium or studio.

Analysis: Determine the sound reflection, transmission, absorption, coefficients for a given acoustic source and condition.

Given an English language problem description, define the problem precisely with input/output requirements, examine its inherent complexity and develop a generic or set of initial solutions (which can be explored for various design options) and justify their correctness

Describe the fundamental concepts of Software Quality Management.

Discuss the basic concepts of Coding, the guidelines to be followed during coding of a software and the coding standards.

Incorrect Cognitive level

Application: Apply basic laws of EM waves like gauss law and Biot Savart's law to different charge configurations like line chage, surface charge and volume charge

Application: Apply abstraction mechanism to identify meta data elements

Outcome are Not learner centric

To provide students necessary background to analyze language processors.

Apply the basic concepts of electronics

To understand and to identify and use SQL to query, update, and manage a database

Able to understand and describe features of internet, WWW and Semantic web.

Able to demonstrate the skills of developing semantic web applications, using RDF, RDFS, OWL and tools.

Appraise the Micro-controller architecture

Outcomes are measurable but not achievable with in the course.

Induction Motor Operate

Conceive real time projects to apply the concepts of data mining.

Evaluate the circuits

Student able to Solve differential equation

Students will be able to analyze the various approaches to implement the digital system to arrive at the most suitable approach

Create hardware modelling and the design flow

Outcomes are measurable but not Specific

Compute different parameters like surface potential related to EM Wave problems using Numerical methods

Outline of Power Electronics, recognize its advantages and disadvantages over conventional system. Classify various Power Semiconductor switches like power diode, power MOSFET, IGBT, UJT, SCR, GTO, TRIAC, DIAC. Study their operation. Design the firing circuits. Choose appropriate switches for various application

To introduce about optimum design and use optimization methods to design mechanical components

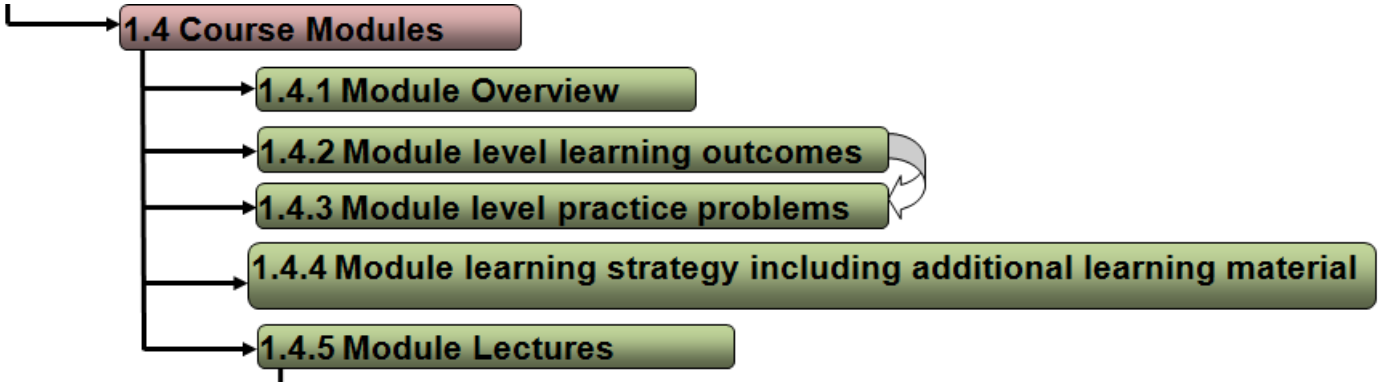
Describe the fundamental concepts of Software Quality Management.

Outcome: Determine the sound reflection, transmission, absorption, coefficients for a given acoustic source and condition.

Plane wave in water of ***100 Pa*** effective (rms) pressure are incident normally on a sand bottom. The sand bottom is characterized by ρ_2***=2000kg/m³***and c_2***=1600m/s***. ***where speed of sound in water*** c_1***= 1450 m/s*** and density ρ_1***=1000kg/ m³***

(a) Calculate the effective pressure of the wave reflected back into water and the effective pressure of the wave transmitted into sand

(b) Determine the smallest angle of incidence at which all the incident energy will be reflected back.



1.4.1 Module Overview: One paragraph write-up on module coverage and one paragraph write-up on how this module fits into the course

1.4.2 Module level learning outcomes: outcome should specify the major skill/concepts learners need to achieve for that module.

1.4.3 Module level practice problems: Practice problems/case studies related to Module outcome.

1.4.4 Module learning strategy including additional learning material: For every module, a self study guide is to be prepared.

1.4.5 Module Lectures: Each module divided into appropriate number of lecture.

Example

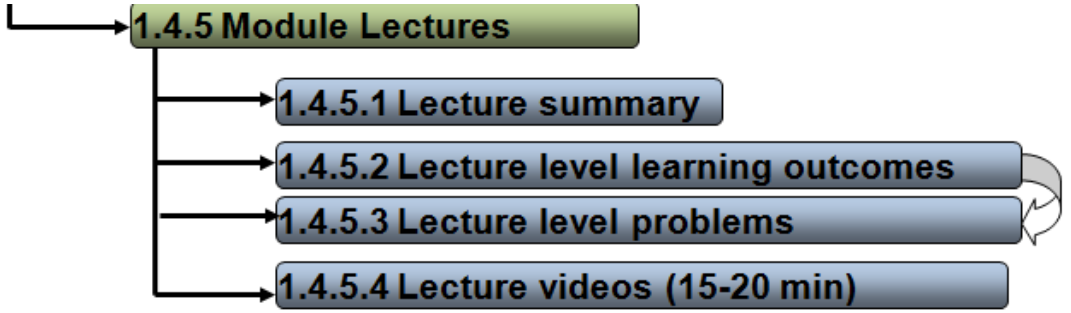
Module Name: Acoustic Wave Equation

Module level learning outcomes

I. Derive the Linear Wave Equation and Spherical Waves
II. For a given specification of acoustic Waves propagation determine the intensity of the acoustic Waves at a particular distance.
III. Calculate the sound pressure level (SPL) and intensity in dB for a given acoustic source and necessary specification

Module level practice problems

1. The sound source produces 60 dB power and the sound is propagated as a spherical wave. What is the sound intensity for a person hearing it from *50 m* away?→ **outcomes-II**



1.4.5.1 Lecture summary: There will be a short (around 2 pages) summary for every lecture.

1.4.5.2 Lecture level learning outcomes: Outcome should specify the major skill/concepts learners need to achieve after the lecture.

1.4.5.3 Lecture level problems: Practice problems/case studies related to lecture outcome.

Example

Lecture level learning outcomes

Derive the mathematical expression for **Acoustic Impedance** for spherical wave propagation

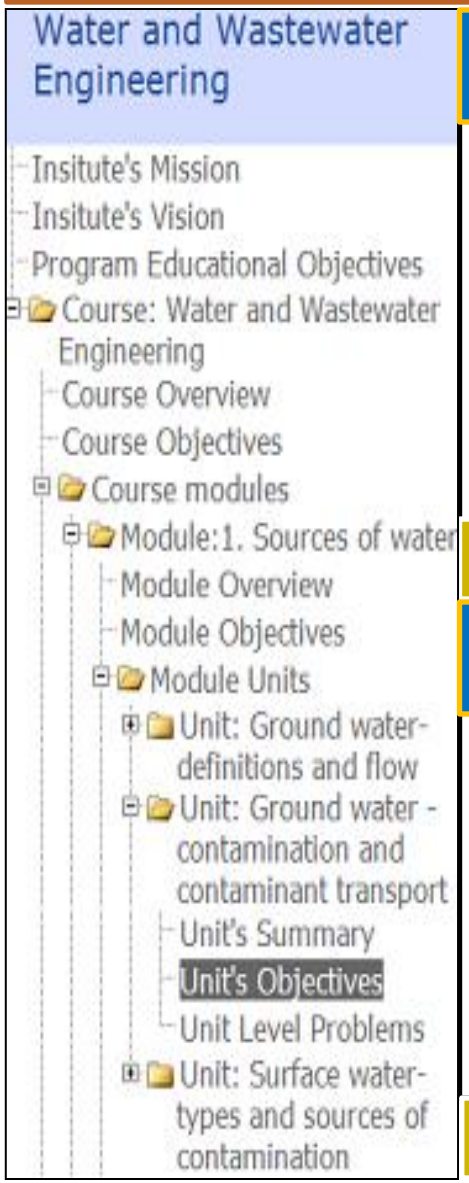
Lecture level problems

Given a small source of spherical wave in air at a radial distance of ***100 cm***, compute the absolute magnitude of the specific acoustic impedance for ***500Hz*** frequency at this location. Then density of air $\rho_0 = 1.21\ kg/m^3$ and velocity of sound in air $c = 340m/s$.

Course Name: Water and Wastewater Engineering

Develop by:

Click for detail



Water and Wastewater Engineering -> Module 1. Sources of water -> Unit Ground water - contamination and contaminant transport: **Objective**	Water and Wastewater Engineering -> Module 1. Sources of water -> Unit Ground water - contamination and contaminant transport: **Learning resources**
Ob1: Knowledge:-Identify potential sources of contamination. Ob2: Analysis:-Determine velocities of various contaminants in ground water.	In this unit, the student should understand the nature of contamination of GW and how it differs from SW contamination. Effects of dispersion and diffusion on the transport of contaminants should be clear. **Learning material** ▪**NPTEL Lecture2** ▪**www.ref.org** ▪**Book ……chapter-2: page3 -6** ▪**www…vlab**
Add comment	**Add Simulation** **Add Learning Resources**
Water and Wastewater Engineering -> Module 1. Sources of water -> Unit Ground water - contamination and contaminant transport: **Take note**	Water and Wastewater Engineering -> Module 1. Sources of water -> Unit Ground water - contamination and contaminant transport: **Test Item**
	1. List all possible uses of water and classify as consumptive or non-consumptive. 2. List all possible domestic uses of water and classify as consumptive and non-consumptive. 3. Prepare a piechart showing the relative distribution of different domestic uses. 4 An underdeveloped village with the same population (greater than 11,000) versus the planned community mentioned in the above problem will have different water needs. What is the difference in requirement and why? **Are you able to answer the above test item** **Y/N**
FAQ **Ask Question** **Form Groups**	**Add New Test Item** **Add case studies** **Add Project**

Stay Home Stay Safe

Thank You