Self Paced Courses for Newbies

Proposed Features of Learning Sessions

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1 General New Features

Every course will be divided into several modules.
Each module will consist of one or more learning sessions.
Each learning session is divided into several subsessions.

Every subsessions will involve learning, problem solving and assessment. Estimated time required for each session is about 10-20 minutes.

A subsession may also involve other activities such as,

- watching short videos [5 -10 mins]
- doing a Google search
- fishing for questions and answers from internet.
- submitting Google/Web Forms for short answers to conceptual questions
- Ranking available short sample answers to conceptual questions.

A major departure from standard lecture notes/ study material is as follows.

A session of self learning / teaching a topic, (say bound states in one dimension) is planned as consisting of several parts. The parts will for now come in at two types; (more types may in future)

2 Subsession Type -I Let's Just Talk

This type of parts of a session will have some /all of the following features.

- It will have as few equations as possible.
- The learner will be encouraged to think, explore and answer conceptual questions. The details will of course depend on the mode of learning and teaching — regular class room; live online sessions; — offline self study etc.

- Active participation by the learner is encouraged by asking him/her to
  - do internet searches
  - submit web forms
  - to rank available short sample answers
  - look at the best available answers to a given set of questions.

An effort will be made to provide an audio recording with subtitles and a pdf file of full transcript. This will facilitate a different kind of experience and may be preferred by some of the users.

3 Subsession Type-II Tighten your seat belts and do your maths right

This will be like a regular lectures with very little digression; Keep the learner focused on mathematical details. Make it as precise as possible.

It is planned to provide the content of Type-II sessions as video recording of black board talks. There will be pauses/breaks during which the learner will be encouraged to complete derivations of selected mathematical steps.

4 Features to be incorporated

- Establish connections with what the learner knows and what is going to come.
- Establish connections with topics in other branches of physics and other subjects where ever possible.
- to provide links to several levels of detailed resources; This will be designed to enable a learner to revise required prerequisites, or even learn from the scratch.
- At every stage an effort will be made to keep the learner informed of (i) what is being done; (ii) how it will be done (iii) where it will be used etc.

5 Module Structure

1. Syllabus
2. Prerequisites

A learning session will consist of subsessions. For example:

1. Type-I Subsessions: Let's Just Talk
2. Type-II Subsessions: Tighten your belts; Do your mathematics right.
3. Type-III Subsessions: Activities
4. Type-IV EndNotes

1 Structure of Type-I Subsessions

1. Objectives
2. Old and New Concepts
3. Talks 1,2,3 ...
   Includes short questions; Web forms; Short examples.
4. Discussions related to short questions, Webforms, and short examples
5. Learn More

2 Structure of Type-II Subsessions

1. Objectives
2. Recall and Discuss
3. Chalk Talks 1,2,3 ...
   Includes quick questions; verify; prove..// Bloom's Taxonomy Levels 1 and 2.
4. Anti Black Boxes, Answers, Solutions
5. References

6 Type-III Subsessions :: Activities

1. Activity outcomes;
2. Activity Tutorial; Exercise; Quiz, Rank; Test ...
   Bloom's Taxonomy Levels 3,4,5
3. Higher Order Problem Solving? Challenge problems.
4. Solutions to problems exercises etc.

7 Type-IV Subsessions :: EndNotes

EndNotes will have one or more of the following parts.

1. Notes and References
2. Summary / Highlights of the session.
3. Where will this be used? Connections with other areas and upcoming modules.
4. Connections with areas of Physics and other subjects where ever possible