**Outcome based Pedagogic Principles for Effective Teaching**
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Indian Institute of Technology Kharagpur
Lecture 05
Approach to Design Outcome based Learning (Cont.)

Ok so let us explain that IIT Kharagpur develops an open source tools or you can use anybody can use these tools to develop that outcome this curriculum . I am not saying that you will our objective is to develop the MBA recommendation for the MBA recommendation, our objective to use these tools for effective teaching by developing outcome based curriculum structures.

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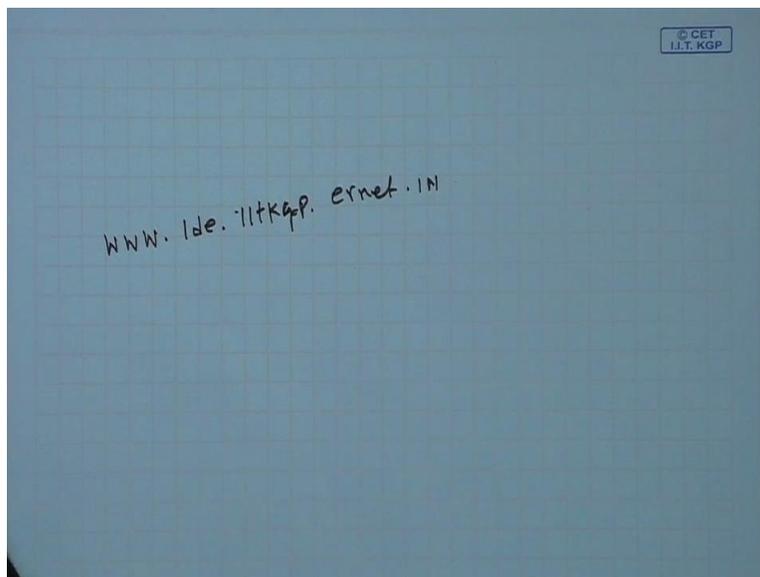
So if you visit www.ide.iitkgp.ernet.in ok.

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So if you see www.iitkgp.ernet.in than this page will appear ok. If this page will appear. Now if you want to develop your own course forget about the MBA guideline of your institute or other things lets develop your own course using this (())(01:32) outcome based phase walk. So that whatever I explain that available to the students and it will increase the student engagement. So this course can be used for your day to day teaching ok.

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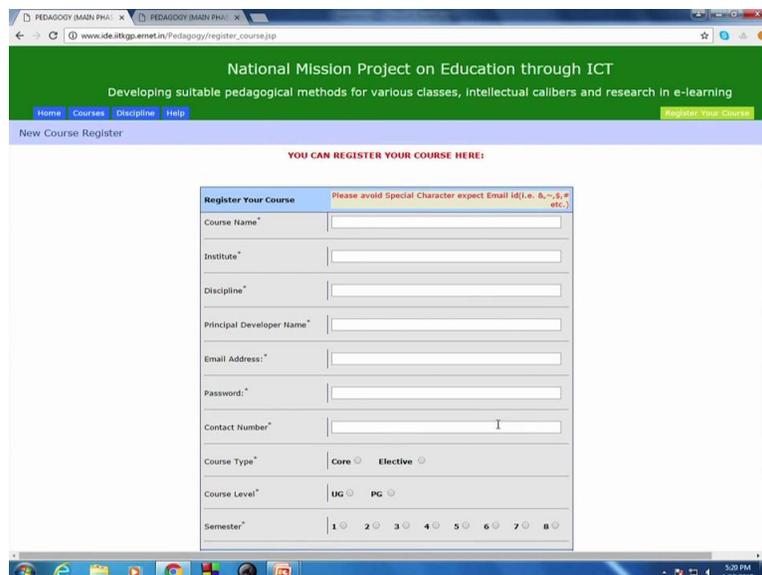
So for that if you click training this page will open up. First you can register your course include your course name, institute name, district name than put your email ID and list password because why password because I say that during the development of your course this course is not visible to anybody. You develop your own space own course from anywhere of the world. Once you develop the course one you confidence that ok this is my course I have taught.

Lets the I will accept the comment from expert in industry than there is a call final submission (())(02:27) once you submit it, it will open to all experts and industry and it will link up with the industry and call them to comment on your course add resources on your course. Your course curriculum will be modified and you will be the you receive all kind of modification machineries ok. So let us concentrate on how to develop the course ok.

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Now once you registered your course will be listed in here, via alphabetical name. Alphabetical name all the courses which is voluntarily develop by the different people of different institute are available in here. I will show you a demo course which is . I have demo course means this is I I registered the blank course to demonstrate what is the structure.

What should be the structure of the development course development ok.

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Let us go to the test, course development page than you are already registered using your email ID and password so you have to provide your that email ID I have register using this email ID. Test at the rate gmail dot com and password 123456 ok.

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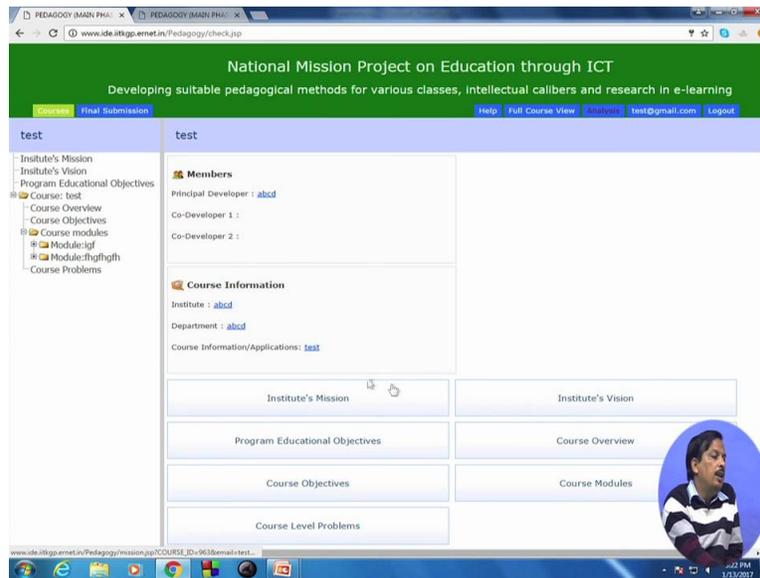
Once I login this structure will be opened to you ok now if you see institute vision institute vision I am not saying when I am developing a single course I do not have to write institute mission and institute vision. My objective is that use this frame work for effective teaching and my product is that once you develop this course this course can be used for your MBA accreditation so there are two uses one is the develop the course structure available to the students so that it can increase the effective teaching and teaching become very easy.

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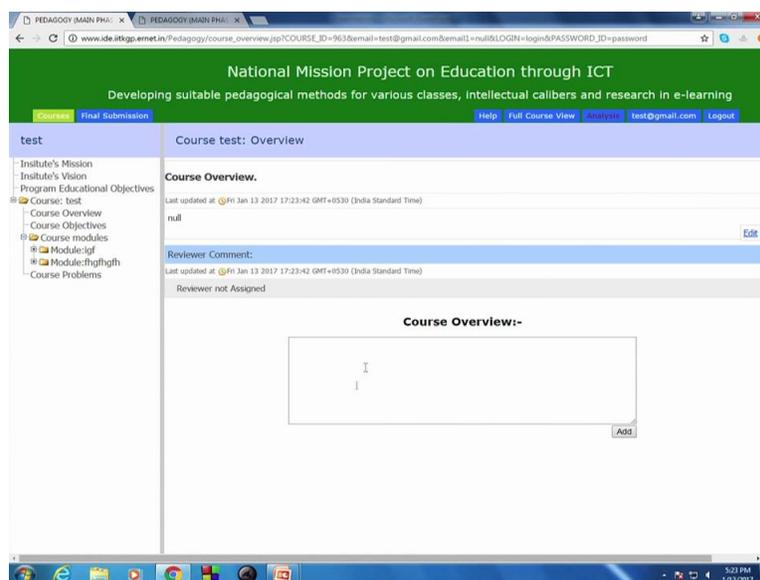
Next it can also by product that MBA accreditation that yes it support the accreditation criteria ok. Now once how do you do, if you say the curse name will become lets I have given the course name test that is why it is come the test then if you open the course click course overview a page will open.

Where I have to write the course overview ok. So what do you mean by course overview here I say course overview is nothing but a one page write up may be first paragraph contain the motivational talk and second paragraph contain the overall coverage of the course.

So two paragraph write up, first paragraph contains the motive why this course is important you say you call and once the students who read that motivational paragraph they will motivated next one is what should be the general broad coverage of the course that is the course overview ok.

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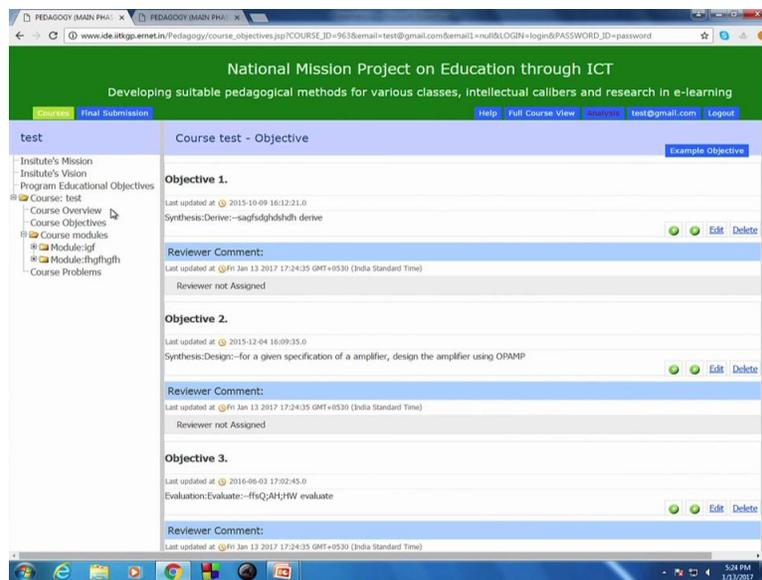
Then you write course objective. Once you click the course objective this this portion will open up this portion will open up. If this portion I am not saying that since the bloom texanomy not here explain I am not going to that bloom texanomy cognitive level. I am just blindly so what is there now you write here the objective. You write the objective here what I said a course objective I have to write 5 to 6 course objective. One objective at a time, one objective at a time write one objective and submit write next objective submit and it will be displayed in upper.

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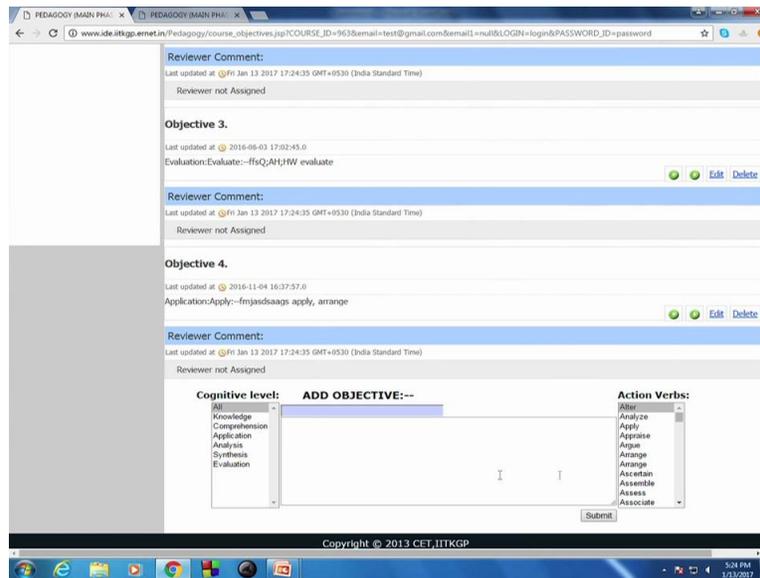
So 5, 4 to 6 course objective which is the major outcome of the course. So here objective means outcome, objective means instructional objective that is why it is course outcome. Course outcome so 4 to 6 major course outcome which is specific which is measurable, which is achievable and each objective try to make that it content the performance component, condition component and criteria component ok and do not use the word different, such as, basic unless those are very define basic is very much concentrated. Do not use those kind of terminology.

Explicitly written down that this will be given this you have to perform up to this level and measure a course objective cannot be knowledge level. You cannot write define this thing as a course objective because I said 5 to 6 course objective and I have 40 lecture so average on an average I can say 8 lecture per objective. So a objective which will be achievable by a single lecture cannot be a course objective. So course objective will be the broad or major take away by this tool and write down one objective at a time.

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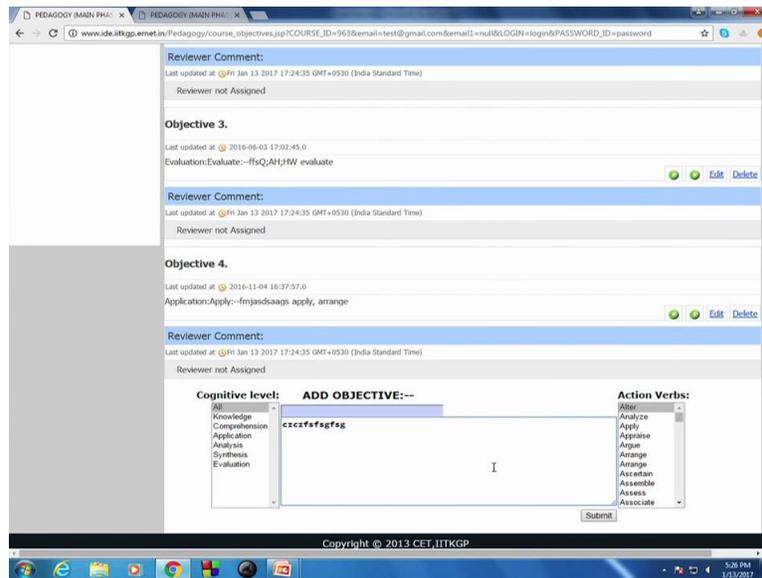
Once you write the objective than you see there is only form. Performance component XL form will be there, so try to use those XL form only because those form are measurable. Here all the a, b, c, d forms are there. Once you say that I have write down a objective which may contain a course objective may contain more than one action verb More than one action verb.

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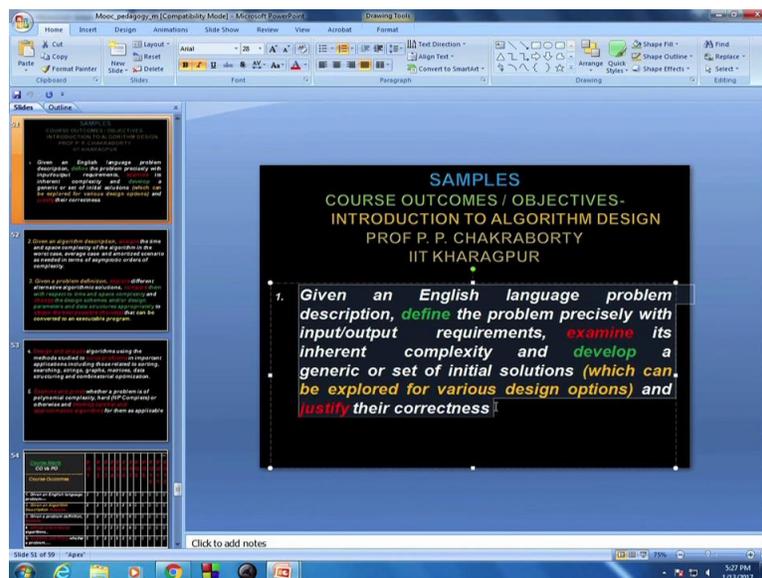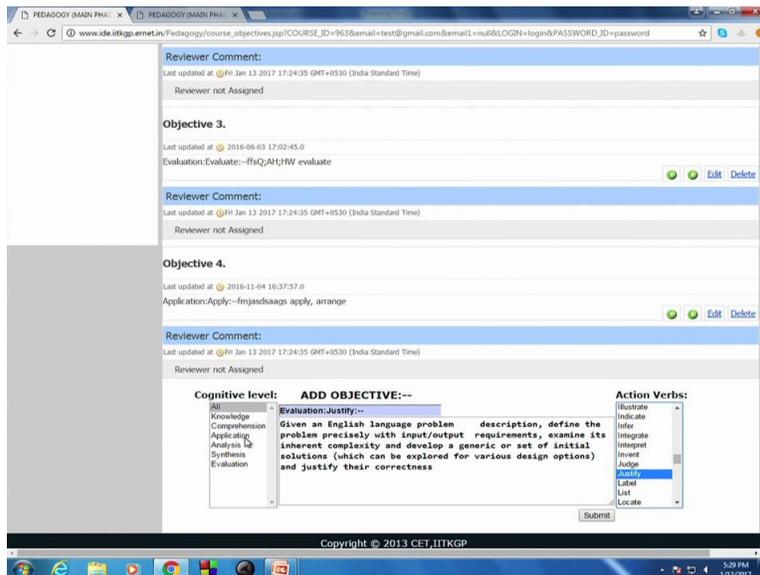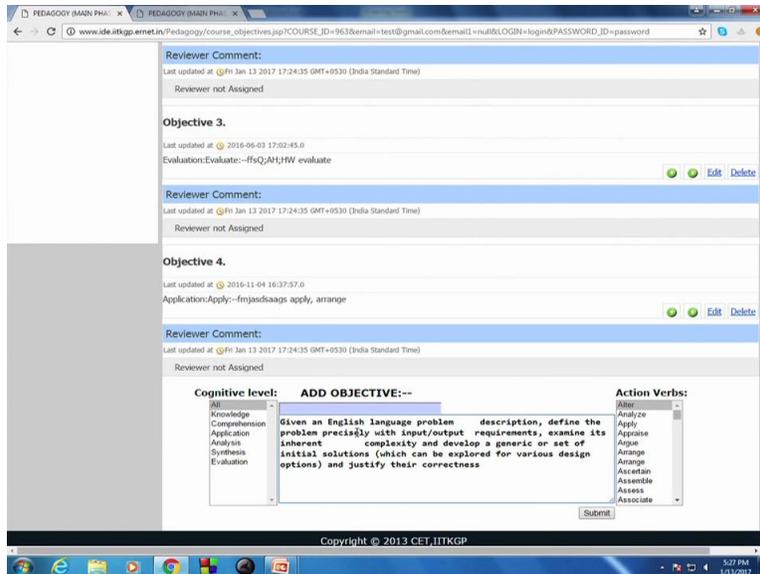
I just give an example lets this is the objective, this objective . written by . our director prof. P. P. Chakraborthy if you see this objective while you come here. So I lets I copy this from here control c. Now if you see the real how many action over define is one action verb, examine is one action verb, develop is another action verb, justify is another action verb ok. Now once you want to submit than you have to select justify because as per the Bloom taxonomy.

Since justify is in evolution level suppose you do not know Bloom taxonomy so you just select one by one and if you select define. Let define the define it says knowledge level then select develop lets develop. This is synthesis level than lets select justify J this is evolution level so if

you see knowledge, comprehension, application analysis, synthesis and evolution. Evolution is the highest level in the Bloom taxonomy so listen the instruction will receive from the . Dr. Tomali Bhattacharya. So track this objective as evolution.

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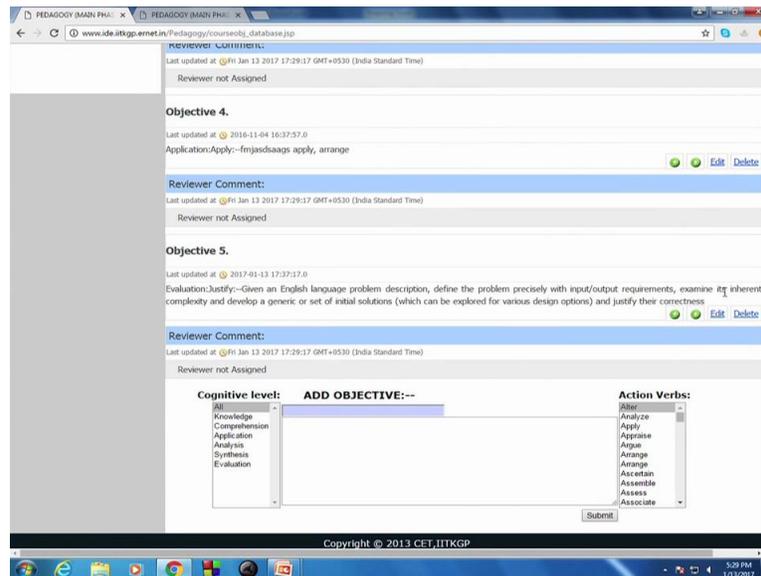
Once you submit objective will come here. If you see this objective has not condition component given an English language problem description condition, performance up to here is the performance. There is no criteria in a component because it does not specify the complexity, he said it should be very known complex open ended problem because this this . this objective is for IITs tools.

They should know much more that is why he said that ok. Now if it is this then I can say this objective is specific measurable and achievable than I write another course objective. So a course objective may content more than one action verb, a course objective may be a few line, a course objective not a single statement it may be a paragraph but it should be explicit, it should be specific, it should be measurable, it should be achievable ok ok.

So one by one you write the course objective ok, now once I said goal is set up objective is given that means goal is set up. How the goal will be achieved by the lectures in different module so a course can be achieved course goal can be achieved by different module.

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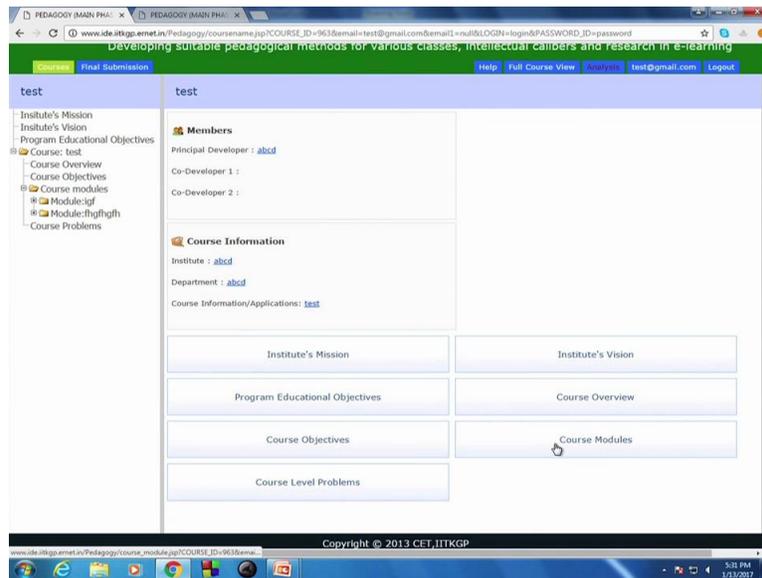
So I will add module if you see course than if you say course module there is a add module. So let us I thought a course on digital communication there will be several module.

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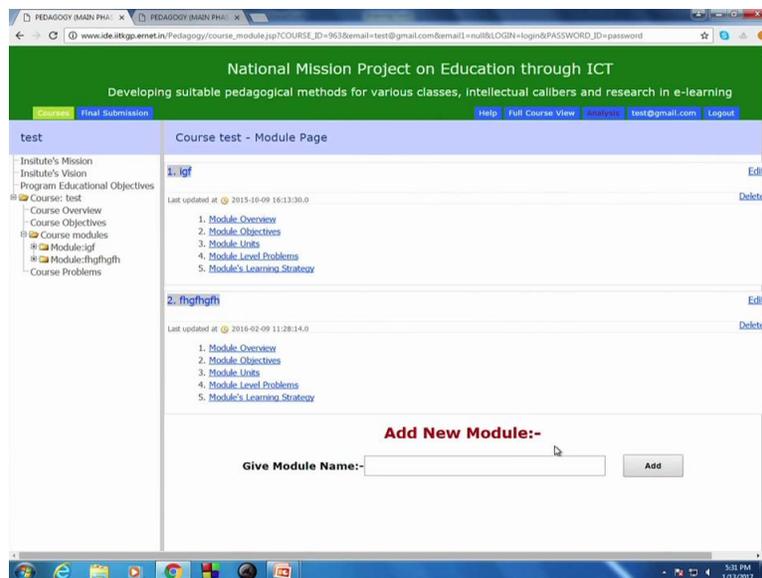
First module may be A to D conversion so I write the name A to D conversion module, once I write the module name and add it module will come like this way. A module has module overview, module objective then the module consists of sudden lectures. Module units means lectures here unit means lectures each lectures is consists of one hour lecture.

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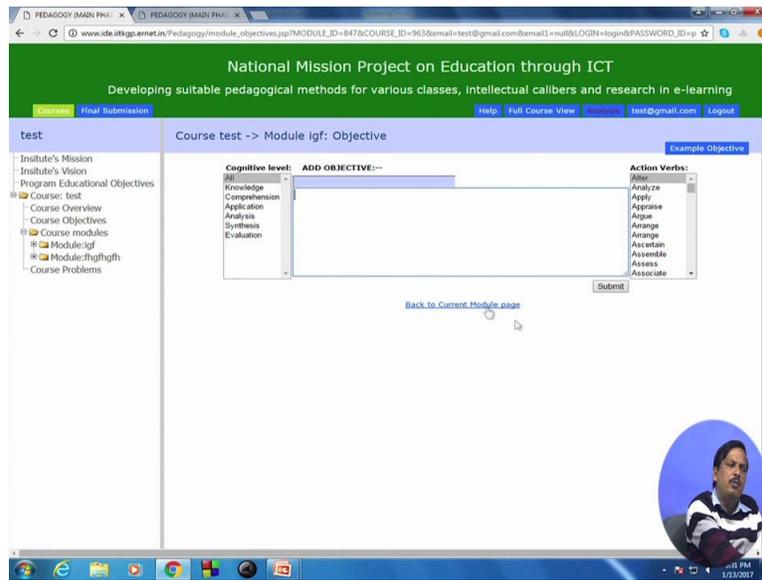
One hour lectures so module overview again same as course overview but it within the module than module objective again I can write the module objective the same way course objective.

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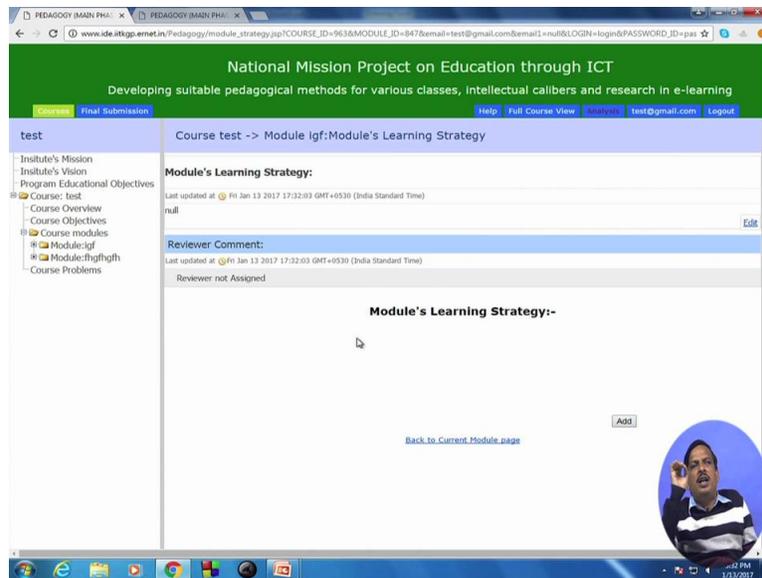
Then there is a module learning strategy here instead of defining the material for every class I said please write that this is the module objective to achieve this module objective more than the unit, unit level class want those are the those are the material by whose you can achieve this objective.

So you write here the name of the material reference material it may be NPTEL video lecture, it may be a book, it may be a paper, it may be a elevation and anything but do not copy paste in here because there is (())(13:51) problem so you can say that Therasa book chapter number 5 page no this to this to achieve this objective and besides student will go there and search it ok

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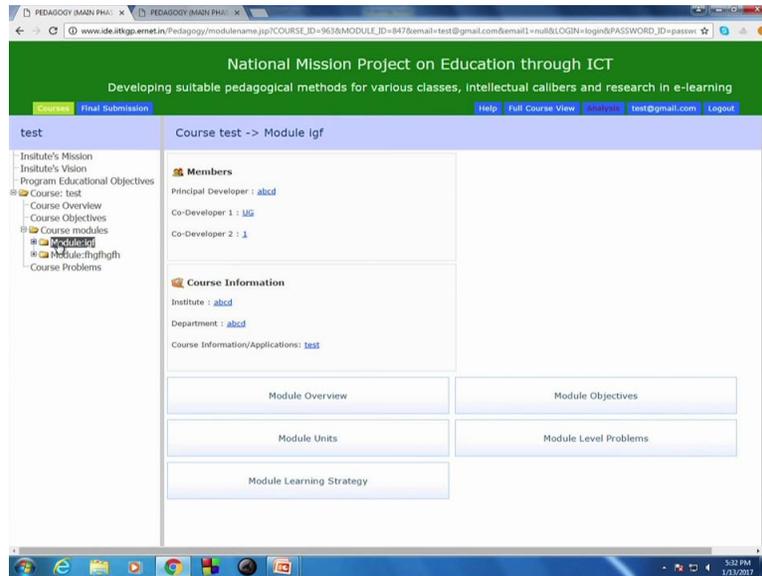
So I . this module so you are developing a whole course whole 40 lectures course may be 5 to 6 module every module is there ok.

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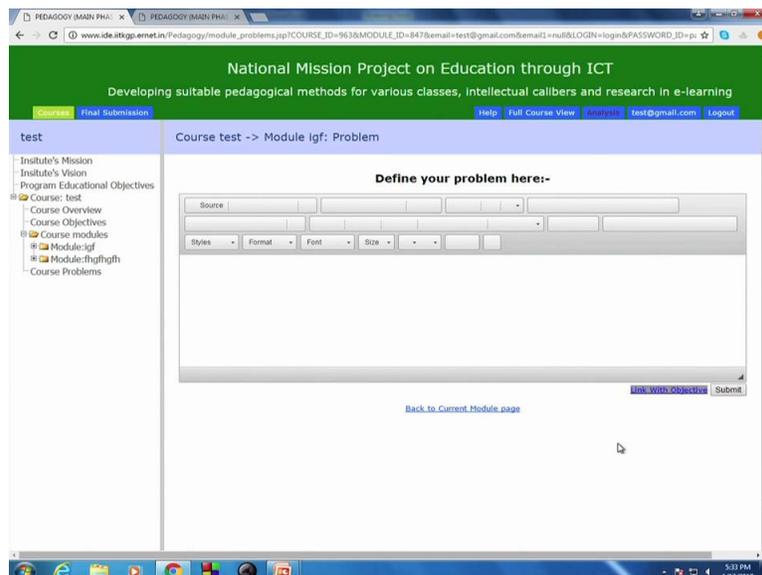
Now there is a analogue item called module level problem. What is what I said every outcome must have a test item. If I say this is my course out come this is my curse outcome file, there will be a test item related to outcome file so that students self myself can test whether they achieve this outcome or not. How to do it there is a course level problem.

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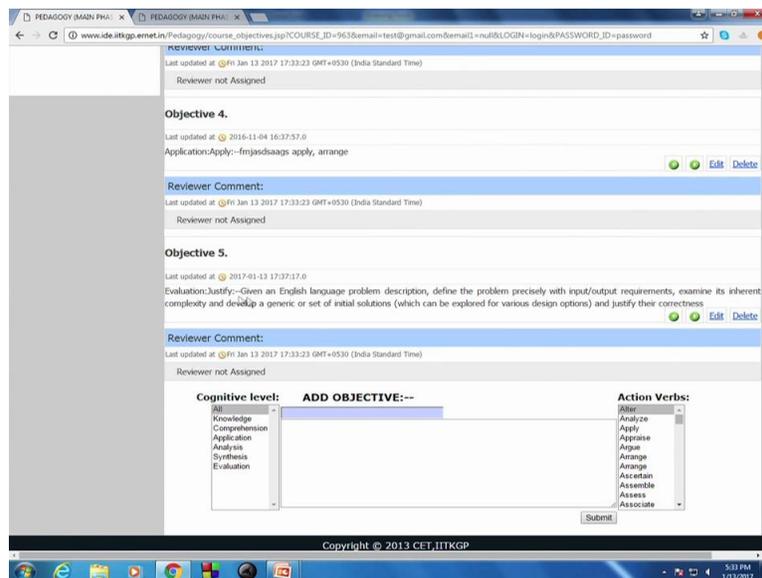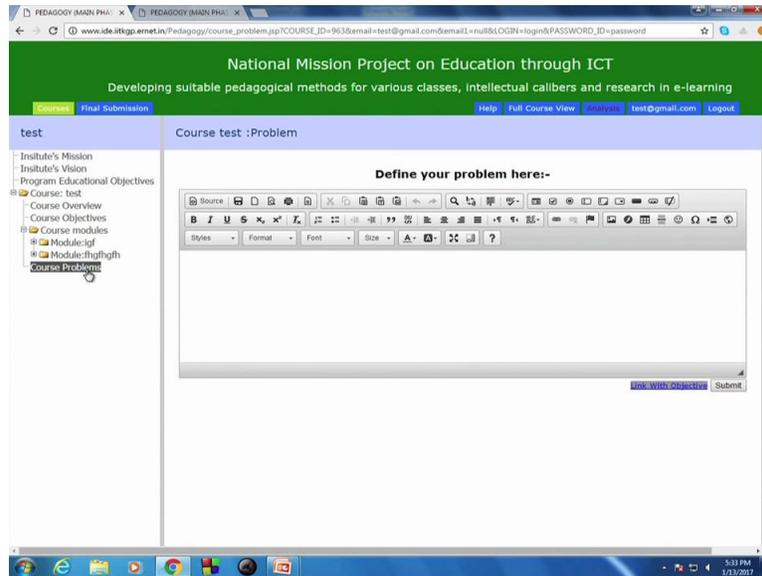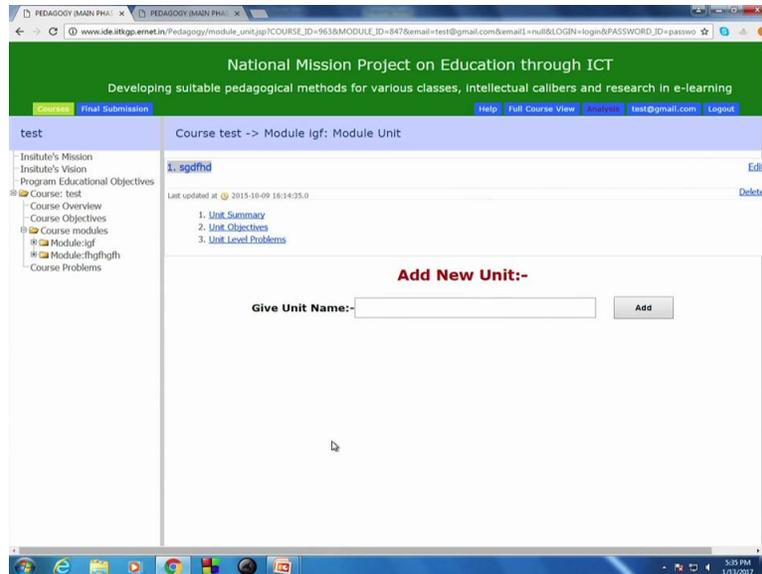
You will click on the course level problem then here is a link with objective all objective will be listed down, so I write the problem here and link with this objective. So I said this problem objective5 (())(15:12) to objective5. So as student first I will see the document you can say if I able to solve this problem number 1 without any hesitation.

I can achieve the outcome 5, I am achieve the outcome 5. So its promote the self-learning now students tried and cannot do it this objective supposed to be achieved by the module 1 and module 1 is over but you cannot achieve it than he come to the teachers and say I have a misconception like this I tried to do this but it is wrong then teacher said your misconception like this that is why this solution is wrong.

So the class becomes a interaction between the students increase the communication skill of the students it increase the team work it increase the self-learning abilities it increase the student ethics also that I have to learn by all then if you say any module there is a module limit so a module consists of several lectures. For every lectures there will be lectures summary which is called unit summary there will be a lecture objective again I have to write the lecture objective and for every objective I should have a lecture problem.

Students should know suppose you prepare this document whole document is available to the students and as a teacher I said tomorrow I will take the lecture number 5 so he knows lecture objectives, he knows lecture summary, he knows lecture level problem.

At the hostel you told the prepared with this lectures and come into the class, I will discuss the possible misconception of this lecture instead of delivering. The material because material is I have already given unit summary, objective and problem all I have given to the students and I have told them unit one and module learning strategy.

Lets unit one is a part of the module one I said in module learning strategy every for unit one you go to this book this page. So they know for unit one which book I have to study which NPTEL video I have to study study it and he tries the test test item finally able to solve it if he able to solve it then he achieve it but if he does not he come the class and discuss what is his misconception instead of receiving the information provide by the teachers ok.

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List of released Courses

Courses by Discipline

1st Year Course (18) (5)
Chemical Engineering (27) (11)
Civil Engineering (24) (8)
Computer Science and Engineering (22) (11)
Electrical Engineering (21) (1)
Electronics and Communications Engineering (24) (4)
Mechanical Engineering (20) (2)
Mixed Group (30) (9)

Developed Courses other than this Project

Applied thermodynamics
basic computation and principle of computer programming
Compiler Design
Data Structure and Algorithms
Data Structures Using C
Data Warehouse Data Mining
Electromagnetic field theory
ELECTRONIC SWITCHING SYSTEMS
Faculty development Programme for Effective Teaching
INSTRUMENTATION AND CONTROL SYSTEMS
Kinematic and Dynamics of Machines
Marketing Management
Operating Systems
Protien and Amino Acid Metabolism
SOIL MECHANICS

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1st Year Course (18) (5)   Chemical Engineering (27) (11)   Civil Engineering (24) (8)
Computer Science and Engineering (22) (11)   Electrical Engineering (21) (1)   Electronics and Communications Engineering (24) (4)
Mechanical Engineering (20) (2)   Mixed Group (30) (9)

Amrita Viswavidyapeetham University (7) (3)   Birla Institute of Technology and Science, Pilani (7) (0)   Birla Institute of Technology Mesra (12) (4)
IIIT Hyderabad (4) (0)   Indian Institute of Technology Bombay (2) (0)   Indian Institute of Technology Delhi (9) (0)
Indian Institute of Technology Guwahati (12) (6)   Indian Institute of Technology Kharagpur (36) (7)   Indian Institute of Technology Roorkee (27) (9)
Mmotilal Nehru National Institute of Technology Allahabad (1) (0)   National Institute of Technology Durgapur (10) (5)   National Institute of Technology Rourkela (2) (0)
National Institute of Technology Trichy (6) (2)   National Institute of Technology Warangal (27) (5)   S.V. National Institute of Technology Surat (13) (5)
SASTRA University (11) (6)

Discipline: 1st Year Course
Institute: Amrita Viswavidyapeetham University

Search

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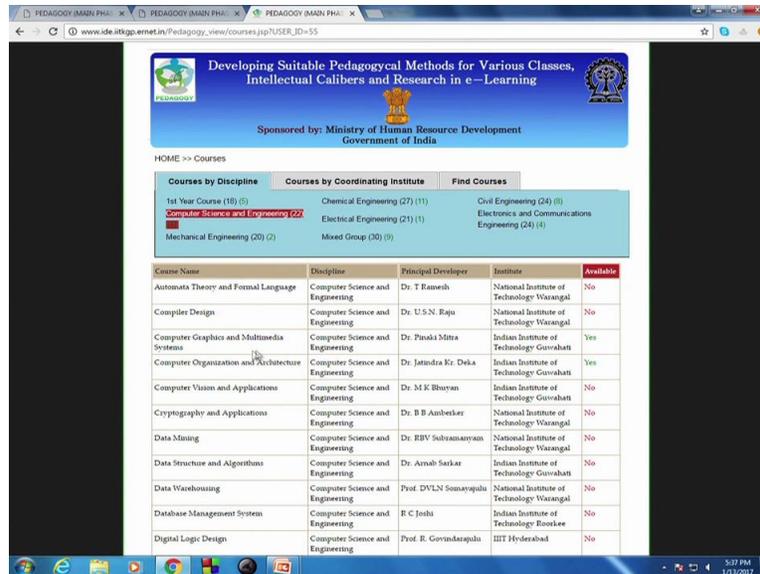
So same liquid objective so you can use this framework to develop your whole course and once the course is developed if you see and you submit for public review then if you see if I view in the course view there will be a page will come up while all the available course are there. If you see there is a lot of complete courses are there ok. So let us computer science if I click there are lot of courses of their in the computer science.

It will open up lets load it, so let us I will go to the computer . computer . computer organization. It will click student will click the course whole course will open up. Let us take some time to open up with I will show you how the feedback will come. So whole course will be open up there then student can visit the lecture number 5. I will show you . this is opening rendering problem it is come it is open up ok.

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Course Level*	UG ○ PG ○
Semester*	1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○

So course view describe the different courses now I can show you another (())19:46) called institute registration. Suppose as a matter of fact that all of you are very much sincere to develop all whole institute course in using this curricular this framework then you can do a one person from your institute can do a institute registration and he can register for all programmes.

So if you click on the institute registration it will come register your institute, you write that institute name, institute representative name, email ID, password, institute mission, institute vision and submit it then once you come to the institute lets once you institute register then it will come like this way then add programme. You can add any programme of your lets computer science programme.

So you write computer science programme evo programme educational objective then submit. Once you write the programme inside the programme there will be different courses will be available. All courses you can then you can say that all courses are there, register the courses register your courses for computer science programme. All courses as a moderator you will register and send the password to the corresponding developer then they will see the courses click the courses and develop their own courses ok.

Once the whole courses are available so structured data is available then I will show you how the MBA documents fill up in the MBA documents is very become very easy, how the outcome will match to programme specific objective or programme objective and how that programme objective is messed to programme educational objective. I will show you that part also.

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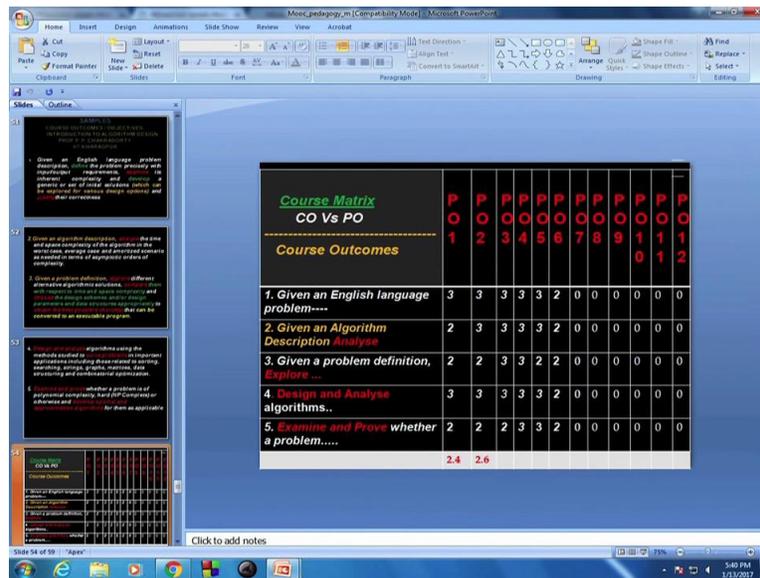
So now if you see the delivery site (())(21:31) so if you see the delivery site I will explain later on so lets those who can do institute registration ok ok now what I said that I told you that once the whole courses of lets computer science department all are developed using this source. So all course outcome are written now which is specific measurable and achievable then course to po or pso programme specific objective, if it is electronics instead of po I write pso and it is course course objective.

So those are the course objective, have written now this way. This is the pos 1 to 12 for MBA for (())(22:17) whatever this 1 to 12. Now let us I say the 3 point lyca scale that if this objective is matched to this po attribute fully then I put the if it is partially matched put 2, if it is 30 percent matched put 1, if it does not match I will put 0. So that way for every objective I will go to each po and put some number.

Now what I said see that given an (()) (22:49) description analyse. This may be fully occupy that domain dependant . fully matched with the domain dependant objective sorry.

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Course Matrix CO Vs PO — Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1. Given an English language problem----	3	3	3	3	3	2	0	0	0	0	0	0
2. Given an Algorithm Description Analyse	2	3	3	3	3	2	0	0	0	0	0	0
3. Given a problem definition, Explore ...	2	2	3	3	2	2	0	0	0	0	0	0
4. Design and Analyse algorithms..	3	3	3	3	3	2	0	0	0	0	0	0
5. Examine and Prove whether a problem.....	2	2	2	3	3	2	0	0	0	0	0	0
	2.4	2.6										

Domain dependant objective fully matched, domain independent parameters I said teaching learning process will define. If I follow this outcome based curriculum design outcome based training so I can say I scattered to po 12 self-learning ability very much.

So I can put 2 here I can say I building the communication skill so I can put something here. I building the team work I can put something here. So once I say that then for every close outcome how it is matched I fill up then I take the average. Once I take the average and round up it and go to the program matrix.

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Program Matrix - Example												
Course No	1	2	3	4	5	6	7	8	9	10	11	12
--------	2	2	1	1	2	1	3	1	3	1	2	3
PH 103	3	2	2	3	3	3	2	0	1	2	1	1
--------	3	3	3	3	2	3	2	2	2	2	2	2
MA 203	3	2	2	3	2	3	2	2	1	1	1	2
-------	1	1	2	1	2	2	3	1	3	2	3	2
--------	2	1	1	2	2	1	3	2	3	1	2	3
EE 409	3	3	3	3	3	2	2	2	2	2	2	3
CS 410	3	3	3	3	2	3	0	0	0	0	0	0
HS 211	1	2	1	2	3	2	3	2	3	2	1	3
EE 100	3	3	3	3	3	2	1	0	0	1	0	0

So in program matrix those are the programme outcome and this is the course number this course match with this programme. This is the average come from the each and every objective average so a ph 1003 may consists of 6 outcome. So for the 6 outcome I develop a better average scale that scale is I put it in here.

Once this matrix is fill up then I know which are the course I have to talk so course outcome and course number of courses is defined by the coverage of the matrix not arbitrary ok. Now I will go the software again I think it is already open.

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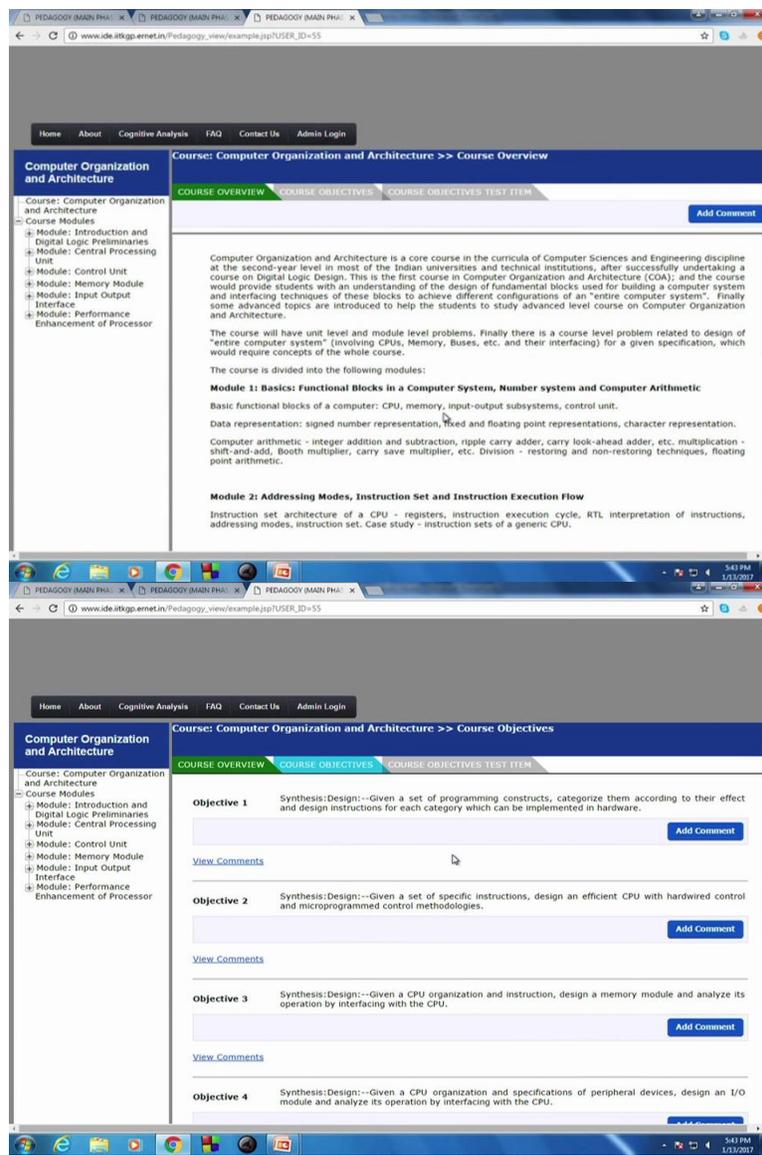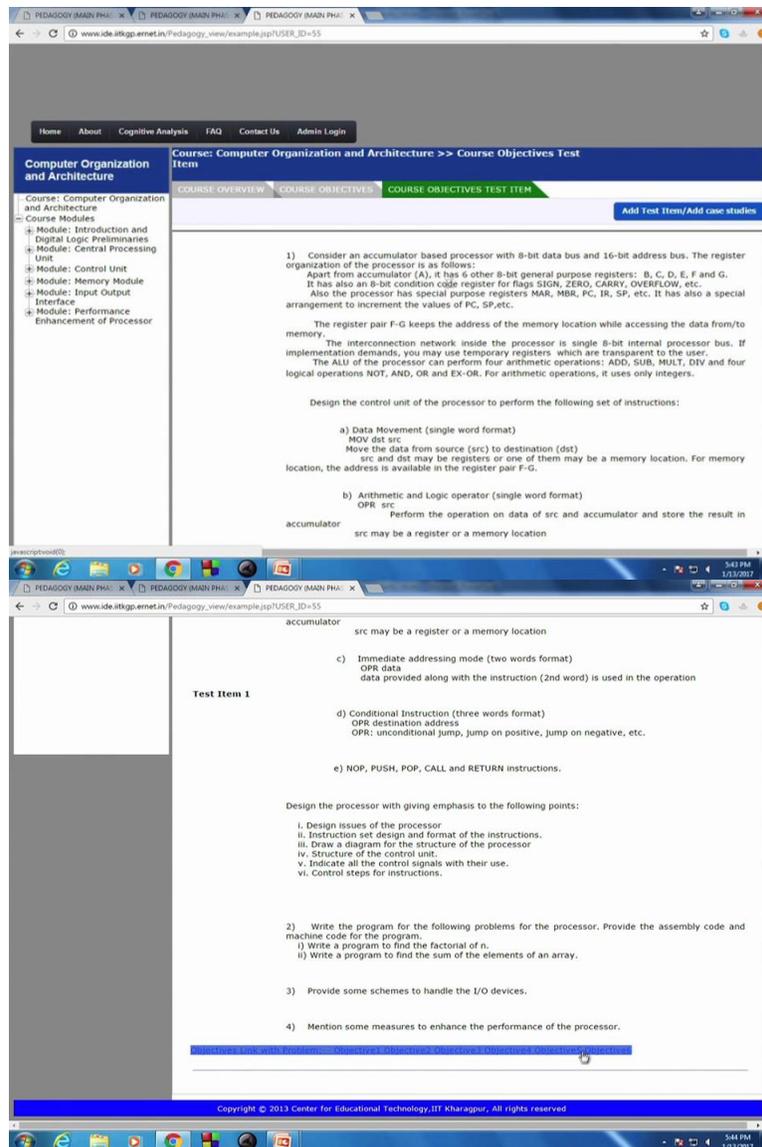
So now see this is the delivery site once your course is submitted for public command anybody can see your course like this. This is the course overview, course objective ok so this objective I have to achieve, this is the test item I have to this is the problem. If I able to solve this problem I have achieved the objective number 1,2 and 3 and 4 . 1,2,3,4,5,6 all.

So that means if I able to solve this problem I am achieving the course objective ok. Now course objective is given, now suppose I write this course objective and some expert or some industry said or some of your friend who is very good in this course said. This objective is not correct because this kind of skill set is no longer required for this industry.

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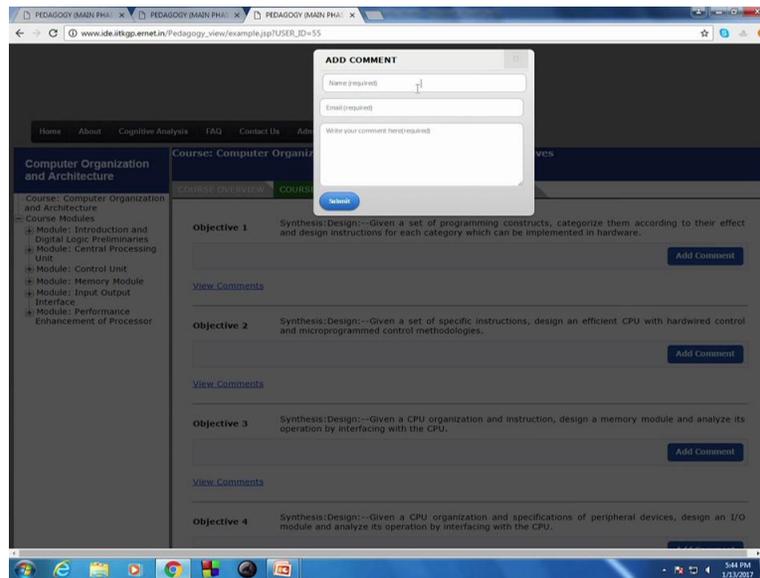
Then he can add a comment write his name and email ID and write his comment. Once he submit the comment that is visible to you, your friend given this comment with respect to this objective. So if talk to his industry give me the comment on my curriculum does not, nothing is there nothing specific is there. What kind of comments will be there he give so he will say some general comment but here everything is specified.

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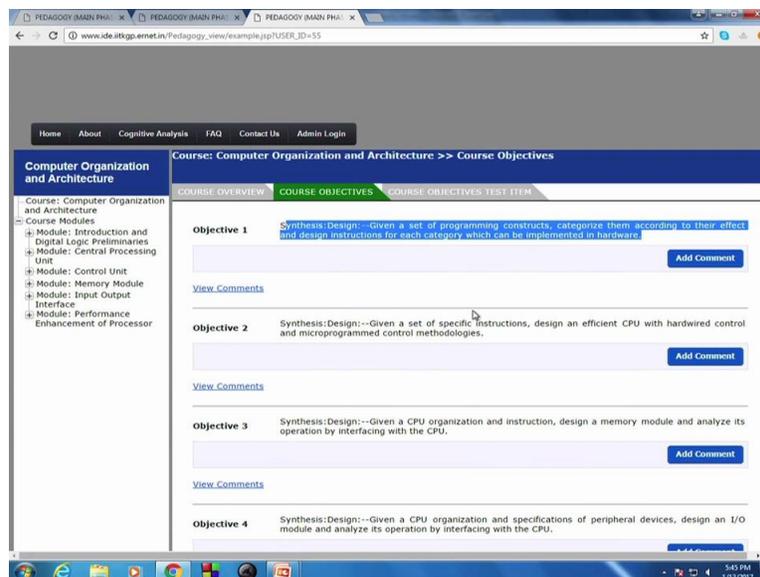
Suppose this course is programming in data structure some very good software company can say this kind of skill today does not required. We are looking for this kind of skill more of less so you will add that comment ok. Now test item suppose somebody said this is the one problem by which all the objective can be said tested. Somebody means no this just one problem I am adding it which can test the objective number 2, very good in objective number 2.

So I will add the problem here in click the objective number 2 and submit. Once I submit it problem is come to the developer and he said somebody expert says that this kind of problem much more clearly test the objective 2. It is a course developer preview whether he agree or not, if it is agree he said agree and that there and there it will be modified or it will be added resource will be listed there in this site. So students can say ok this and this problem is added by some industry so I try to solve it ok for test items.

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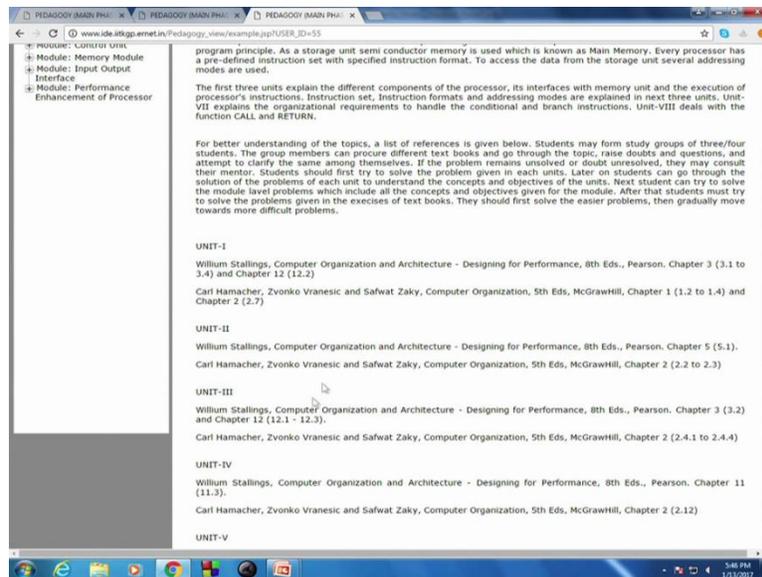
Similarly if I say a model so lets module 1 module. I said module learning strategy, there is module learning strategy unit one this book this chapter unit 2, this book this chapter is already written now. Somebody said here is an very good material from industry or from abroad. Here is an NPTEL video created by this person and this concept explain very good. We can add it, it is there in there it will be added and students can see ok those are the material set by this (())(28:04) ok.

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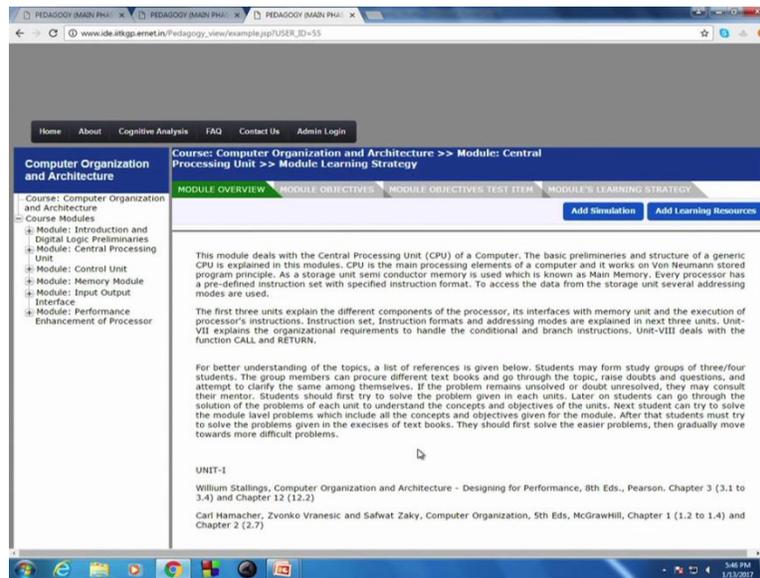
So I can say if I develop this course and openly available to the students, academia, faculty, experts everybody. Everybody by collaboration we can improve (())(28:21) by collaboration you can convey the students that you have to develop this skill and those are the material available, those are the lecture available those are the test item available it is your responsibility to acquire the skill and if I say as a teacher at the end of the semester I only test whether you have acquire the skill or not.

None of the students require to study the last three years question paper. They are already know what kind of question paper will come but it cannot be answered by memory. It has to be skill instead of memorization ok. So I will not repeat any problem I will give a problem which is new to the students but concept will be the same because I want they should apply their skill to solve the problem ok.

So I think (())(29:27) after the theory part is over . it will be come in assign number 3 will be based on this software. All of the participant, all of the learner of this course has to develop their own course objective using this software which is free available and I will check that objective and I will give an another half an hour lecture based on that good objective and bad objective ok. Thank you.