NBA Accreditation and
Teaching – Learning in Engineering
(NATE)
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Lecture 22
Course Design

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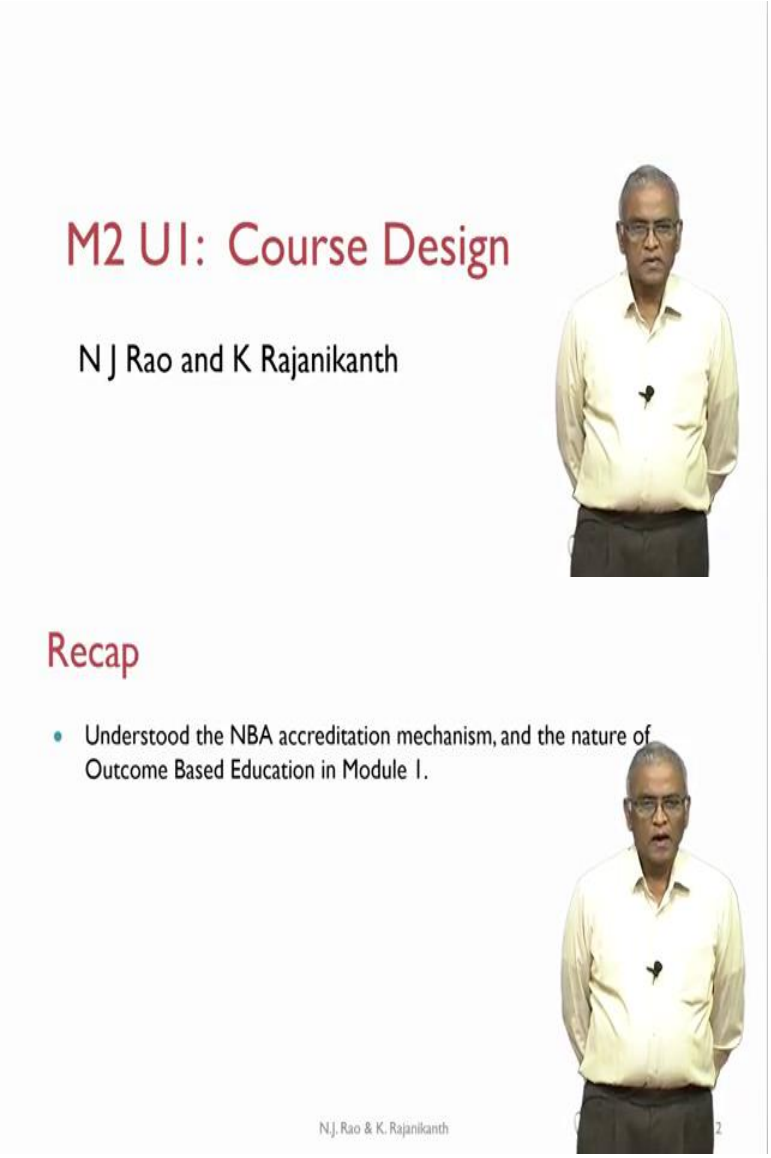

Greetings and welcome to module 2, unit 1 on Course Design. In the earlier unit we understood the NBA accreditation process and the nature of outcome based education in module 1.

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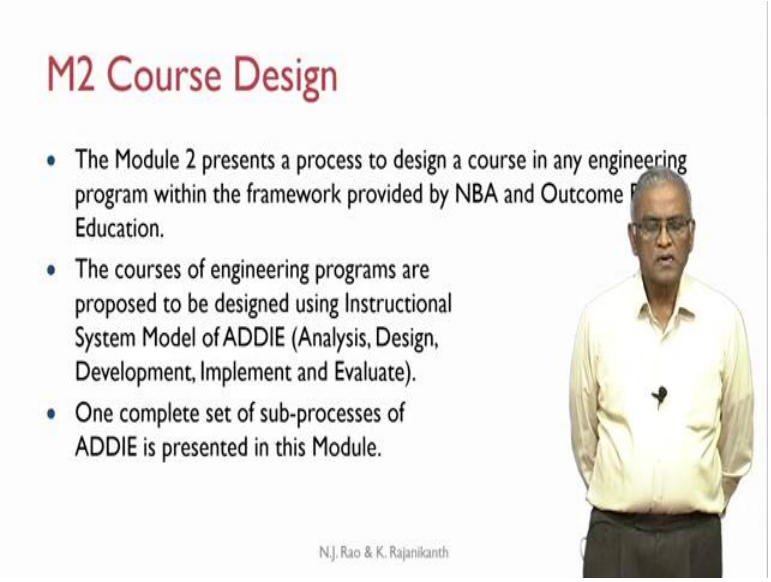

And module 2 is now going to mainly look at course design. What does it consist of? It presents a process to design a course in any engineering program within the framework provided by NBA and outcome based education. Because NBA accreditation and outcome based education they provide the framework within which all engineering programs have to be conducted.

So, our course design process is also defined in the framework provided by NBA and outcome based education. And the courses of engineering programs are proposed to be designed using instructional system model of ADDIE, ADDIE is an acronym for Analysis, Design, Development, Implement and Evaluate. Here we this module will also present one complete set of sub-processes of ADDIE in course design.

As we will see in this module that the sub-processes are not universally defined for under ADDIE the sub processes can be defined by the instruction designer or the a course designer. And here the sub-processes are identified to make sure that your course is conducted in the framework of NBA and outcome based education.

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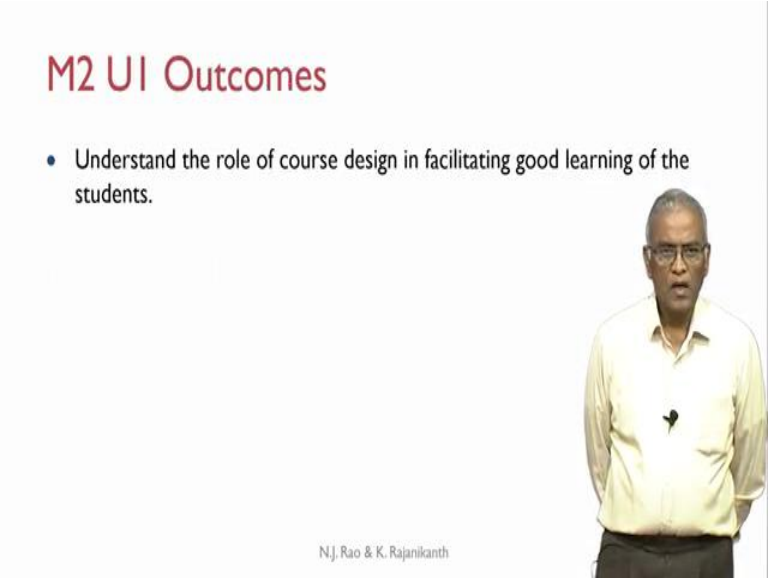

Now, in unit 1 of module 2 we understand the role of course design in facilitating good learning of the students.

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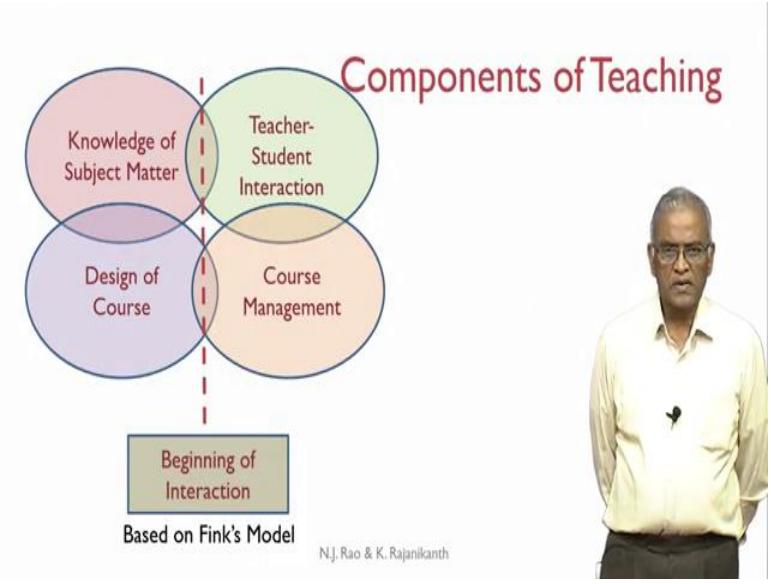

Let us look at the components of teaching as given by Fink. Fink has provided a model of the teaching. Now, he identifies mainly 4 components, one is knowledge of subject matter, teachers-students interaction, design of course and course management. As we can see all the components are not mutually exclusive.

There are, there is an overlap and also the vertical line represents the activities that need to be done on the left side prior to the actual start of the course and are that is a beginning of a instruction or interaction with the students and the right side presents the, during the course the kind of components that play a major role okay. Now, let us look at these 4 components.

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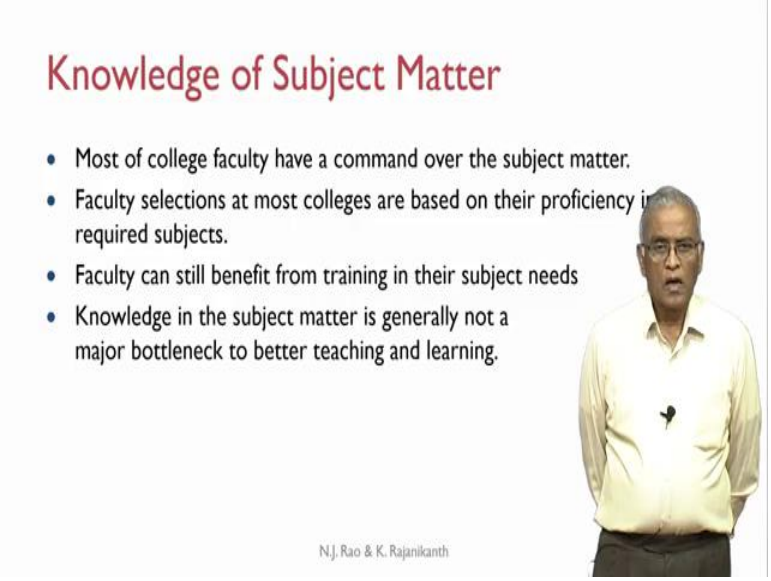

Knowledge of subject matter we make an assumption that most college faculty have command over the subject matter, there may be exceptions but by enlarge will make this assumption because faculty are selected by a college based on their knowledge of the subject. Because most of colleges they have their own faculty selection processes where the proficiency in the required subjects is kind of tested out.

But what happens sometimes the faculty are required to teach subjects in which they have not specialized so you do have situations where the faculty are not necessarily have the required command over the subject matter in such cases they can take advantage of the training programs that are generally provided in their subjects generally UGC, AICTE they keep conducting programs for the benefit of faculty where their subject knowledge is, is kind of updated.

And we make an assumption knowledge in the subject matter is generally not a major bottleneck to better teaching and learning. We make an assumption it is not necessarily true all the time.

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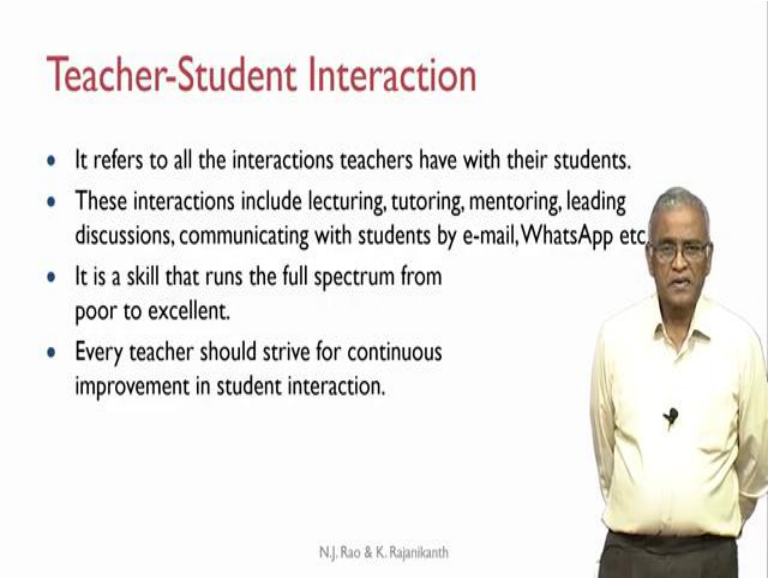

And teacher student interaction, it refers to all the interactions teachers have with their students okay and what do these interactions mean? These interactions include lecturing in the classroom, tutoring if you have a tutorial or mentoring you talk to students outside the classroom regarding their difficulties, their future plans and so on, an leading discussions in the classroom, communicating with the students these days by Email and WhatsApp or any other tools that people use.

So, as you can see teacher-student interaction can come under any of these categories and this is where the difficulty comes. It is a skill that runs the full spectrum from poor to excellent. Somehow this skill is not uniform across all faculty some are good at communication or interaction with the student, some are not and unfortunately the kind of the skill level where you start your career somehow on this dimension does not change with the time which is an unfortunate thing.

And every teacher should try for a continuous improvement in student interaction there is nothing like saying that now I have mastered there is no need to further improve because teacher-student interaction can continuously improve there is nothing like that you have reached the plateau.

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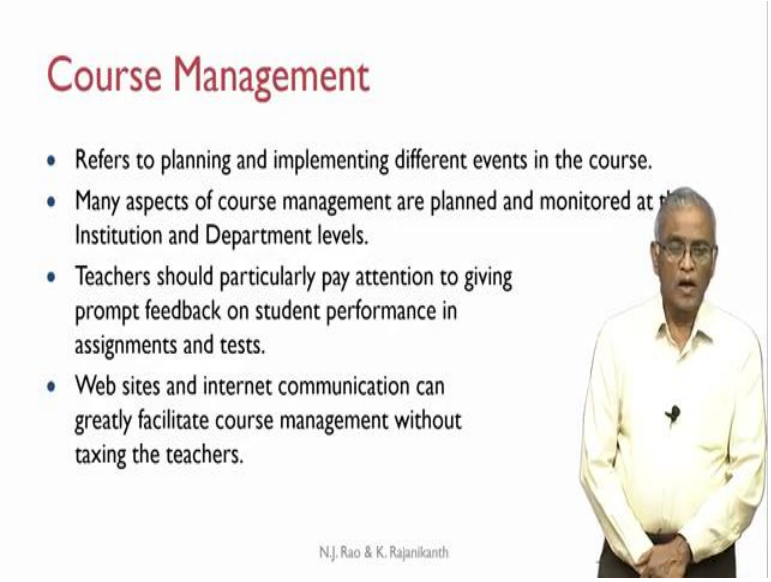

And comes another aspect called course management. It refers to planning and implementing different events in the course. What are the different events in the course? This includes when do you start the classes in a semester, when do you conduct exams, when do you have holidays or when do you give a preparatory holidays, when do you conducts exams and so on and on. All these aspects of course management are planned and monitored at the institutional department level.

Fortunately this is a practice in most of the institutes whereas in some institutes the faculties seems to have unlimited freedom in terms of even in course management which is not particularly good thing. But here because its a department requires or institution requires and NBA also kind of expects this to be done and even in a very-very a what you call remote poorly equipped or rural engineering college also this course management generally happens fairly well.

And the only thing the teacher needs to pay special attention is to give prompt feedback on student performance in assignments and tests. When to conduct the assignment and test is decided by the institution. But giving feedback on the performance of the students is something that teacher should particularly pay attention. And fortunately these days, websites and internet communication can greatly facilitate course management without taxing the teachers.

When you want to give individualized feedback it can mean quite a lot of work to the faculty member. So, using internet communication you can at least see, you can reduce the amount of the work that needs to be done by the teacher.

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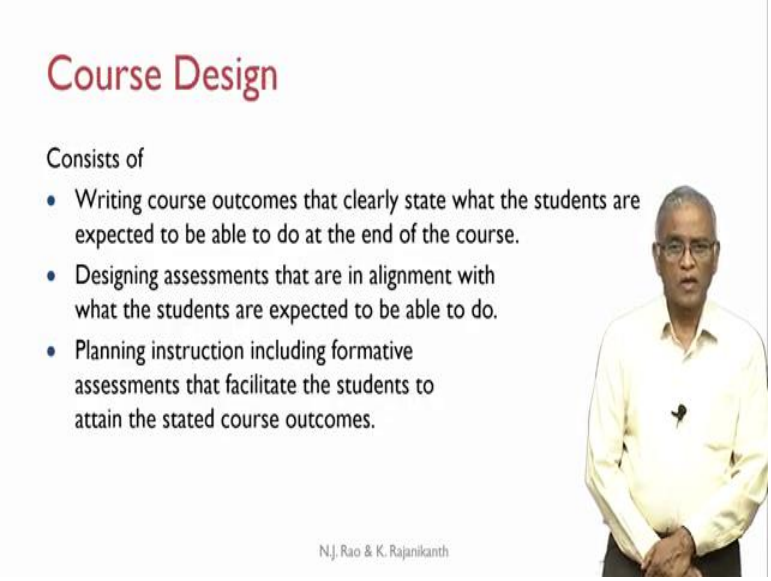

And now we come to the course design, what does it consist of? Course design consist of writing course outcomes that clearly states what the students are expected to be able to do at the end of the course. This is something we have spent lot of time in the module 1, how to write course outcomes? How to compute the attainments of these outcome and so on. And then the next part of course design is designing assessments that are in alignment with the, with what the students are expected to be able to do.

Or we can say designing assessment, assessments that are aligned with the course outcomes this also we mentioned but this is now mainly part of course design. And then planning instruction including formative assessments that facilitate the students to attain the stated course outcomes. So planning instruction is also part of course design. So, these are the 3 stages writing course outcomes, designing assessment and planning instruction are the 3 parts of course design.

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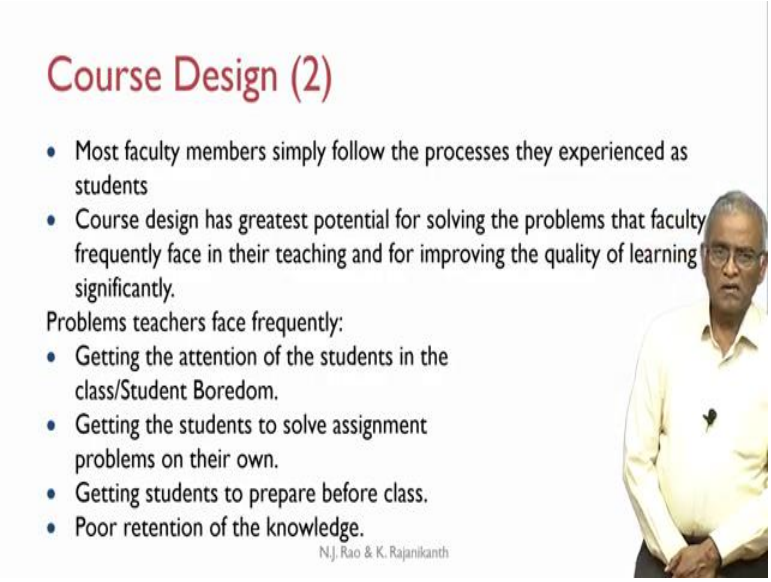

And here course design if you look at how people do at present most of them simply follow the process they experienced as students and what does it consists of, it consist of nearly looking identifying the list of topics, identifying the textbook and you follow your textbook exactly chapter wise and presenting the information in the classroom.

But the course design has the greatest potential for solving the problems that faculty frequently face in their teaching and improving the quality of learning significantly. And actually by good course design it is possible to overcome some of the, what you call limitations some of the faculty have with respect to communication or with respect to the competency in the subject.

If you follow a systematic course design process some of these issues can be resolved even before you enter the first class. And which are the problems teachers face frequently, getting the attention of the students in the class or what we call student boredom. This I am sure all of you would have experienced this students somehow suddenly lose interest for a variety of reasons in the classroom. Getting the students to solve assignment problems on their own this is a major issue.

First thing is they do not have motivation to solve and then they consider somehow it is unimportant so one or two people solve the problems and others nearly copy them. But this is where actually students learn if they make an attempt to solve the assignment problems on their

own students do learn and another issue getting the students to prepare before the class this has a great value if they can be (14:04) to read a little bit of material before coming to the class, the classroom interactions can be made lot more beneficial.

And then on top of that poor retention of the knowledge, there is you just remember briefly maybe for the sake of test and then you forget or when you carry when you require this material or this concepts or procedures in the courses in the following semesters students will not seem to be retaining their prior knowledge.

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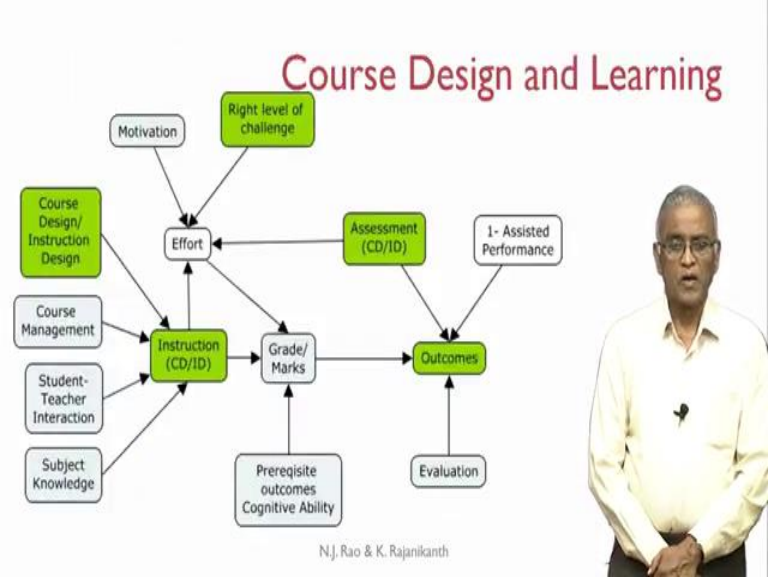

Let us take a look at a graphic way of representing the role of course design. Once again this is not a unique relationship but it is a representative relationship and most of elements that are of concern for course design and learning are included. Let us take a look at these are the outcomes that we are interested in attaining. The student needs to attain these outcomes what these outcomes are we have already defined.

When do you say the student has attained these outcomes by enlarge if he gets a good grade or good marks in a particular course we equate it or we consider it is synonymous with attaining the outcomes. But is it true? The outcomes you can say outcomes represent the grades or marks provided you have your assessment right. That means if I ask very elementary, very superficial questions and if the student gets good marks it do not mean that he has attained the outcomes.

Or sometimes I may also make the assessment very difficult and then also what happens the most of the students perform poorly and even then the grades or marks will not represent the outcomes. Then there is another issue, the evaluation is very lenient or very difficult if in either case the marks do not represent the outcome attainment okay. So, first thing is assessment and evaluation should be right.

And let us say we vaguely talk about if it is one each that means evaluation is done right and assessment is done the right level. How to do it right? We will see in the following units. But if these two are done right then we can consider outcomes are represented by grades and marks. There is another issue which is also universally valid across the world this is what we call I named it as 1 minus assisted performance.

If assisted performance is 0 then it represents 1, that means outcomes and grades and marks are directly correlated. What is assisted performance? Different places different things happen in some places they allow students to copy from each other or they allow people to get what we call generally slips or refer to some material that which is I can carry inside or even sometimes invigilator themselves will supply the information and not only that what we call grade inflation.

Even after evaluation you start doing moderation and keep adding marks and so on. So if all such things happen I generally I am trying to I am calling it as assisted performance 1 minus assisted performance if this is equal to 1 that means assisted performance is 0 then in that case if we have the right assessment and no assisted performance and right evaluation outcomes attainments and grades and marks, grades or marks are directly correlated or directly equivalent.

Now, let us look at the blocks there are in green colour. They are all part of course design, there all the activities included in the course design. And the Finks model is presented here subject knowledge, student-teacher interaction, course management and course design or instruction design these are all and all this four together will lead to instruction okay.

But instruction will also determine take this instruction will determine what grades and marks students are likely to get. If it is a poorly, the classroom interaction is poor it will have the impact on the grades and marks. And also if you do your instruction well students are likely to put more

efforts in their learning. So, more effort will lead to better marks and effort itself is a function of the their perception of what assessment is, okay.

And the motivation of students and right level of challenge if the student consist the subject is too difficult for him, he will not put the effort. If he consists the subject is too trivial superficial then also he will not put the effort. And the motivation is very complex thing in the sense all students are not expected to have equal motivation in all subjects. He maybe intelligent but he is not motivated such a situation will come.

And here if you look at motivation and right level of challenge and the he is perception of assessment will determine the effort that is going to put in and this effort and the instruction together will decide how many marks he will get. That is another factor does the student have the required prerequisite knowledge or prerequisite outcomes as he mastered that? I maybe be intelligent but I have not mastered and also the cognitive ability of the student.

Obviously some students have better cognitive ability some do not have. Actually if you take our engineering colleges across the country you will have a very wide spectrum of this cognitive ability so this also will decide how many marks and grades that you get. And what happens is, because of this complex relationship the system somehow seem to keep on getting adjusted your knowingly or unknowingly either by way of poor evaluation or making the assessment very poor or sometimes assisted performance in trying to make sure that the students do get the good grades and marks okay.

So broadly, this presents the inter-relationship between among all the activities that are involved of which many of them come under the, our what we are calling as course design okay.

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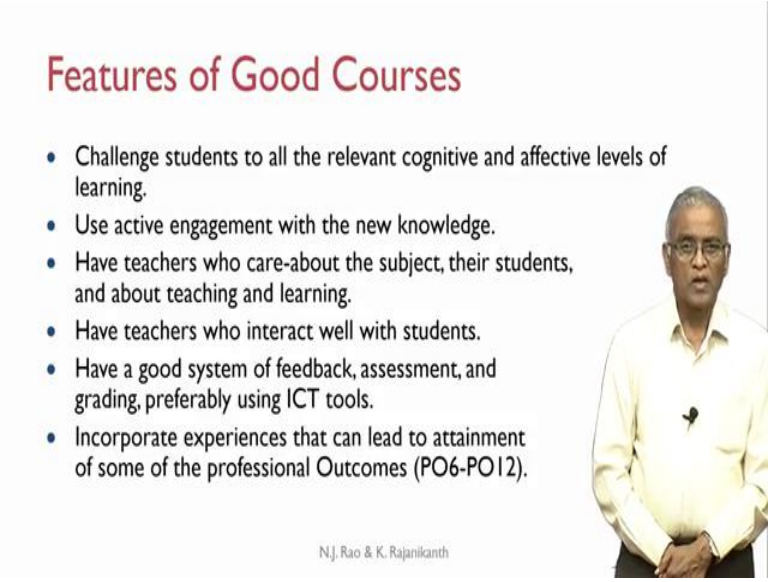

Now, what are the features of the good course? These are all kind of wish statements, nice statements to talk about when do you call something as a good course. A good course challenges students to all relevant cognitive and affective levels of learning. We are familiar now with all this words cognitive and affective levels of learning. And a good course uses active engagement with the new knowledge.

Student is not merely passively listening to the information given in the class but he is actually engaged with that what that active engagement we will see it in subsequent units. And good courses have teachers who care about the subject, their students and about teaching and learning. And good courses have teachers who interact well with the students and they have a good system of feedback, assessment grading and preferably using ICT tools.

And also they incorporate experiences that can lead to attainment of at least some of the professional outcomes namely PO 6 to PO 12. Now till now the course design whatever methodology people followed never really bothered about these professional outcomes, the 7 professional outcomes. Now some activity, some experiences students should have that address at least one or two of these professional outcomes. Otherwise we will not be able to meet the 7 professional outcomes which are required to be met by, met as per NBA accreditation okay.

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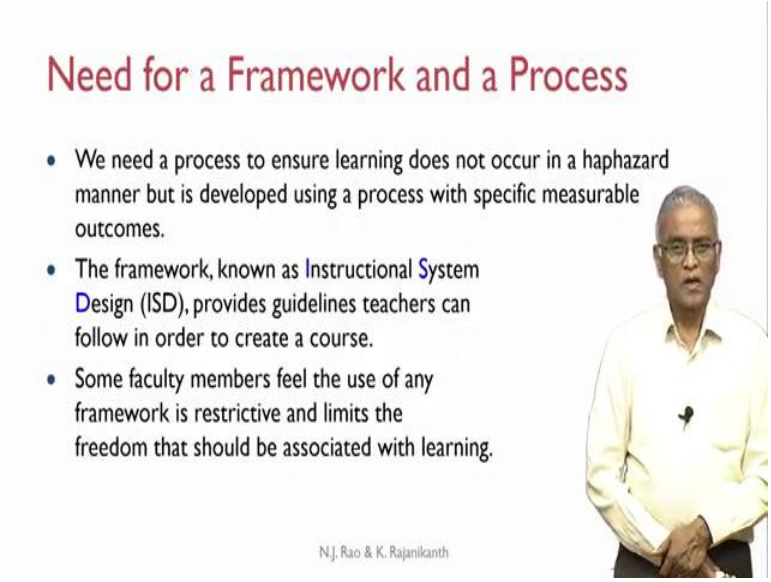

Now as we said course design is the key, key for good learning and now we also require a framework, framework and a process, so that it is not left to chance occurrence or only certain faculty believe in it and they may even they believe in it, they may or may not be able to design a process. So, here we consider a good course design requires a framework and a process. So, we need a process to ensure learning does not occur in a haphazard manner but is developed using a process with specific measurable outcomes.

Such a framework is normally called ISD Instructional System Design framework. And any instructional system design framework that you follow provides guidelines teachers can follow in order to create a course. It gives you a series of process steps but the actual decisional at each process steps the academic decisions are all done by the teacher they are not given what exactly should be taught, how to write or what outcome to be written. Everything is all the academic decisions are done by the teacher.

But when you follow one instructional system design model it gives you a set of steps or a set of processes. But unfortunately, some faculty members feel use of any framework is restrictive and limits the freedom that should be associated with the learning. They consider learning means there should be absolute freedom for the teacher and the student to interact with each other and explore the concern subject.

This is in my opinion is a wish statement it may work with when you have highly qualified faculty, highly motivated faculty and highly what do you call top of the line students in the classroom it may work, even then I have my reservations about such kind of unrestricted freedom that people expect with respect to teaching and learning. As I have mentioned earlier the instructional system design model only presents a framework of doing a series of things in particular sequence.

And all the freedom that is required to do the actual activity right from the first stage to the last stage rest with the faculty members. So, I do not think that is considered as restricting the freedom of the faculty member in anyway.

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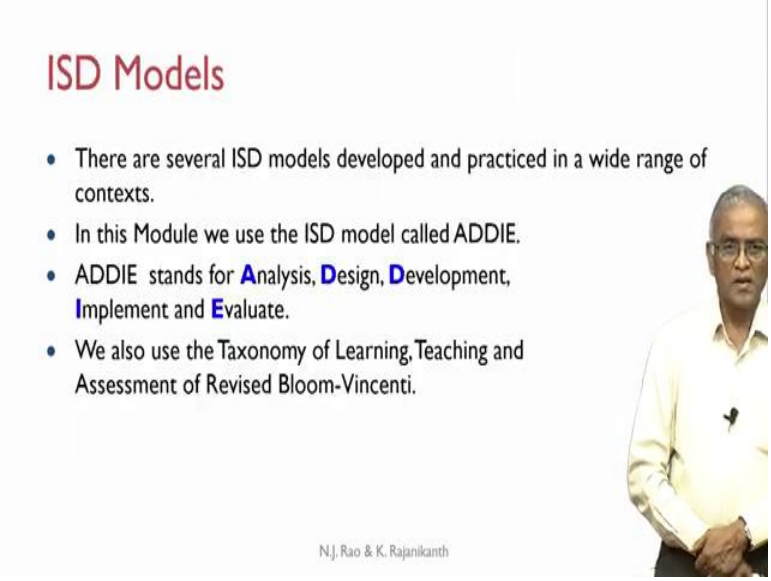

Now, there are several ISD models developed and practice in a wide range of contexts. People develops ISD models to meet different requirements because these models are also used in used by the military, used by the corporates or in educational institutions at school level, college level and professional program level and so on and on. And in this module we use the ISD model called ADDIE which we have already explained ADDIE stands for analysis, design, development, implement and evaluate.

And we also use the taxonomy of learning, teaching and assessment as per revised bloom Vincenti taxonomy. Which we have elaborated in the module 1.

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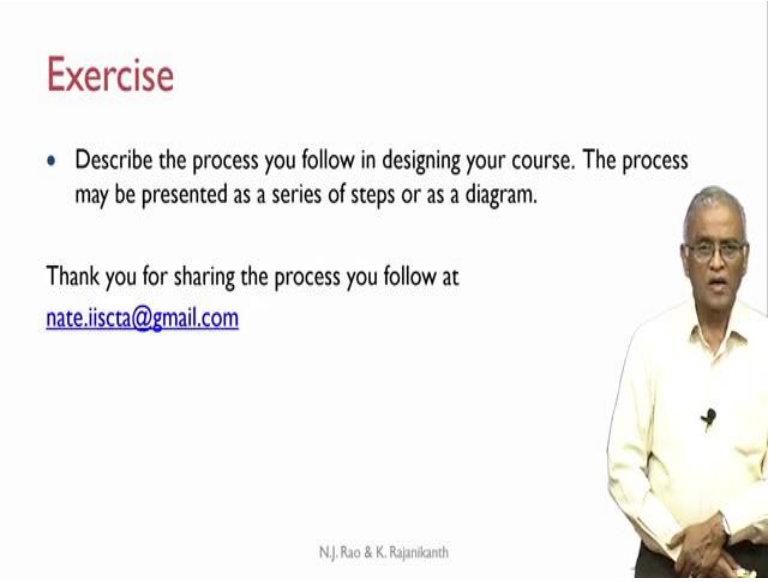

As an exercise we request you to describe the process you follow in designing your course, the idea is whatever process you are following can you write it as a series of steps or as a diagram that you may be following already. Maybe you have not stated on a piece of paper anywhere but we request you take little time and translate what the process that you are implicitly following in to a series of steps or as a diagram. And we will thank you if you can share your output with us at this particular E-mail.

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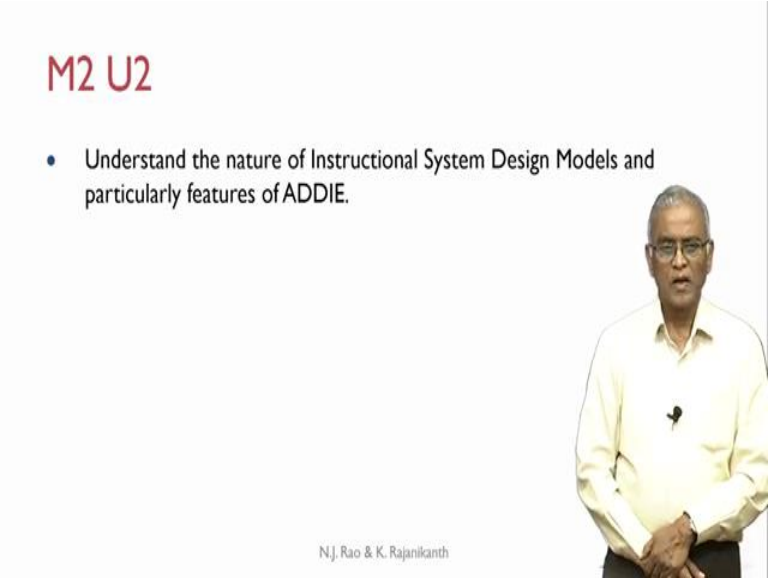

And in the next unit we try to understand the nature of instructional system design models and particularly features of ADDIE. Thank you very much.