NBA Accreditation and Teaching-Learning in Engineering (NATE)

Professor K. Rajanikanth
Retired Principle-MSRIT
Indian Institute of Science, Bengaluru

Lecture 62
Summary

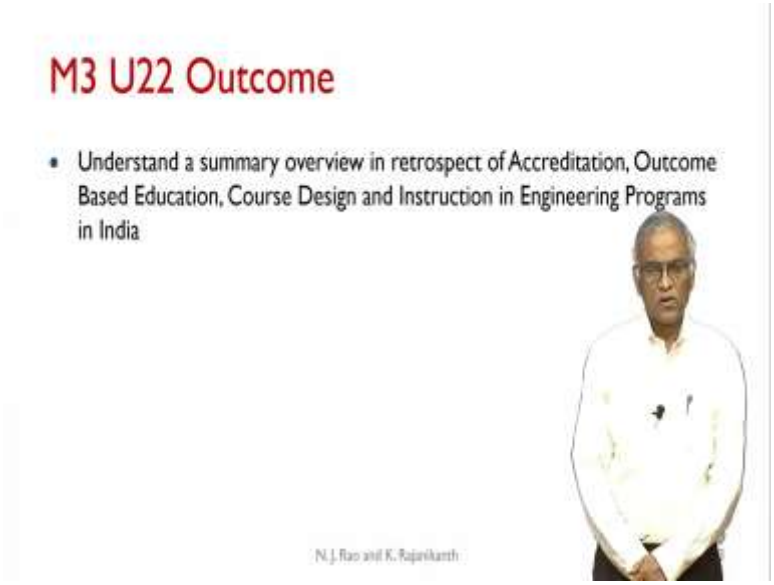
(Refer Slide Time: 00:28)

Greetings and welcome to NATE module 3 unit 22.

(Refer Slide Time: 00:37)

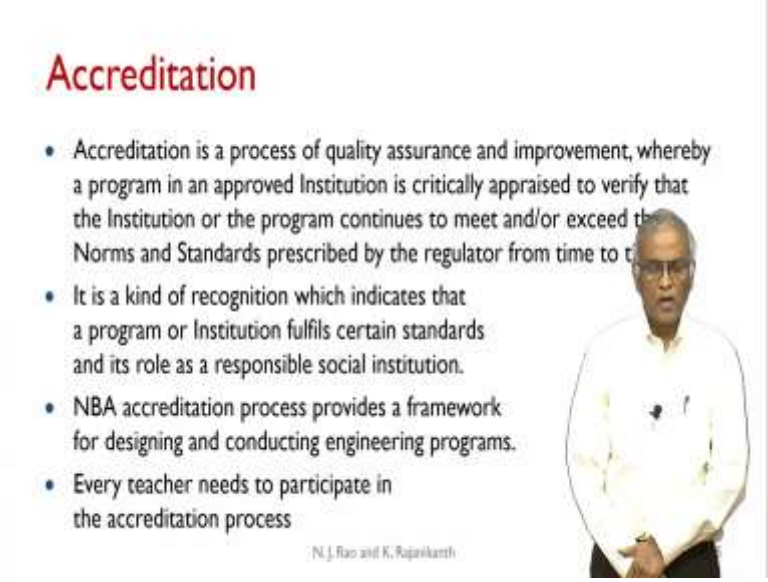
And in the earlier unit understood the indicators for governance institutional support and financial resources which come under the criterion 10 of NBA.

(Refer Slide Time: 00:53)



And having come to the end of the course will try to have a summary over view of what we have done regarding accreditation, outcome based education, course design, instruction in engineering programs in India. So it is a kind of a summary overview.

(Refer Slide Time: 01:17)



Starting with accreditation National Board of Accreditation recognizes the key role of faculty in facilitating good learning by students. And that is the reason why they have assigned maximum number of marks for the faculty related information.

And it also recognizes the need to conduct engineering programs to meet the expectations of stakeholders. So stakeholders are not only students and faculty but they are also there several outsiders including the industry and let say at national level regulatory bodies and so on. So the NATE was design mainly to facilitate the teachers of institutions offering engineering programs this is mainly for the, to facilitate the teachers but they in turn will facilitate their students to become good engineers.

To understand their role in getting their programs accredited by NBA. So these are two main things a program will have to prepare students to become good engineers and also their programs have to be accredited by NBA. So the NATE was design to facilitate the teachers to perform these two activities.

(Refer Slide Time: 02:57)

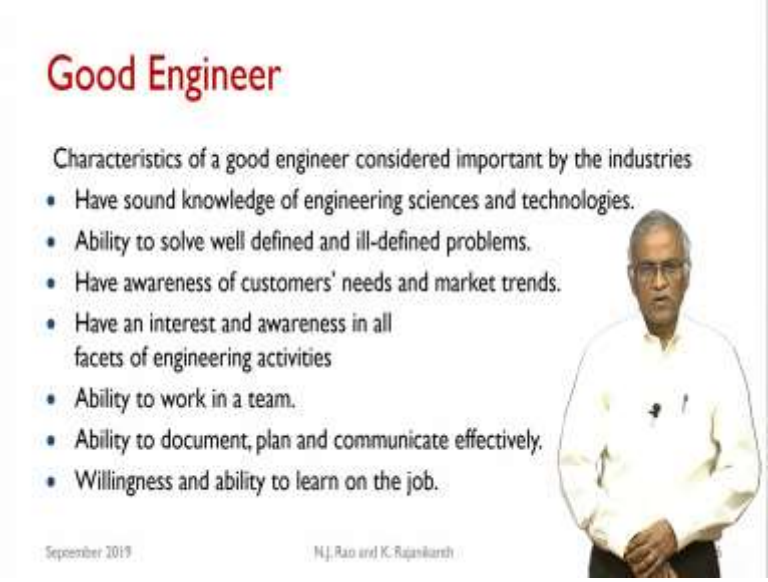
Now accreditation is something that we have already stated it is a process of quality assurance and improvement whereby a program in an approved institution is critically appraised to verify that the institution are program continues to meet and are exceed the norms and standard prescribed by the regulator from time to time.

Remember that some these regulations will keep changing from time to time. And it is kind of recognition which indicates that a program or institution fulfills certain standards. And it is role as a responsible social institution as we said in engineering college is a social institution.

And NBA accreditation process provides a framework for designing and conducting engineering programs. The way we have been looking at we conduct engineering programs the way we in the manner that we consider appropriate or relevant and then some regulatory body comes in kind of measures our performance.

But here the moment the regulatory body comes then they have to some criteria according to which they measure and those criteria now become the framework within which engineering programs have to be design and conducted. That is what it is. Every teacher needs to participate in the accreditation process. So that is a part of every ones duty in fact.

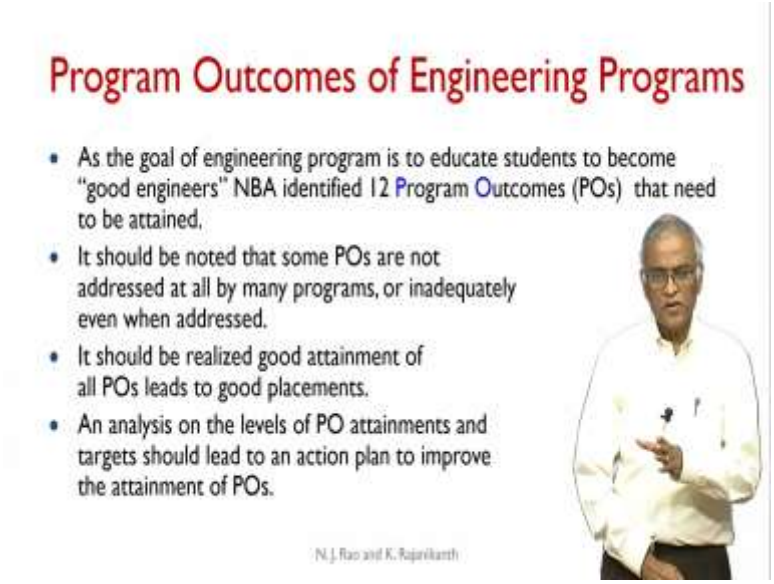
(Refer Slide Time: 04:45)



And who is a good engineer? Because our first primary goal is to train our students as good engineers. So the characteristics of a good engineer considered important by the industries you can change the order depending on a particular organization. The engineer should have sound knowledge of engineering sciences and technologies and they should have the ability to solve well defined and ill-defined problems.

They should have awareness of customers needs and market trends. Have an interest in awareness in all assets of engineering activities and they should be able to work in a team. And a good engineer should have the ability to document, plan and communicate effectively. And also he should be willing to learn all the time on the job. So these are the characteristic of a good engineers as identified by the industry.

(Refer Slide Time: 05:55)

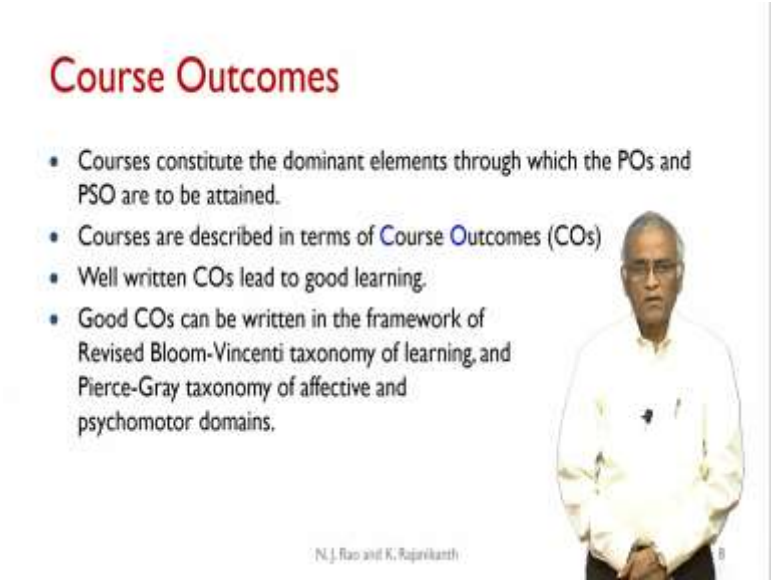


Now, what is the now the role of regulator? As a goal of engineering program is to educate students to become good engineers. NBA has identified 12 program outcomes that need to be attained. These 12 program outcomes approximately are roughly captured all the characteristic of a good engineer. That means your program should be design to ensure that all these program outcomes are attained by all the students.

But it should also be noted that some of the POs are not addressed at all by many of the existing programs or inadequately addressed even if you have addressed some of them they are inadequately addressed. And it should be realized good attainments of all POs leads to good placements because placement is the goal any institution or any program.

So to that extend a good attainment of this POs leads to good placements. So to that extent an analysis of the levels of PO attainments and target should lead to an action plan to improve the attainment of POs. That is what we have stated when we are talking of the closing the quality loop. So they are need to be that means the teachers need to focus on POs and correspondingly and PSOs as well.

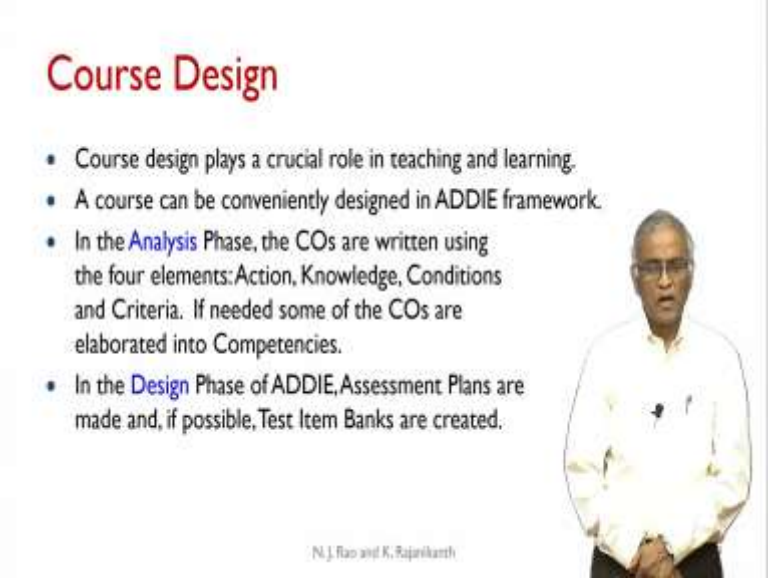
(Refer Slide Time: 07:40)



Now coming to course outcomes, courses constitute the dominant elements through which the POs and PSOs are attained. Though there are some things a few projects mini projects and major projects but the major activity in a program is to attain this POs and PSOs through courses. And courses are described in terms of course outcomes and what we said well written course outcomes lead to good learning.

And good COs can be written in the framework of revised Bloom-Vincenti taxonomy of learning, and Pierce-Gray taxonomy of affective and psychomotor domains, if you care to address the effective and psychomotor domains.

(Refer Slide Time: 08:35)



And how does the course design take place? As course design as we mentioned plays a crucial role in teaching and learning. If you can design your course well following the, what we are calling a specified process, then many other limitations can be overcome if the design is done well.

And a course can be conveniently deigned in an in the framework of ADDIE, and there are many other frameworks which are more or less minor variants of ADDIE. And ADDIE as we said is Analysis Design Development Implement and Evaluate. In the analysis phase the COs are written using the 4 elements Action, Knowledge, Conditions and Criteria. In which conditions and criteria are optional.

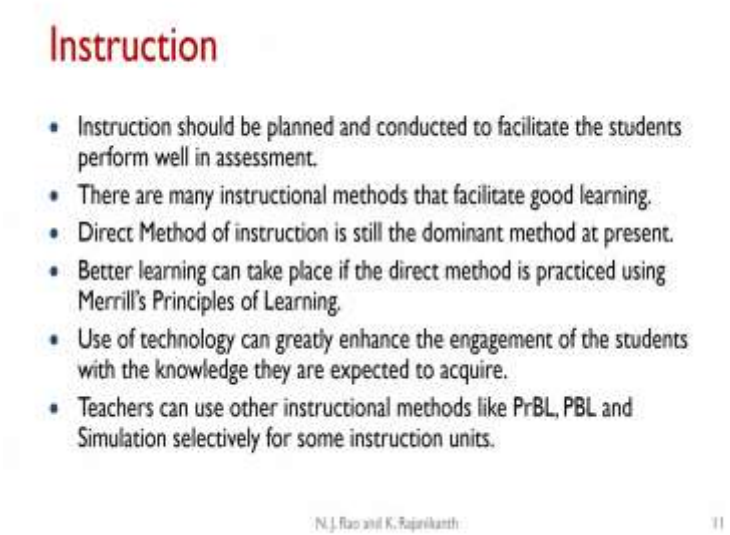
If needed some of the COs are elaborated into competencies. Depending on the scope associated with that particular CO. In the design phase of ADDIE, assessment plans are made and, if possible, test item banks are created.

(Refer Slide Time: 09:57)

And in development phase instruction material is prepared for each instructional unit and learning material is selected or generated. And implement phase requires careful documentation of the specific instance of course delivery.

Remember that each time we offer the course there are some minor variations, so you are capturing in the implement phase through proper documentation specific instance of course delivery. Evaluate phase is used to close the quality loop at the course level, which we have elaborate. So if you design and conduct the course in the framework of ADDIE we will be able to ensure that we can fulfill the requirements of whatever attainment of corresponding COs and through COs the POs and PSOs.

(Refer Slide Time: 10:57)



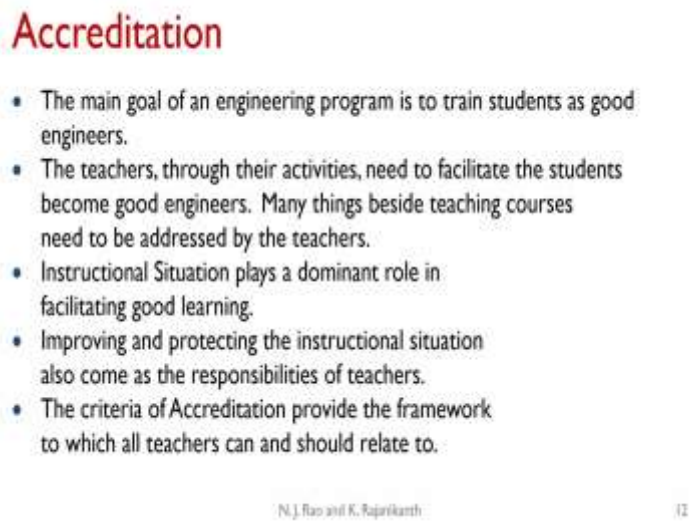
Having identified course outcomes you actually have to instruct. An instruction should be planned and conducted to facilitate the students perform well in assessment. Our goal becomes students doing well in the assessment. And I have to, our instructions should be planned and conducted to facilitate the students to perform well in the assessment. There are many instructional methods that facilitate good learning. And direct method of instruction is still the dominant method at present.

And better learning can take place if the direct method is practiced using Merrill's Principles of Learning which we have elaborated. And use of technology can greatly enhance the engagement of the students with the knowledge they are expected to acquire. So we appeal to the faculty to use the technology as much as possible, as todays students are very comfortable using internet devices, so use of technology from students perspective will not be a major issue.

And teachers need not constrain themselves to only to direct instruction, they can also use other instructional methods like project based learning, problem based learning and simulation and many other things that are possible.

But they can selectively use them in some instructional units. It depends on the available infrastructure as well. You do not have to use the same instructional method for every instructional unit. Some instructional unit can be done using these methods like simulation. Some are can be done by direct instruction method.

(Refer Slide Time: 12:57)



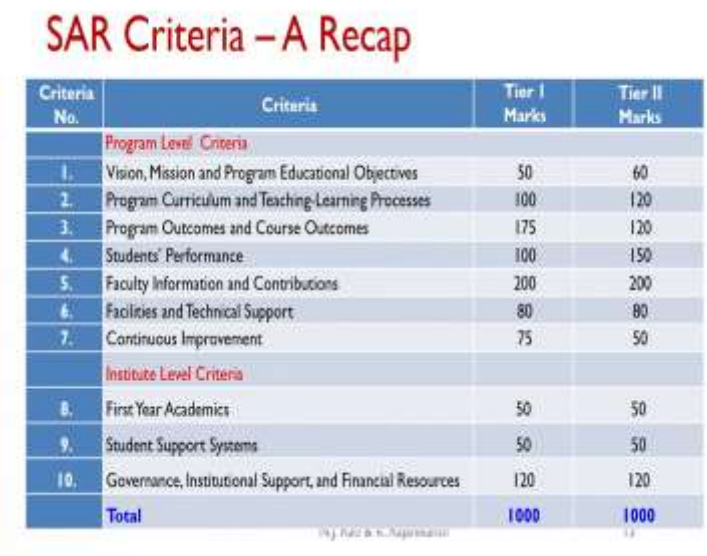
And now coming back to Accreditation, the main goal of an engineering program is to train students as good engineers. The teachers, through their activates need to facilitate the students become good engineers. Many things beside teaching courses need to be addressed by the teachers.

Instructional situation plays a dominant role in facilitating good learning. I keep repeating that instructional situation as we observe in many of the colleges is the major limiting factor. So to that extent, improving and protecting the instructional situation also becomes the responsibility of teachers. They have to guard that the instructional situation is kind of maintained and is not kind of keeps getting deteriorate.

How does it get deteriorated? By unnecessarily adding more and more rules for various activities just because some minor deviation has taken place. So protecting the instructional situation is also the responsibility of the in fact all the stake holders. The criteria of accreditation they provide the framework to which all teachers can and should relate to.

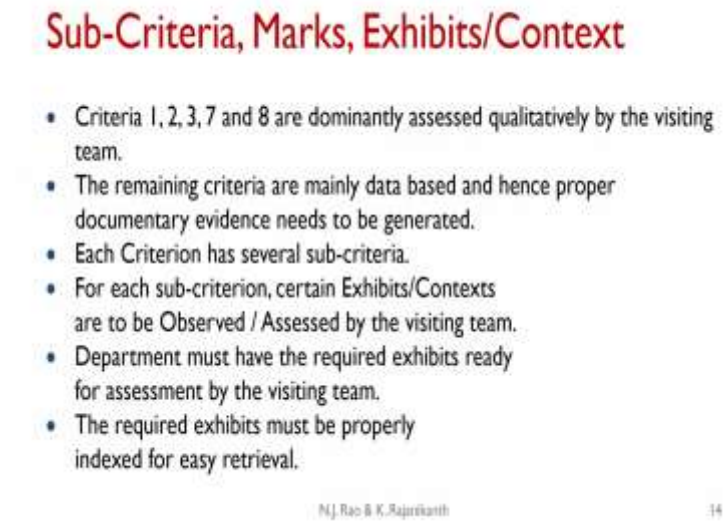
Instead of seeing them as some additional things that need to be done, in my opinion all teachers should start looking accreditation as the framework to which every stake holder in the institute can relate to. Everybody talks in the same language same priorities and so on.

(Refer Slide Time: 14:51)



And these are all the criteria that we have mentioned. There are 10 criteria, there are 7 department level criteria and there are 3 which are institute level criteria. And the marks for Tier 1 and Tier 2 institution slightly differ but the overall marks are the same, 1000 marks.

(Refer Slide Time: 15:15)

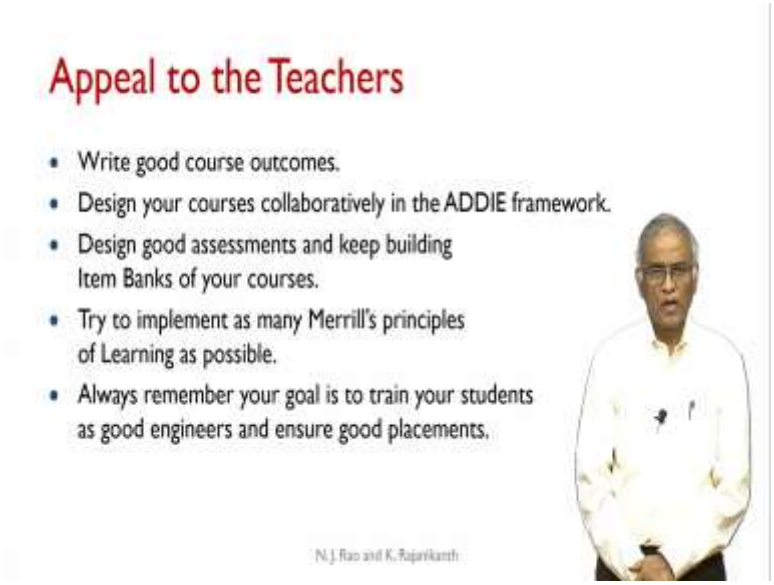


And if you look at criteria 1, 2, 3, 7, and 8 are dominantly assessed qualitatively by the visiting team. The remaining criteria are mainly data based and hence proper documentary evidence needs to be generated. So one should be careful or pay extra attention to create the proper documentary evidence to ensure that you perform well with respect to this criteria. And every

criterion has several sub-criteria. And for each sub-criterion, certain exhibits contexts are also to be observed assessed by the visiting team.

So, the visiting team will assess all this exhibits that you prepare. And department must have the required exhibits ready for assessment by the visiting team. And the required exhibits must be properly indexed for easy retrieval. Today ofcourse if we use any learning management system, they can all be indexed properly and just by click of the mouse the visiting team should be able to have access to any of the material.

(Refer Slide Time: 16:36)



And we appeal to the teachers in summary, please write good course outcomes. Not because they need to be written but write good course outcomes. And preferably design your courses collaboratively in the ADDIE framework. And we find that designing or doing anything collaboratively in teaching and learning really enhances the quality of learning. And design good assessments and keep building item banks of your courses.

Good assessment is the best way to improve the quality of learning. And try to implement as many Merrill's principles of learning as possible. It may or may not be easy to implement all the 5 principles but at least as many Merrill's principles as you can implement them. Always remember your goal is to train your students as good engineers and ensure good placement. That is our appeal to the teachers.

(Refer Slide Time: 17:51)

Thank you very much for participation and wish you happy learning.