Teaching and Learning in General Programs: TALG
Prof. N. J. Rao
Department of Electronics Systems Engineering
Indian Institute of Science, Bangaluru

Lecture – 16
Course Outcomes 2

Greetings and welcome to unit 16 of module 1 on OBE. We continue our presentation on the Course Outcomes. The main purpose of OBE or outcome based education is to first write the outcomes of a course- Course Outcomes, we are presenting a method of writing those course outcomes.

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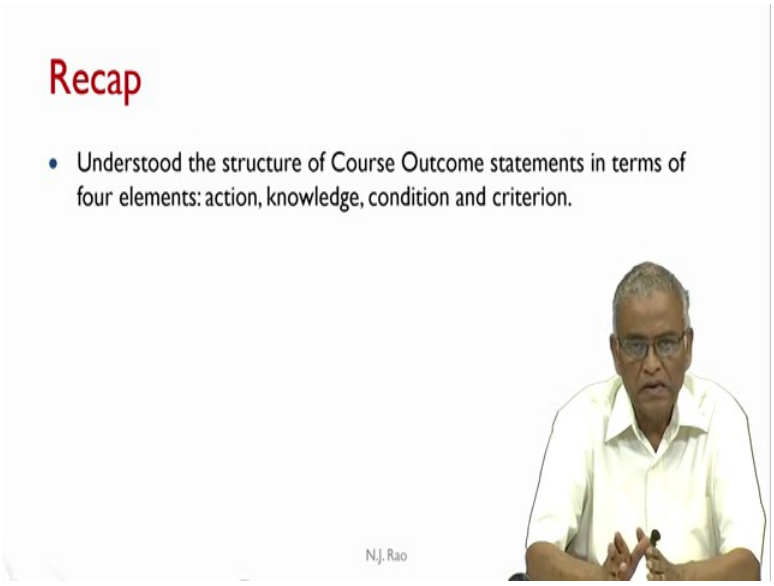

In the previous unit we understood the structure of course outcome statements. And, in terms of four elements; that means, a course outcome statement should have 4 elements with two of them being optional. The first element is action, second element is the knowledge elements on which the cognitive action has to be performed, and the conditions under which this cognitive action has to be performed is expressed as a set of conditions. Acceptance of the performance is defined in terms of the criteria. But, the conditions and criteria are really optional elements they may or may not be present depending on the situation. Essentially course outcome statements have four elements - action and knowledge being compulsory condition and criteria being optional.

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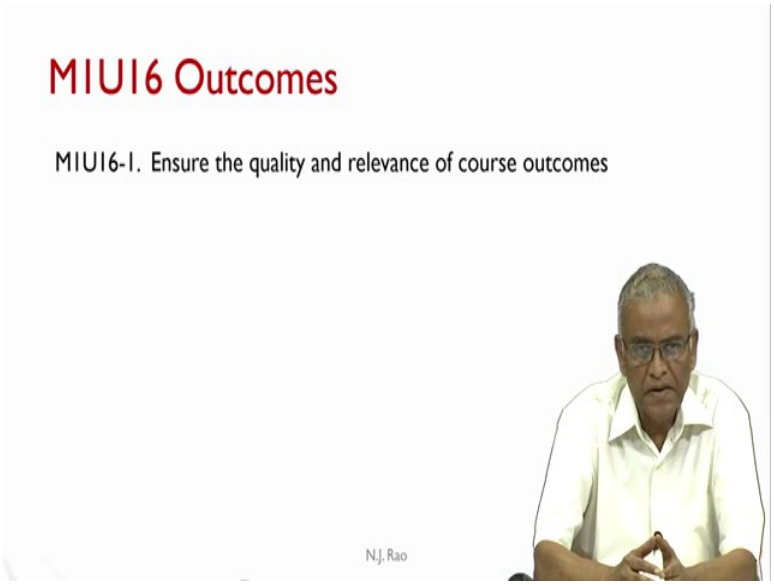

In the current unit, whatever we write as course outcomes, we want to ensure their quality and relevance. How do we do that? Of course, by just looking at the content or list of topics you can write some outcomes, instead of leaving it to chance writing, how do we ensure there is the quality of the outcomes that are written and the relevance of the course outcomes as well?

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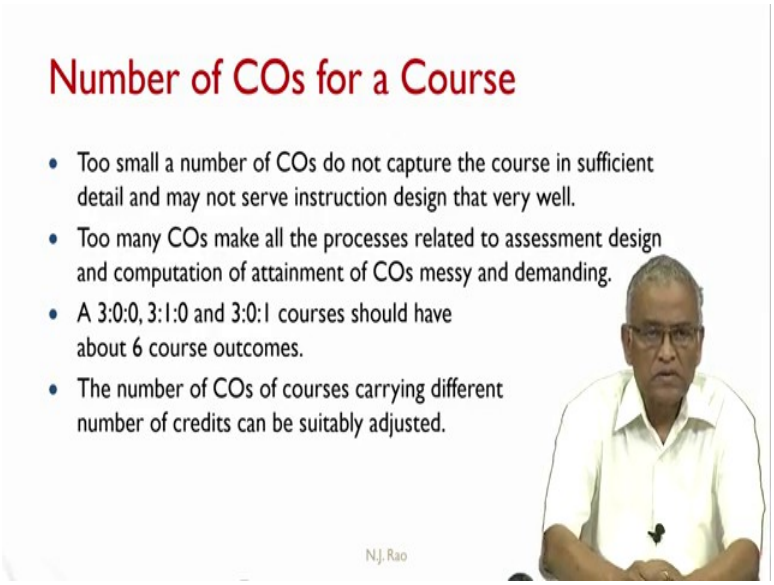

Now, first thing to start with is - how many course outcomes should we have for a course? People have even stated that “one statement - writing the aim of the course is

more than enough", but some people want to write too many of them, what is the optimal number? We propose an argument for that. Too small a number of COs, do not capture the course in sufficient detail and may not serve instruction with design that very well. It should be remembered that we are not writing CO s nearly because we are required to write.

First thing is, we also have to demonstrate that we are attaining these course outcomes and through the course outcomes we are also attaining the outcomes of the program level as well. The other one is the outcome statement serve an excellent way of planning your instruction, your entire semester, how do you want to present things, in what way you want the students to participate in various activities, so that the final learning is really of good quality, which we call as instruction design. The course outcome statements they serve the purpose of instruction design, which we will explore in the in another module itself.

If you do not write enough number of course outcomes it may not really serve much purpose. Broadly writing aim of the course - does not mean much. Are too many COs also is not good. If we have too many COs the processes related to assessment design and computation of attainment will start becoming messy and demanding. So, what is the number? Let us take a course like 3:0:0 or 3:1:0 or even 3:0:1, where the lab is part of the course itself. They should have about 6 course outcomes, 6 would mean, 6 plus or minus 1 or 2. Personally my view is that it should be between 6 and 8.

Of course, nothing happens if you write one more extra or 1 less, as long as you I can convince yourself that you have captured the essence of what you have for that particular course in mind is captured satisfactorily in the outcomes that you have written. It is not only from teachers perspective, the student should be able to understand very clearly, by reading the course outcomes what they are expected to be learning.

It should not be very complicated, it should not be vague and abstract, where the student is not very clear about what he is expected to learn. So, from that perspective around 6 course outcomes is the optimal. If a course carries different credits, for example, in general programs you may have even a course like 5:0:1, or 4:0:2 as per the UGC requirements, so, the number of COs of courses carrying different number of credits can suitably altered. For example, if you have something like 5:1:0 you can even have 10

course outcomes written, because the scope of the course is vastly increased from a 3 credit course.

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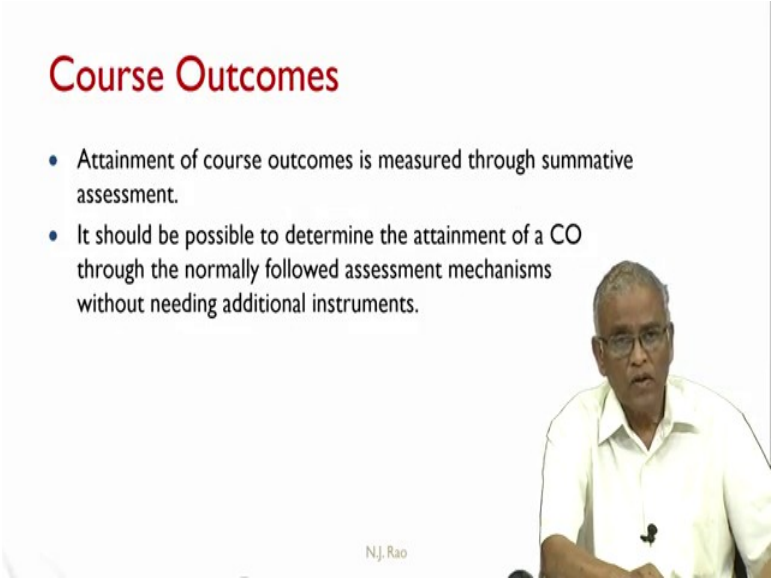

One of the requirements is I should be able to measure to what extent the students have attained this course outcomes, because we do not want to merely write outcomes and leave them there. And, normally this is done through summative assessment -we measure the extent of learning by the student. And, how do we do that? We have standard processes in most of the colleges, where you have some class tests or mid-semester exams, mid-semester tests, you may have 1, 2 or 3 and occasionally you may have some assignments which also carry some marks, so, whole collection of these items. Sometimes in assignments consists of solving the problem, the assignment can consists of student submitting a report (at 2 page 3 page report as specified), that depends on the nature of the course.

And, then you have end semester examination, in colleges affiliated to university, the end semester exam is designed and conducted from a central place, that is the university. In an autonomous institution, the summative assessment at the end of semester is to be designed by the instructor, maybe over seen by some committee or some external evaluator.

Summative assessment consists of CIE, Continuous Internal Evaluation; that is the term that is used all programs offered under UGC and SE Semester and Examination. There is

different weightages given to these two, but both of them are called summative assessment instruments.

Wherever the performance is evaluated and the marks or grades obtained by the student is added to the final marks or the grade they are called summative assessments. What we suggest is we should not be asking for some other kind of instrument to measure the attainment of course outcomes, that will not work because that will mean too much of assessment work, evaluation work, and documentation work. It should be possible to determine the attainment of a CO through the normally followed assessment mechanisms without needing additional instruments. Whatever the mechanism those are presently operative through those mechanisms only we should be able to measure the outcomes of the course.

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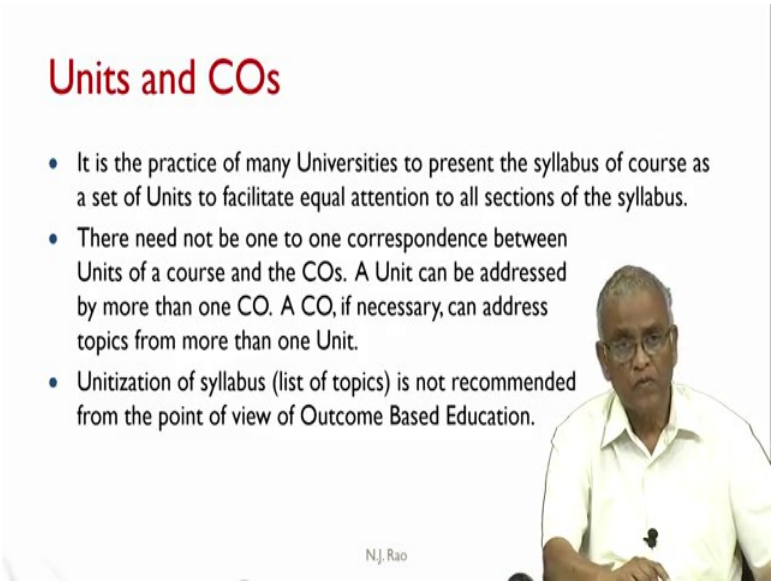

There is another issue; because of the practices till now most the universities are used to a breaking or presenting the syllabus of a course as a set of units. And, these units could be 5 or 6 or 4 and generally same numbers of lectures are associated with these units. This unit structure is academically of no consequence. These are strictly administrative conveniences, that is somewhere the examination says, the first test should focus only on the unit 1 or let us say final exam, when you prepare there should be uniform distribution of marks from the 4 units. So, this is an administrative way of looking at the course itself.

When you come to course outcomes, some people may take a position that let us write one outcome for 1 unit. You cannot object to that, but you cannot legislate that either. Strictly speaking there need not be 1 to 1 correspondence between the units of a course and the course outcomes; because academically it is not required.

A unit can be addressed by more than 1 CO or a CO if necessary can address topics from more than 1 unit. So, there need not be any correspondence between units of a course and the course outcome statements. My personal point of view is unitization of syllabus is not to be recommended from the point of view of outcome based education.

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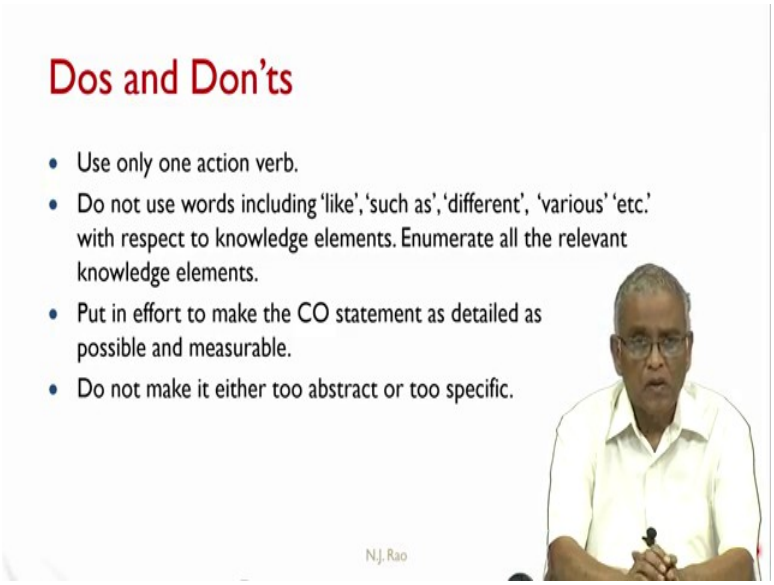

When you write your course outcomes, what are the Dos and Don'ts? First thing is use only one action verb. As stated in the earlier unit, occasionally there could be 2 action verbs, but those should be exceptions rather than routine. Two action verbs should not be used just merely combine two COs into 1 because too many COs have been written.

As started earlier assume the common system – "at the end of the course the student should be able to" - and then start the start your statement of the course outcome with an action verb. Words including 'like', 'such as', 'different', 'various' etcetera with respect to knowledge elements should not be used. Enumerate all the relevant knowledge elements.

As teachers we are quite used to we use the words various, such as, etc., aspects of a course and so on like that. And, when you say ‘such as’; that means, the list is not complete, while teacher is very clear about what ‘such as’ represents, when you write on a piece of paper and communicate to the students; student does not know what other elements you are planning to include. That is the reason why you should not use these words at all in writing an outcome statement and should enumerate all the relevant knowledge elements.

One may say oh it makes the list may become too long, but we found in our experience the number of elements may never exceed 5 or 6. So, just list those 5 or 6 elements (normally, it could be 2 or 3). Now, put in effort to make this CO statement as detailed as possible and measurable. After you write the statement, you should re-read and rewrite, until you make sure it is actually measurable.

And, it is also detailed; when a learner is looking at that statement, it should be clear to him exactly what is it that he should be able to do. Do not make it either too abstract or too specific. Too specific would mean - CO statement may look like, one of the examination/ test questions compute this so and so. It almost looks like a question that you are asking in the examination.

If it is too abstract then also it does not communicate very much. So, these are Dos and Don’ts one should follow while writing course outcome. It may look like why are we making lot of fuss, the whole purpose is learner should clearly understand, should be very clear about what is it that he should learn. And, that is the reason why one has to spend more time or get it reviewed as many times as you can to write good course outcome statements.

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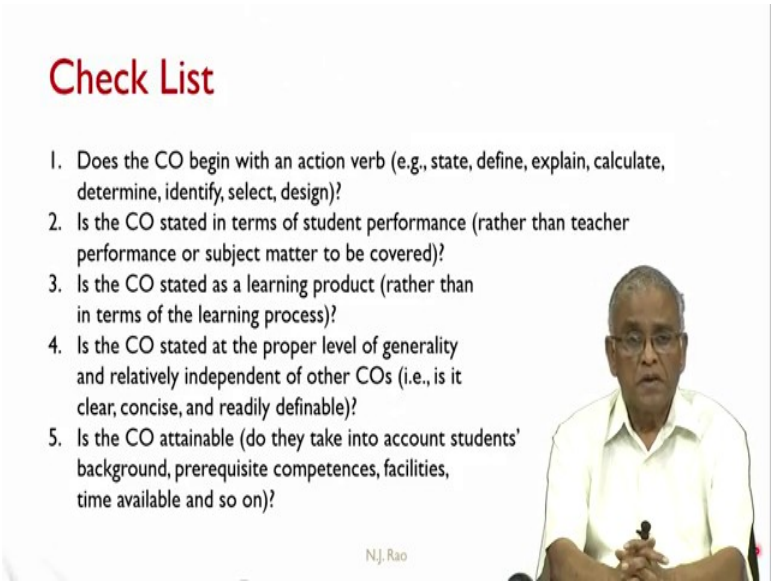

In addition to dos and don'ts we also have a checklist. Checklist would mean, after writing this statement go through these fives statements and make sure you satisfy the requirement, Does the CO begin with an action verb? If it does not then we will say it is not a CO statement. What kind of action verbs do use? They can be from any of the 6 cognitive levels like, we have already presented to your several action verbs, state, define, explain, calculate, identify, select, design and so on from various cognitive levels.

Is the CO s stated in terms of student performance rather than the teacher performance or subject matter to be covered? CO should not merely list the topics that need to be covered. Nor what does teacher want to do. It should be strictly in terms of the student performance, you should always remember the initial stem, 'what the student should be able to do?' Is this CO stated as a learning product rather than in terms of learning process?

This is a common mistake one does. Many times teachers write the process first and then sometimes the product; sometimes they may miss the product. Example; you should use these principles: that become process, but what exactly the student should be able to do? So, first part of the CO should be the learning product and then if you want you can say the learning process, which may get translated as a condition under which the learning product has to be produced. And, this is part of Dos and Don'ts as well; is the CO stated the proper level of generality and relatively independent of other COs?

it also is possible that 2 COs may overlap a little bit in their scope, that should be avoided. Not only that is it should presented at the proper level of generality; that means, it should not be too abstract and it should not be too specific. And next thing is the CO attainable first? For example, particular CO may not be attainable either because of the background of the students or they do not have prerequisite competencies, they do not have the required facilities nor time available and so, on.

So, what can happen is, if you just look at some website and find an interesting CO which is very good, but if you just incorporate it in to your course, it may not be attainable because of all these conditions. So, there is no point in writing such a CO just it is good and looks good. This is the checklist that one needs to follow to make sure that you are able to write good course outcome statements.

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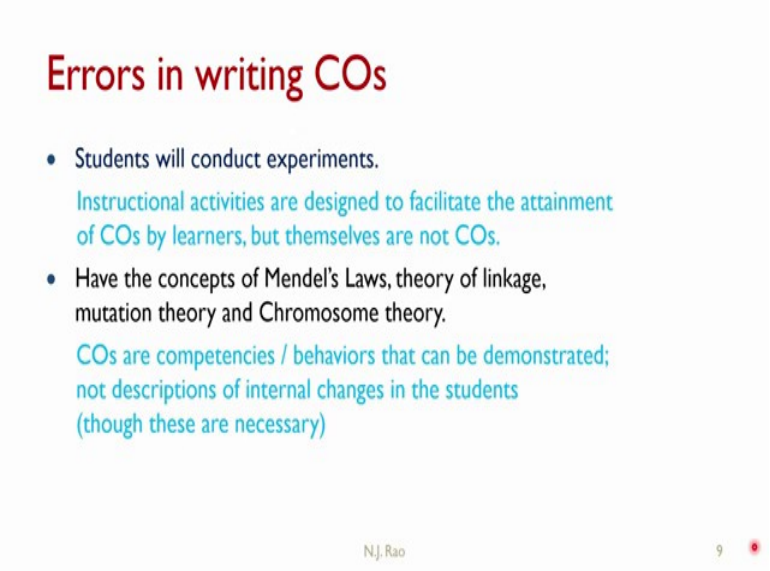

We will present an outcome statement, we request you to take about 30 seconds time to find out what is the error in that. You think about the outcome statement and if you are able to find the error it is fine, otherwise we will also present what is the error in that.

We will have about 10 CO statements for you to consider where in either some Do's and Don'ts are not properly followed or does not satisfy the items in the checklist. So, let us start with one statement; 'students will conduct experiments'. This is an instructional activity, their designed to facilitate attainment of COs by learners, but they themselves are not COs. So, this is a process statement rather than an outcome statement.

Next statement: 'Have the concepts of Mendel's Laws, theory of linkage, mutation theory and Chromosome theory'. COs here are generally competencies or behaviours that can be demonstrated, but to have concepts requires internal changes in the students. while such changes are required to happen; they themselves cannot be measured directly. For example, the fact that they have to understand the concepts of these laws should be demonstratable. So, the statement should be modified to something that is demonstratable or measurable. So, this is not a CO because it being an internal change, and it cannot be measured.

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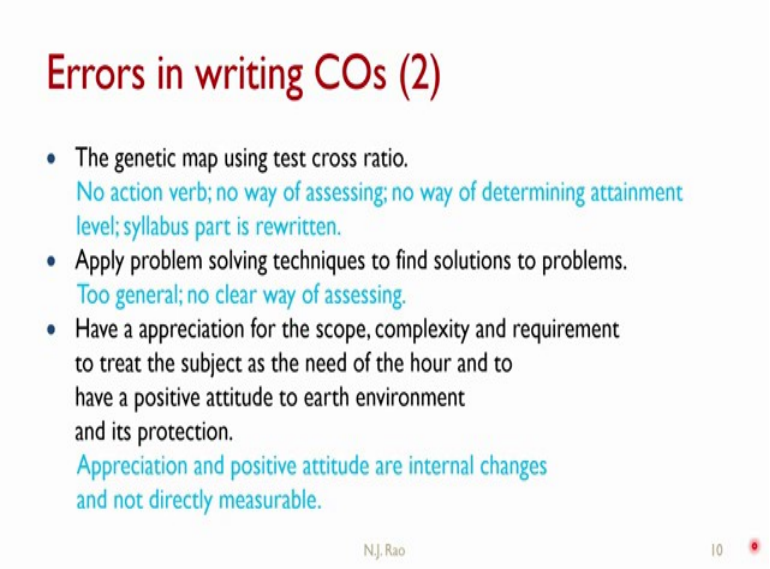

Next one is 'genetic map using the test cross ratio'. First of all there is no action verb, there is no way of knowing what is it that you are accessing; no way of determining the attainment level. Essentially it is a topic from the syllabus taken and presented as a CO. And, this is generally an error that is committed by many first time faculty members when they write the course outcomes.

'Apply problem solving techniques to find solutions to problems'. This is not a CO that is written just work presentation here, all the statements we are presenting, actually were written by some faculty members in some workshops that we participated. Apply problem solving techniques to find solutions to problems is too general and we do not even know what kind of course, it is applicable and how do you measure? It is too general and no clear way of assessing.

‘Have an appreciation for the scope complexity and requirements to treat the subject as the need of the hour and to have a positive attitude to earth environment and it is protection’. First of all there are 2 parts to the statement, as you can see have an appreciation is one part and second part you have a positive attitude. Even if you consider have as an action verb, first of all there are 2 action verbs. Then appreciation and positive attitude once again are internal changes and they are not directly measurable.

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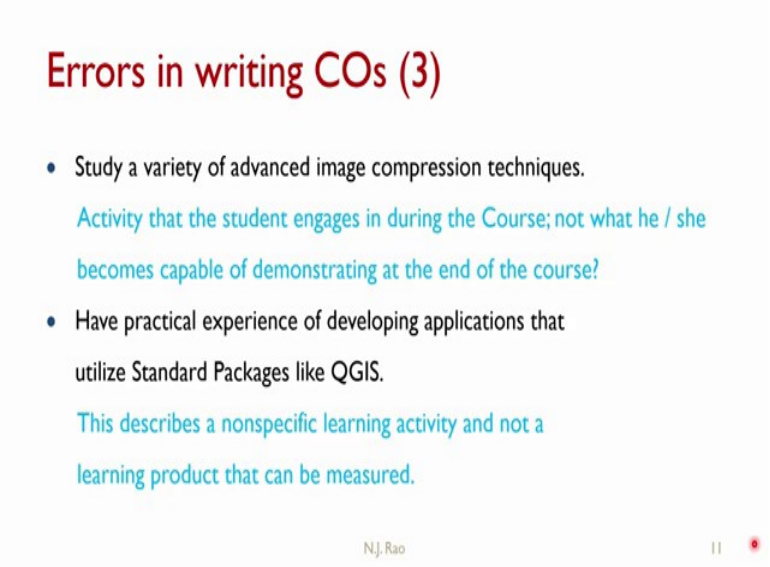

‘Study a variety of advanced image compression techniques.’ ‘study’ is not an acceptable action verb. Merely studying, we do not know what exactly the student has achieved and what he is capable of demonstrating at the end of the course. First of all what are these advanced image compression techniques, do you have a list? They should be enumerated? And having enumerated what do you want to do with those things? Merely understand what those techniques or what do they perform or you actually perform advanced compression techniques are not clear from the CO statement.

‘Have practical experience of developing applications that utilise Standard Packages like QGIS.’ Once again this describes non-specific learning activity, but not a learning product that can be measured. Have practical experience - that is all that you are trying to say, but experience of developing applications - what applications, what are the specifications of that? None of that is very clear from here.

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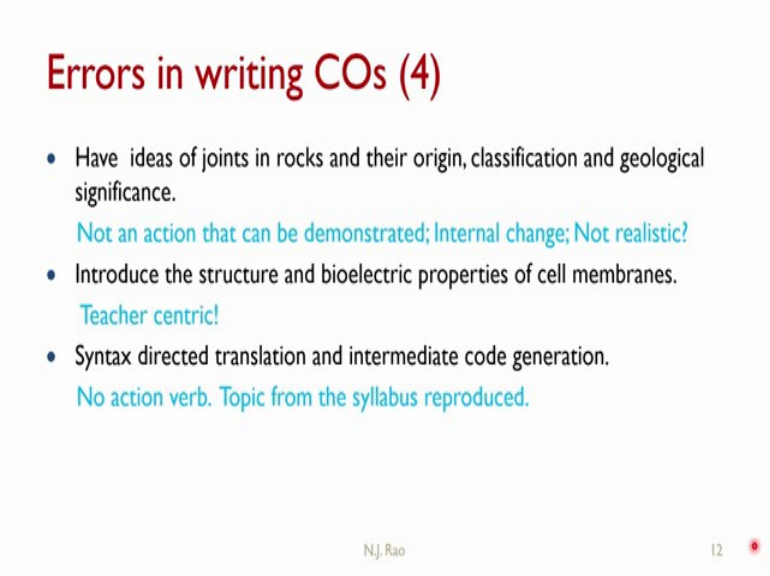

'Have ideas of joints in rocks and their origin classification and geological significance.' First of all there is no action verb that can be demonstrated. Have is an internal change and not a realistic CO.

'Introduce the structure and bioelectric properties of cell membranes'. It is teacher centric; who introduces structure and bioelectric properties is a teacher, but what should the student do? That is not very clear from this CO. Once again the teacher centric way of looking at things is somehow very deeply ingrained and every faculty member is likely to commit this error while writing the COs. So, one has to warn himself or herself.

'Syntax directed translation and inter intermediate code generation.' There is no action verb and topic from the syllabus is reproduced, that is how the syllabus gets written.

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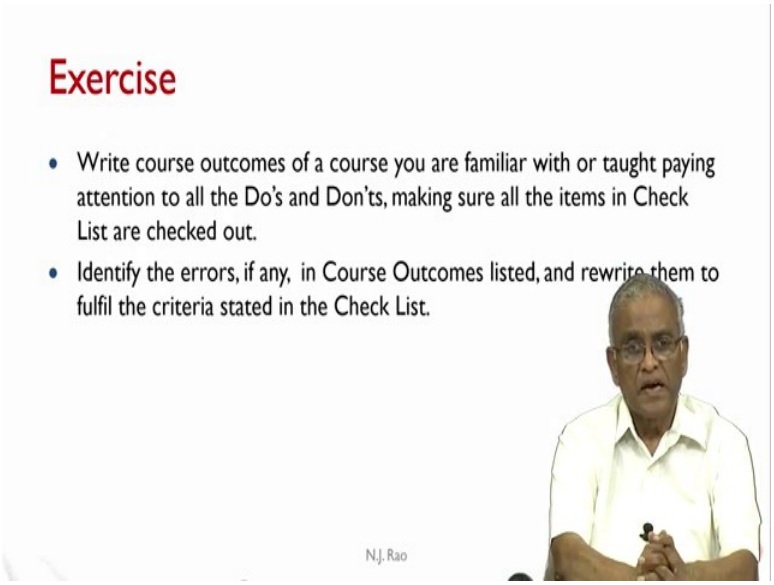

As an exercise; write course outcomes of a course you are familiar with are taught, paying attention to all the do's and don'ts, making sure all the items in checklist are checked out.

Once you do that, you can do this in jointly with colleague/s of yours or otherwise it is generally good to discuss with somebody else. And, we will continue whatever you have written in the next unit by tagging them appropriately. And, also identify the errors if any in course outcomes listed and rewrite them to full fill the criteria stated in the checklist.

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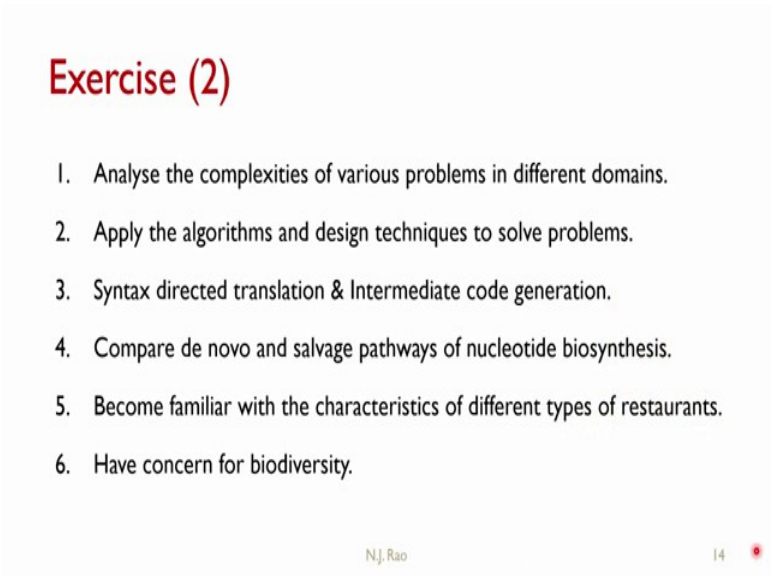

So, we are going to give a set of outcomes like this and we request you to identify the errors in this and reword them.

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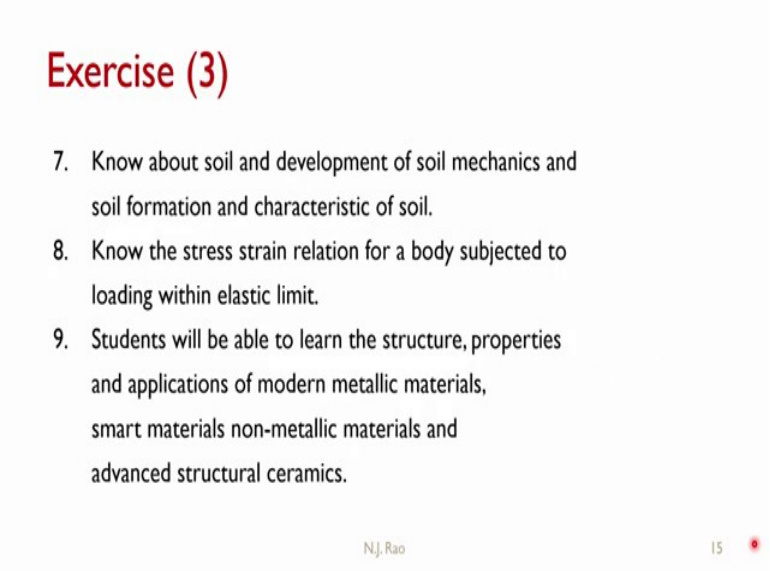

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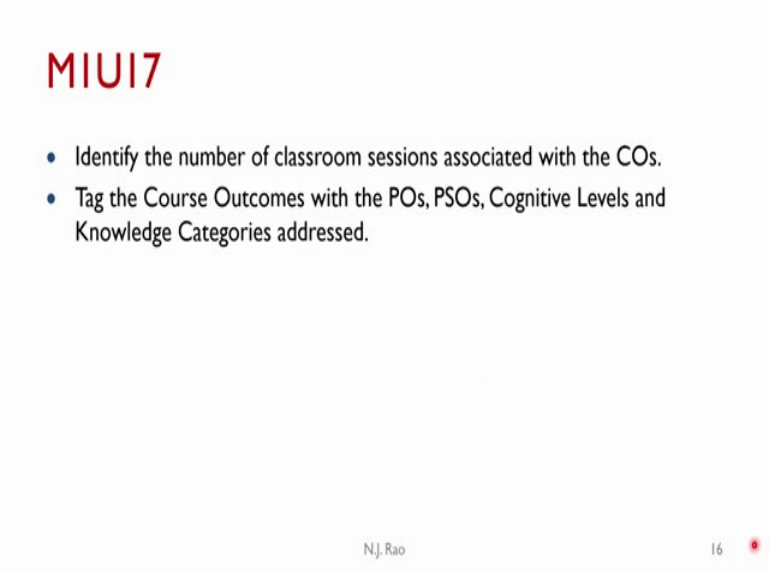

And, in the following unit, we will continue with our writing course outcomes. We identify the number of class sessions associated with the given COs and then we tag. The course outcomes are the main means by which the POs and PSOs are to be attained. So, tag the course outcomes with the POs, PSOs, cognitive levels, knowledge category

addressed, besides the number of classroom sessions. That will be the aim of the next unit.

Thank you very much for your attention.