Teaching and Learning in General programs (TALG)
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Lecture - 19
Attainment of POs and PSOs

Greetings and welcome to the last unit of this module 1 of TALG and this unit is the 19th unit. It is related to the Attainment of Program Outcomes and Program Specific Outcomes.

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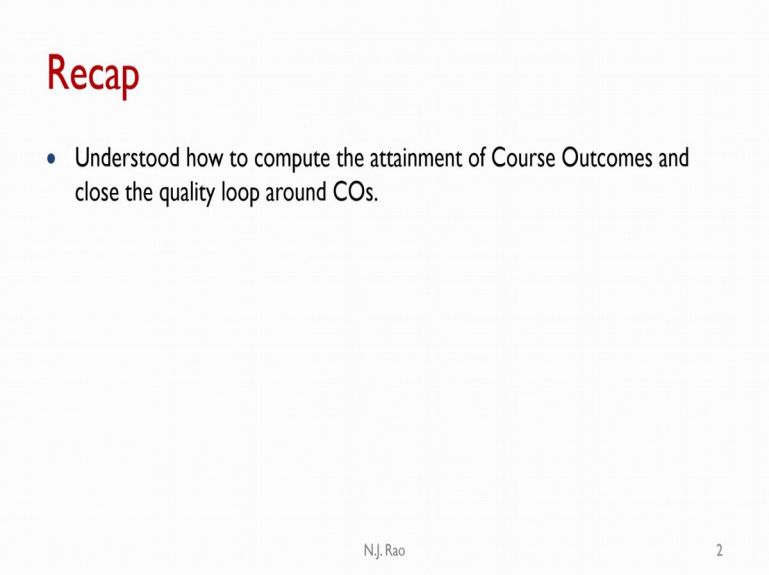

In the earlier unit we understood how to compute the attainment of course, outcomes and close the quality loop around COs. Once again we should remind there is no the way of computing attainment of COs some reasonable method can be chosen and stay with that method consistently. And the purpose of doing this to somehow to prove to ourselves and to the all the stakeholders that we are continuously improving that is a main purpose of closing the loop quality loop.

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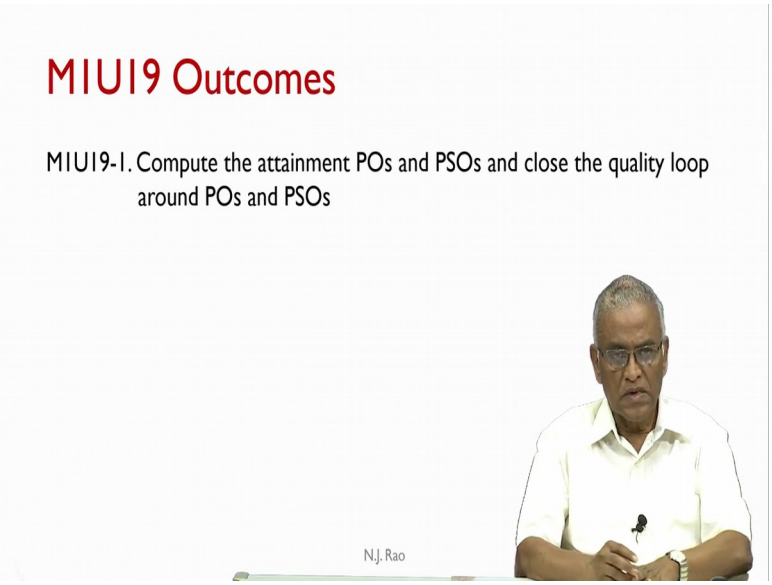

And in this unit we look at the computing of attainment of POs and PSOs and close the quality loop around POs and PSOs, that is the main purpose of this unit.

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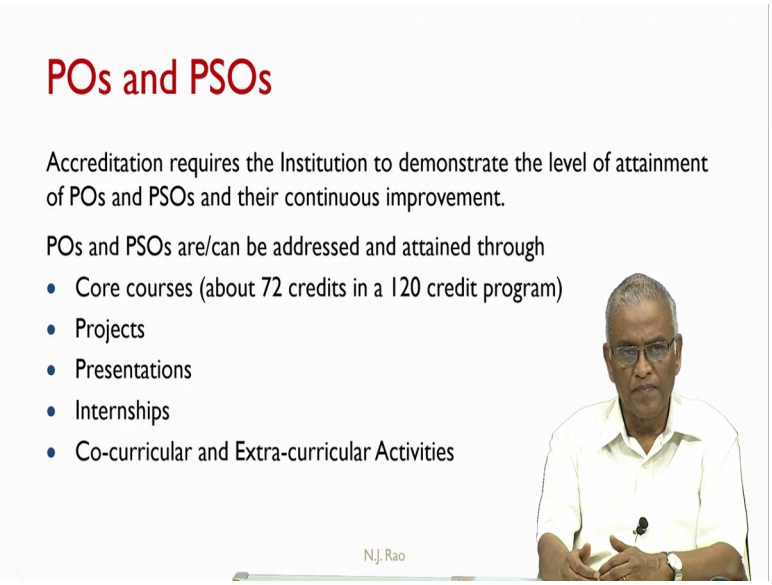

Now, let us look at the accreditation requires that the institution to demonstrate the level of attainment of POs and PSOs and their continuous improvement. That means, you take one batch of students generally in general programs you have undergraduate level you have a 3 year program from one batch to the other you are improving the performance of the students; that means, you are putting efforts to improve the performance of the student.

So, what happens as a POs and PSOs only we can look at after a batch of students complete their 3 year program. So, you have to compute the POs and PSOs over a period of 3 years in the sense 3 year program and the students performance in all courses and activities should be integrated together to find out to what extent the POs and PSOs are addressed and retained. So, you must have to show improvement you must have data over 4 years or that is two batches have actually graduated and this is the requirement.

You cannot just compute for one course and say immediately talk about the PO PSO attainment. And to that extent as it is over a batch of students the responsibility of the entire department comes in when you are talking about attainment of POs and PSOs through one course you cannot just attain all the POs and PSOs. And another issue is POs and PSOs can be addressed and retained through core courses; core courses means they are all compulsory courses all students of the batch will have to take the core courses and as per the current UGC norm 72 credits in a 120 credit program constitute the core courses.

A university may slightly deviate from that, but cannot deviate significantly from this. And projects may or may not be compulsory for all students, but we have to take only the activities that are done by all the students. You cannot say some; so only some students do the projects some do not in such case it does not qualify to be used to compute attainment of POs and PSOs. Other activities could be presentations, internship, CO curricular and extracurricular activities.

One cardinal rule is whatever that you take as an activity to attain a PO or PSO it should be done by all the students and all this like presentations, internship, co-curricular, extracurricular activities, you must have a method of measuring the performance of the students in those activities. You cannot say he has done internship and just write one sentence that will not do, you have to have some kind of measurement of the performance of the student in the internship.

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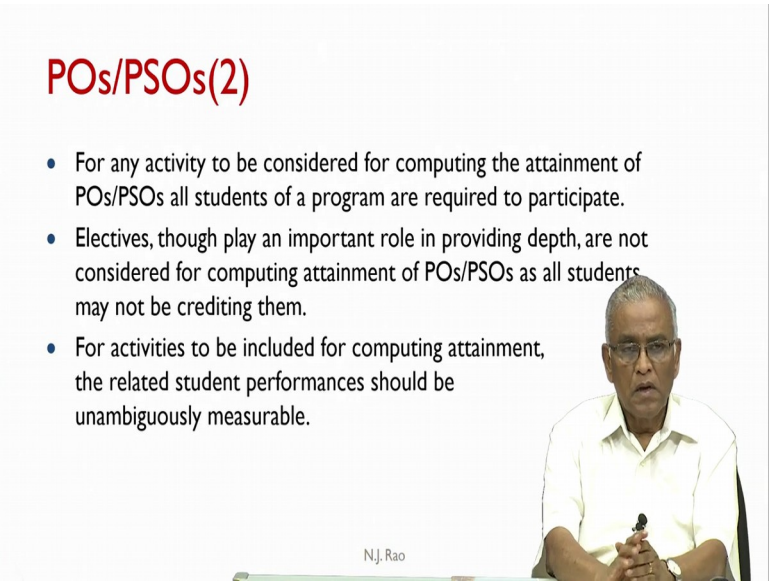

Now, what about the electives; electives are also they constitute an important part and they do play an important role, but what happens is they are not included in computing the POs and PSOs.

Many times we find the departments or faculty feel very unhappy that they are not included ok. So, if they are not included in computing the PO PSO attainment it does not mean they are not important they serve their purpose. But as far as attainment computation is concerned we do not take those courses into consideration, that is what we mean by what do you call one need not feel very bad that it is not included in the computing the attainment.

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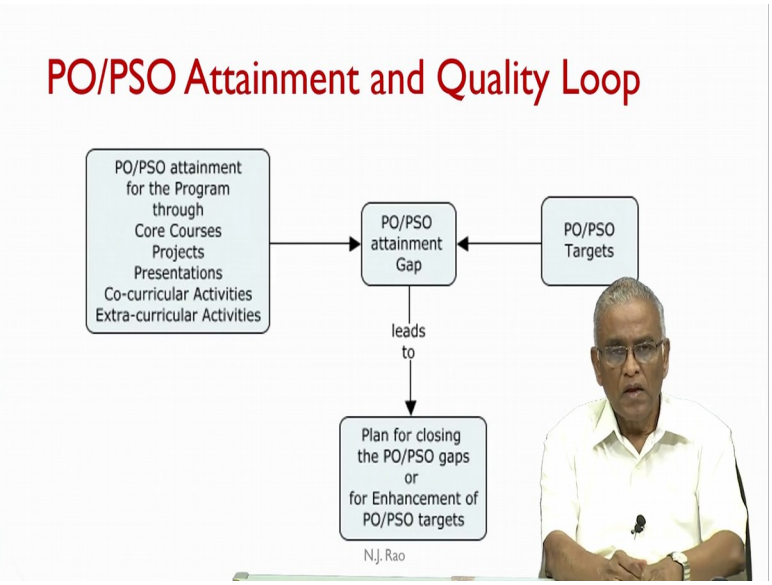

Now, here also the quality loop we draw it a slightly differently. So, PO PSO attainment for the program through core courses projects presentations CO curricular activities and extracurricular activities, that is compared with PO PSO targets. And then you compute the PO PSO attainment gap, and that should lead to plan for closing the PO PSO gap or for enhancement of the PO PSO targets that is the same method that we followed for COs.

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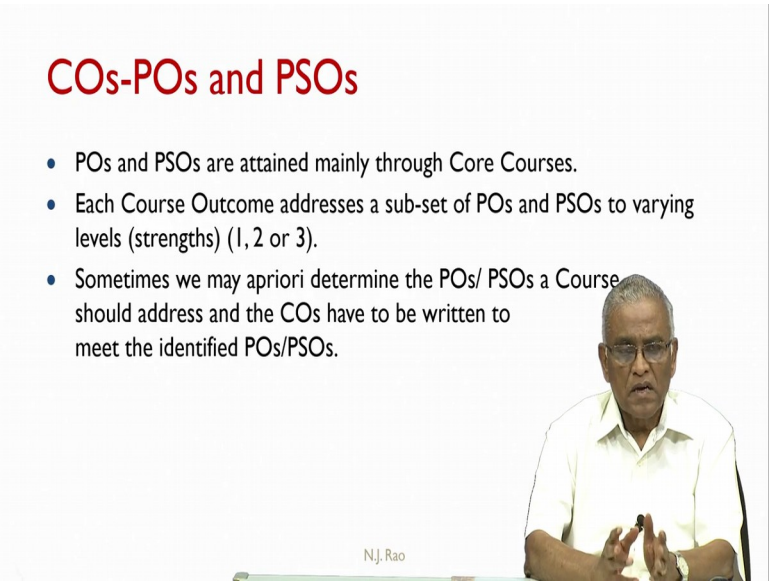

Let us say we have looked at we tagged each course outcome with POs and PSOs and we also said a CO can only address a subset of POs and PSOs. Now, just because one CO briefly which takes only two classroom sessions is addressing some PO 5; obviously, it is not the same thing as all COs addressing a particular PO ok. So, what happens we introduce the another word called strength to what extent to what strength am I addressing a particular PO or PSO; it may be important, but still to what strength do I address this.

This is one part which is again it is a little subjective decision, but the decision should be taken at the institute level rather than or not in fact, even at department level it should be taken at the institution level. And occasionally we may that is we write COs and then determine what POs it addresses, occasionally we may want a particular CO to address a pre specified PO or PSO that also can happen the reason for that we will explain little later when we prepare the final table.

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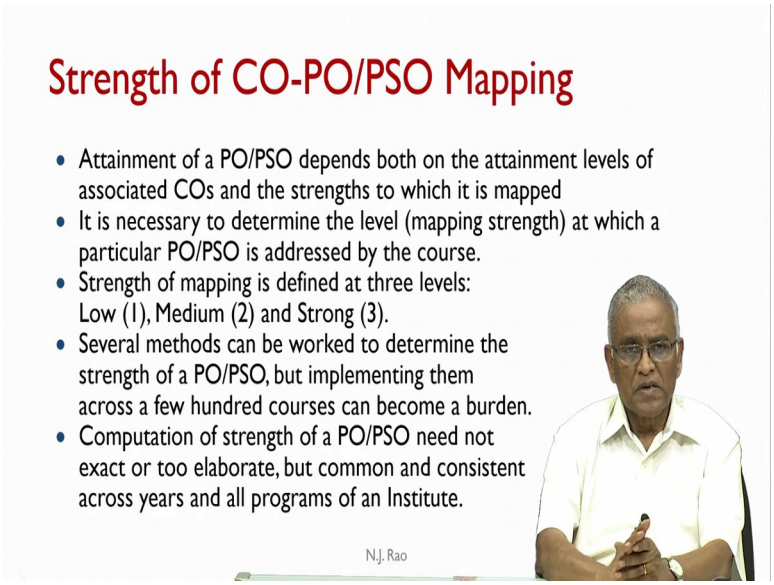

Now, attainment of PO PSO depends both on the attainment levels of associated COs and the strengths to which it is mapped ok. There are two parameters; one is whether a PO is associated with the CO or not and the strength to which it is mapped.

So, we have to find a method of a determining the strength. The strength is again is only what do you call it is not a too finel mechanism it is fairly gross we only identify 3 levels low, medium and strong instead of or you can use the word 1, 2, 3 ins. As we are

computing all the time we will use the numbers 1, 2, 3 rather than low medium and strong. And as we said again how do we because it is a qualitative approach how do we measure the strength to which it is addressed and here again you have to be careful.

You should not make it too trivial not too elaborate, but some kind of a justifiable to outside world you have to choose a mechanism of that type. And it should be the same across all programs and across all the years of your for example, computation as we said to demonstrate that you are continuously improving you have to have at least four years of data.

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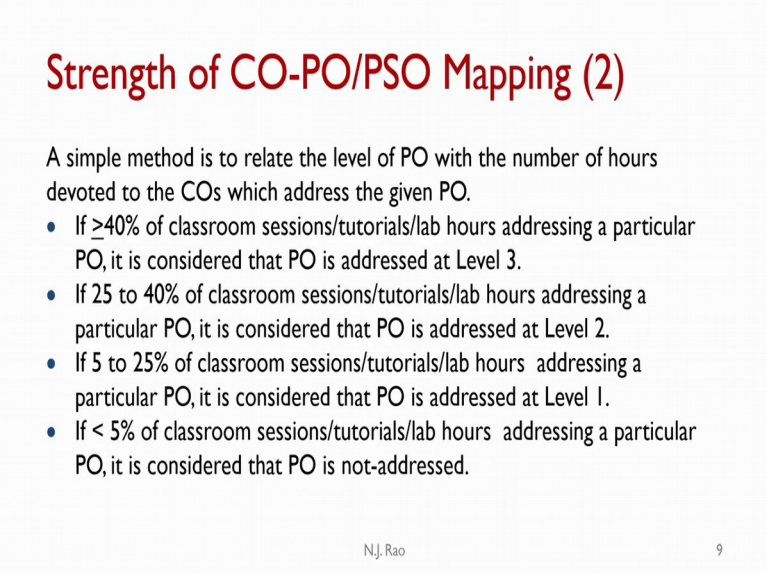

Now, we propose a simple method to relate the level of PO with the number of hours devoted to the CO which addresses the given PO the logic is this. If let us say one CO is addressing PO 1, but that CO I only take 2 hours.

So; obviously, even though I am addressing this PO I am only dealing with the scope of that address is limited to 2 hours. But in another case I have a CO which addresses same some PO 2, but the number of classroom hours associated with the 7; that means, I am spending more time through CO in addressing that particular PO. So, this is what the basic logic is. If we propose, if greater than or equal to 40 percent of the classroom sessions, tutorials, lab hours addressing a particular PO, it is considered that PO is addressed at the level of 3.

If you do not like 40 percent, you can make it 50 percent, you can make it 60 percent as you wish. If 25 to 40 percent of the classroom sessions a tutorials, lab hours addressing a particular PO it is considered that PO is address at level 2. If 5 to 25 percent of classroom sessions tutorials or lab hours 5 a particular PO, it is considered that PO addressed level 1 and anything less than 5 percent of the class sessions it is nominally mentioned, but you are only spending less than 5 percent, then we consider that PO is not addressed at all.

So, this is as I said is a subjective proposal, this proposal can be considered by the institute or the university and suitably modified to reflect your thinking of the strength of addressing a given PO.

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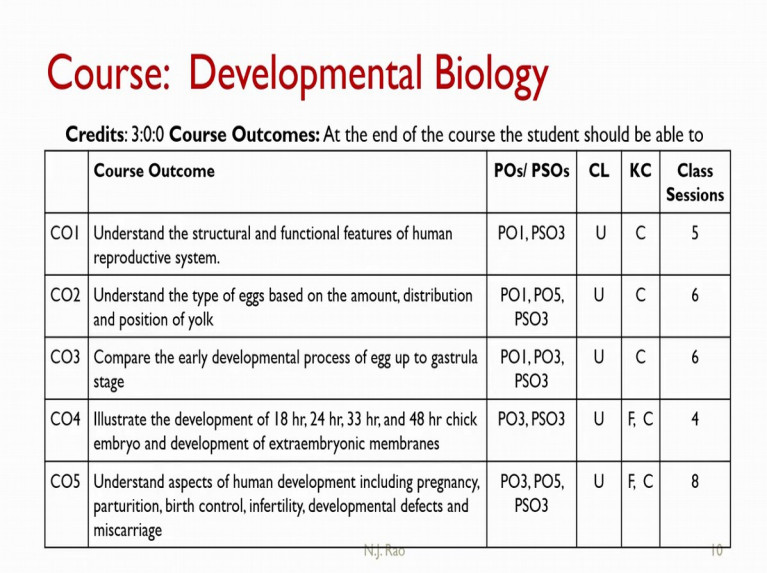

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions
CO1	Understand the structural and functional features of human reproductive system.	PO1, PSO3	U	C	5
CO2	Understand the type of eggs based on the amount, distribution and position of yolk	PO1, PO5, PSO3	U	C	6
CO3	Compare the early developmental process of egg up to gastrula stage	PO1, PO3, PSO3	U	C	6
CO4	Illustrate the development of 18 hr, 24 hr, 33 hr, and 48 hr chick embryo and development of extraembryonic membranes	PO3, PSO3	U	F, C	4
CO5	Understand aspects of human development including pregnancy, parturition, birth control, infertility, developmental defects and miscarriage	PO3, PO5, PSO3	U	F, C	8

Now, once again the developmental biology is same course we are taking, we are now putting all the numbers here and the course description is given here.

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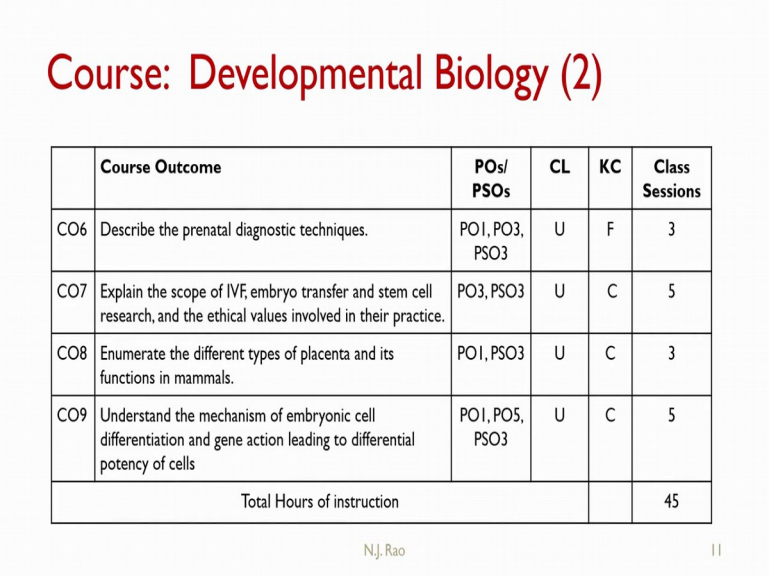

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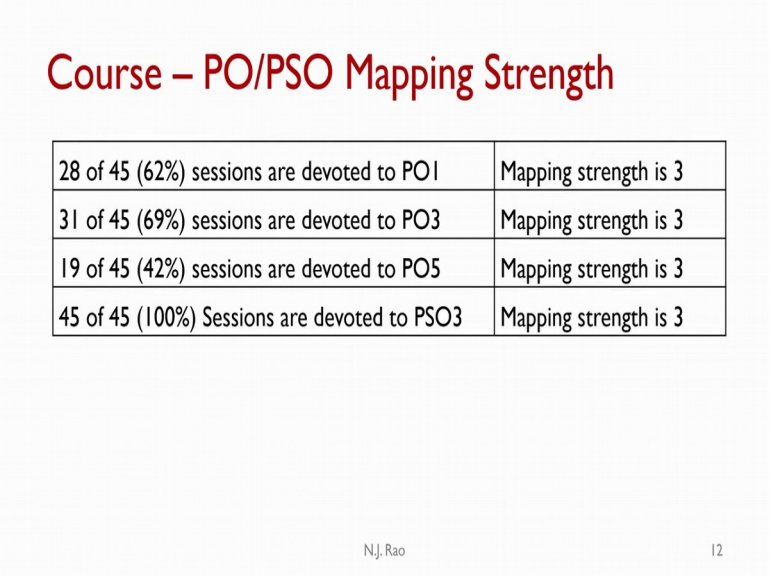

And now if you count with respect to the number of hours associated with PO where PO1 appears like 28 out of the 45 sessions total are 45 if I count all the sessions where PO1 is mentioned, it will add up to 28 out of the 45 sessions and that is 62 percent and so it is more than 40 percent. So, it is mapping strength is 3.

Now, as far as PO3 is concerned 31 out of 45 which still makes it 69 percent which is mapping strength 3. In that sense even PO5 and PSO3 are all addressed to mapping

strength 3 which is a specific instance here, but it need not be so, that all the POs will not get addressed to the strength of 3.

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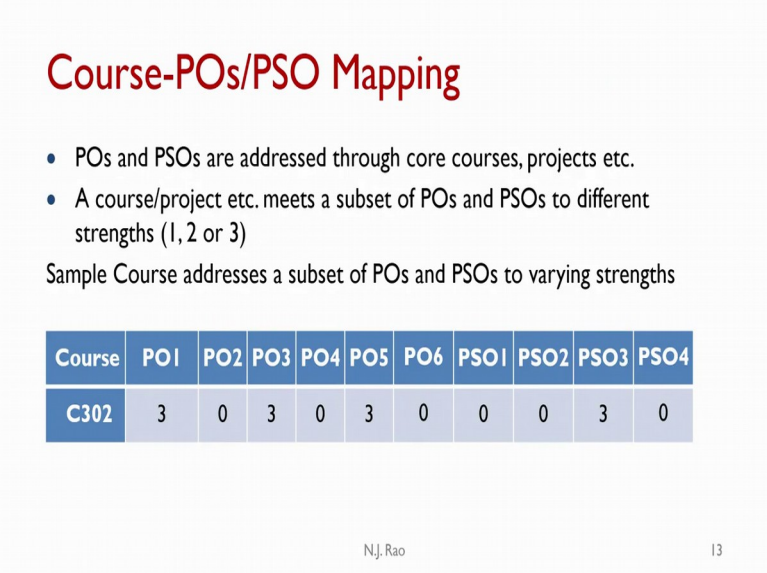

Now, what happens? We prepare a kind of a table we mentioned already, we are tentatively taking in this example 6 POs, but if it is 7 POs you add one more column that is all and then there are maxim possible four PSOs and this is how we prepare the table where PO2, PO4, PO6, PSO1, PSO2 and PSO4 are not addressed at all. So, that strength will be 0. So, it is 3 0 3 like that you prepare a kind of you can call it course PO PSO mapping is a matrix of that type.

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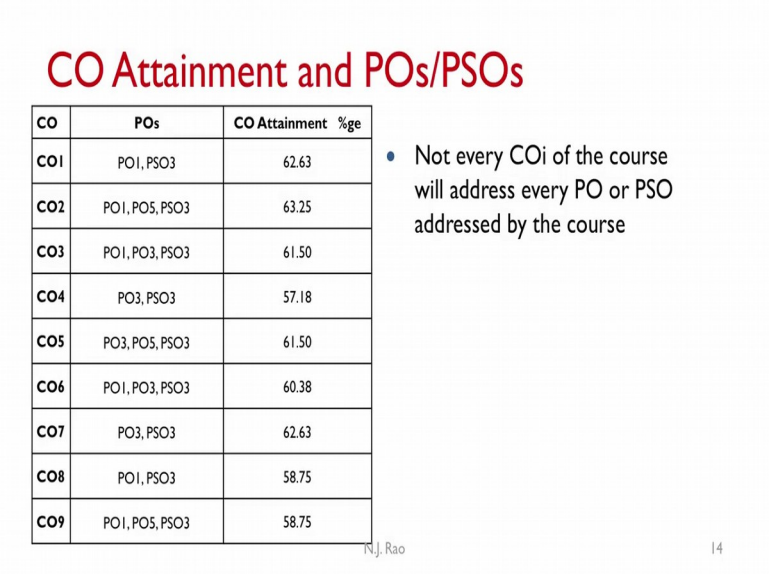

Now, what happens CO1 is addressing PO1 and PSO3, that CO attainment is 62.63 that we have already calculated in the previous unit the attainment is 62.63 and the associated POs and PSOs are indicated in this table. So, now, you can see I can somehow associate the CO attainment to corresponding POs and PSOs. How do I do that?

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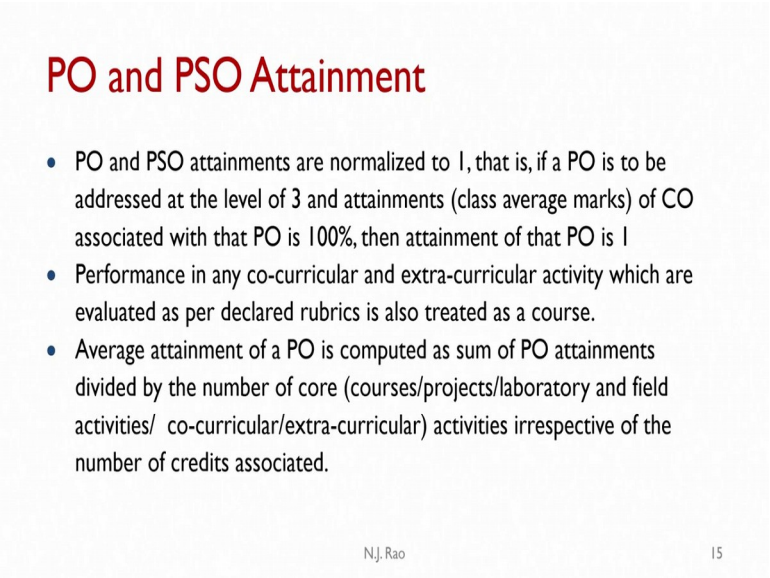

We define we need to define something like PO or PSO attainment to some norm I can call it a 100 percent or I can just merely say 1, it does not matter to what is the norm that you would take the maxim that you take. Now, how do you define if I consider

attainment maxim attainment of a particular PO is 1, under what conditions do I consider that? If a PO is to be addressed at the level 3 and the attainments are that this class average marks of CO associated with that PO; of all COs associated with that PO is 100 percentage; that means, class average marks are 100 percent then the attainment of that PO is 1 which is not likely to happen. However; obviously, class average marks will never be 100 percentage.

And also performance in any CO curricular and extracurricular activities which are evaluated as per declared rules can also be treated as a course. And another thing that we would like to point out when we calculate finally, the PO PSO attainment we are not going to differentiate between a four credit course 3 credit course, 2 credit course and so on, we do not have to again weigh add that extra weightage to that.

We will just say all courses are similar and we just compute an average they divide the total attainment by the number of course's that we actually have or number of not only courses number of activities like project to presentation CO curricular extracurricular each activity I will treat it as if it is a course and then divide the total PO attainment by that number that that is the way we will work it out. As I said it is very gross. But what is of importance is that according to that criterion that we are improving continuously.

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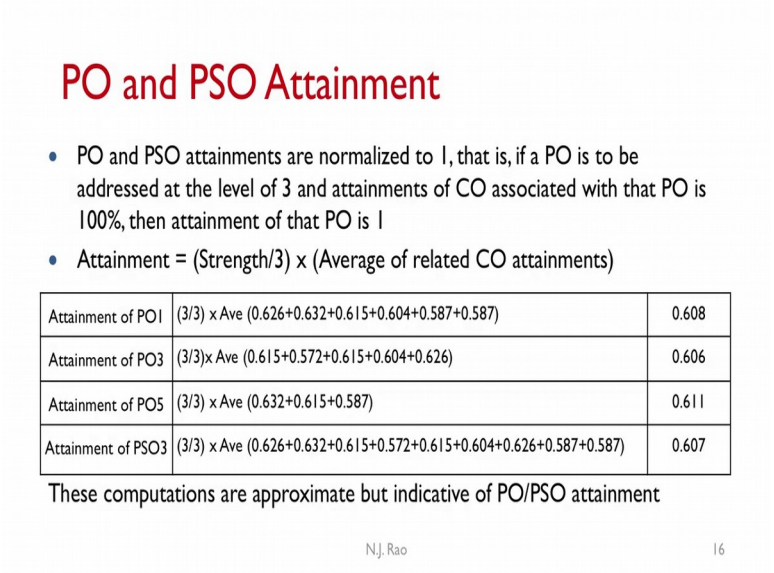

Now, how do I compute? The attainment is computed. Let us assume there are 5 COs that are addressing PO1 are here there are 5 COs that are addressing the PO1. So, the CO

attainments numbers are given there I take an average of that, average of 0.625 plus 0.632 and so on I compute the that average and multiply by the strength because the maxim strength is 3 the actual strength is 3. So, I multiplied by 3 by 3 and that is the number that I get.

So, attainment of PO one according to this is 0.608 whereas, the attainment of PO 5 there are only 3 COs that are dealing which are addressing PO 5, but the strength is still 3. So, what do I have 3 by 3 into average of those 3 numbers I get 0.611 whereas, PSO 3 all of them are addressing. So, I have again 3 by 3 into average of all of that and I get 0.610. See what you require to be is a consistent with one process and you get some numbers you do not have to as I said keep on going for higher decimal places approximate numbers are and this is what you get of PO and PSO attainment.

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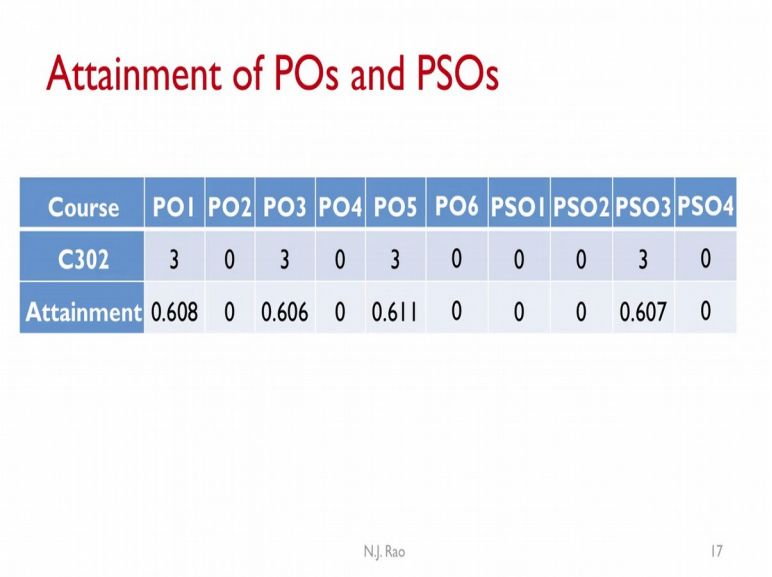

Now, the if you with respect to this course which tentatively we label it as C302 the strength to which each PO is addressed is given there and the actual attainment is computed in the in the bottom row that is what you have for this is for one course. Now, you have to collect this information for all the courses and all the activities of the program.

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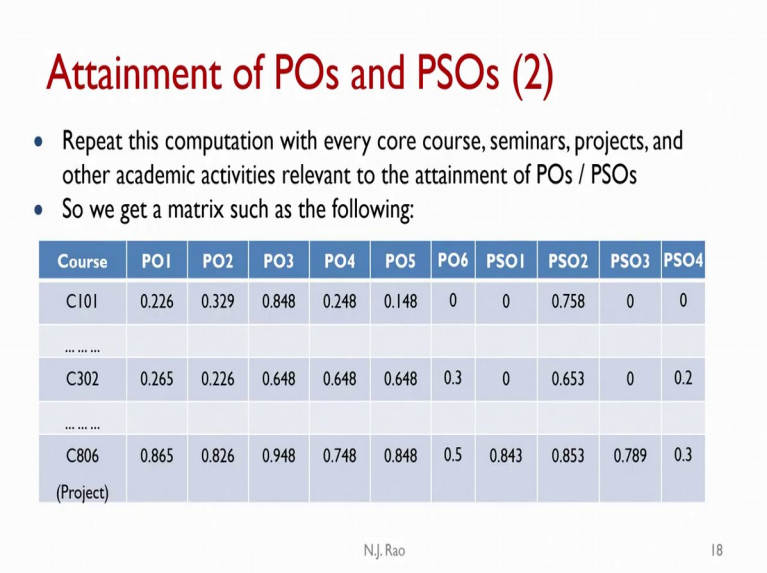

So, you have to repeat this for all the courses, these computations can be done automatically at the end of each semester after the exams are over, collect all the marks and it is easier to kind of a integrate it together like this ok.

So, these are the for example, we combined together and put all the courses into this together. For example, you will have something like about 20 25 courses in a 3 year program and for each course you have one row like this of attainment.

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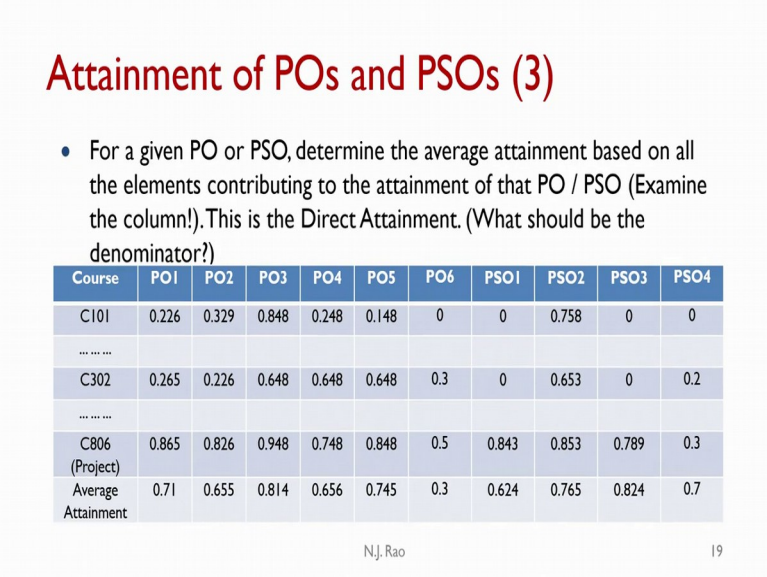

And as I said the project internship all of them are added to this list and then what do you do? You take now; take the average with respect to each column and divide by the number of activities and courses that you have and the bottom row represents the average attainment of all the POs; POs and PSOs. And here there is something that you need to this is also the direct attainment of the POs and PSOs. Sometimes what happens is the way our program is addressed we may or may not address certain PO that very dominantly, it may be done very lightly.

While that is the input to the curricul designers to address that particular issue, but one need not feel bad if the numbers let us for example, PO 6 the average is 0.3 its it does not matter as long as you can show you are improving from here to here ok. So, finally, the PO and PSO attainments are computed in this form and by looking at this overall matrix that you can see it is a kind of a picture of how your program is has been designed and conducted with respect to the POs and PSOs. And if certain columns are either have too many zeros or vary small value it is a kind of feedback to the or to the entire department that some attention needs to be paid to those issues that is what it means.

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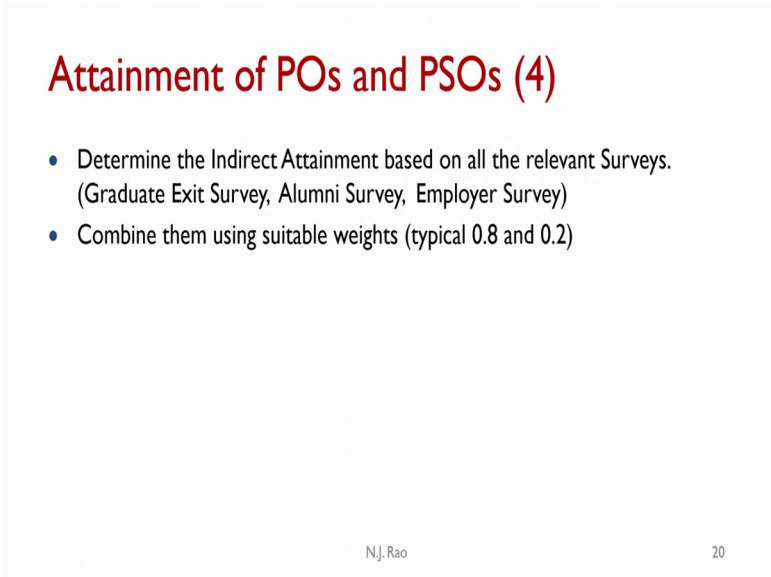

Now, we also we determine the indirect attainment based on all the relevant surveys; surveys could be graduate exit survey; that means, when the students are just leaving the program you conduct a survey aluminized survey, employer survey these forms can be designed and actually get the information from that. And this indirect attainment should

be combined with direct attainment a typically you take the 80 percent weightage to the direct attainment and about 20 percent weightage to this and combined together you produce the final picture of the PO PSO attainment.

Until we streamline the processes it looks very laborious and difficult and complicated, but once you streamline the process including the alumni survey employer survey these days one can setup websites and keep constant touch with alumni and employers and of course, employer and alumni they will not everyone will not answer even 10 percent of them will answer those questionnaires that is quite adequate.

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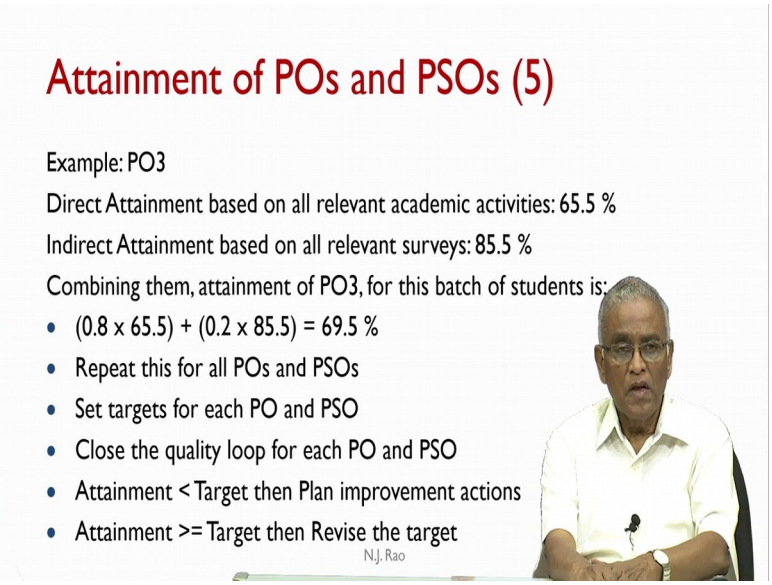

Now, let us take an example; example PO3, it is some PO3 because PO3 will be it has to be addressed by all by quite a few courses. Direct attainment on all relevant academic activities it is 65.5 percent.

Indirect attainment based on all relevant surveys is 85.5 percent. I combined the two 0.8 into 65.5 plus 0.2 into 85.5 I get 69.5. Now, you have to repeat this for all POs and PSOs. And once again you set the target; this target now as we said a maxim number is 1 I can set my target as for a particular PO as 7.6 or sometimes 7.2 also does not matter one. You set the your target for that and if attainment is less than the target then plan improvement actions, attainment is greater than or equal to target then revise the target the same process that we followed for computing or for closing the loop around the COs.

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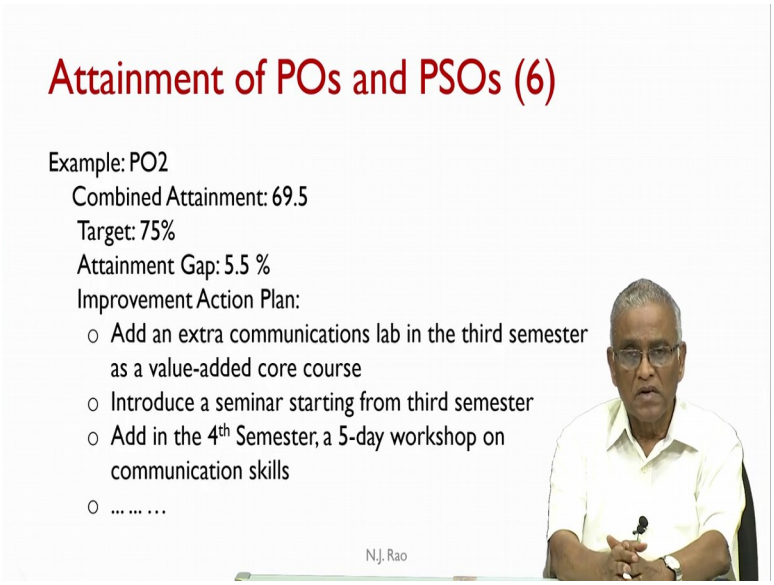

Now, here instead of tabular form we are giving on specific thing the PO2 combine attainment is 69.5, target is 75 percent we call it 0.75, then attainment gap is 5.5 percent and improvement action plan. Here you should remember PO2 is going to be addressed by a number of courses. So, all the improvement actions do not take place through one course, it happens through several courses. So, here just we give a list add an extra communications lab in the third semester has value added core course introduce a seminar starting from third semester add in the 4th semester, a 5 day workshop on communication skills because here PO2 is related to communication.

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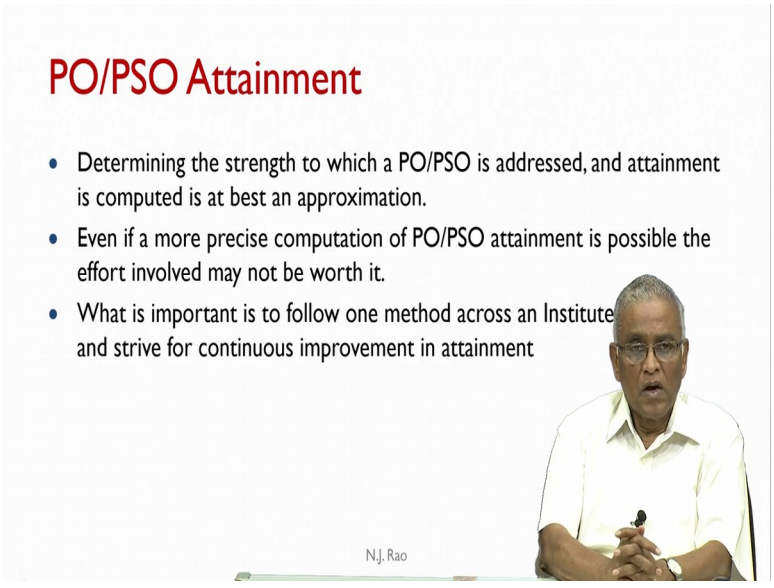

So, this is how we use the, we compute PO attainment and plan for improvement of that attainment. We are repeating repeatedly using this as making this statement, the attainment computation is at best an approximation whatever process you people will choose in your institute, whatever we presented is at best an approximation. Even if more precise computation is possible the effort involved may not be worth it, it is not going to throw any extra light on the on anything. What is important is to follow one method across an institute and strive for continuous improvement in attainment; that is what we is the most important part.

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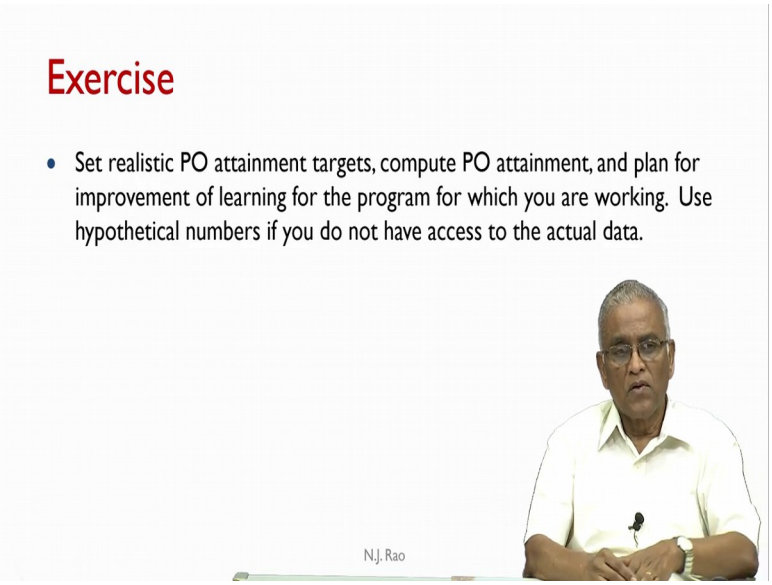

Now, as an exercise some set realistic PO attainment targets compute PO attainment using hypothetical numbers and plan for improvement of learning for the program for which you are working. Use if you have actual numbers from the department we can use our hypothetical numbers you can use to understand the mechanisms involved in that.

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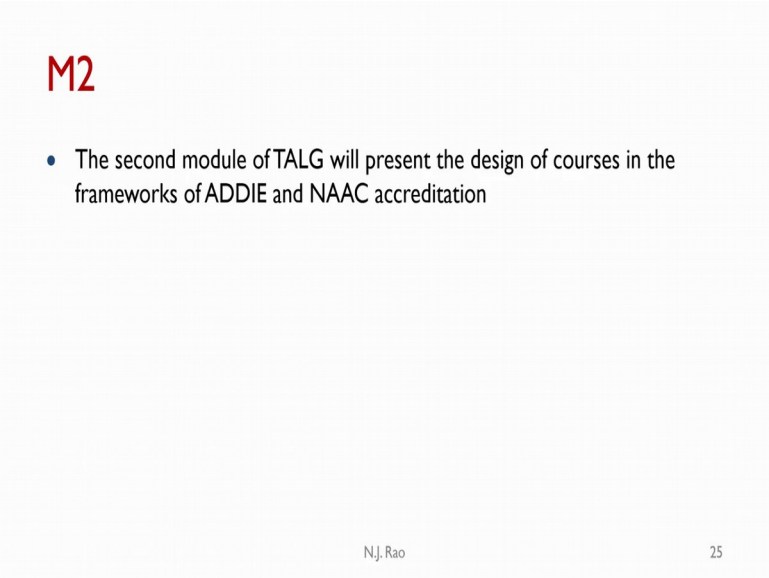

That will bring us to the end of module 1 or what we are calling it OBE and this will be followed hopefully by module 2, and module 2 will of TALG will present the design of courses in the framework of ADDIE and NAAC accreditation. The main thing is writing course outcomes and knowing how to compute attainment of course outcomes and POs is the first step. Unless it is translated into designing your course and conducting your course appropriately, the whole thing does not have any meaning just writing outcomes and leaving it there does not mean anything.

Now, how do we translate from course outcomes to designing a good course and implement a good course is the concern of module 2. Hopefully we will all meet again through the module 2 and.

Thank you very much and wish you all happy learning.