Teaching and Learning in General Programs (TALG)

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Lecture – 15
Course Outcomes 1

Greetings and welcome to unit 15 of module 1 of TALG. This unit is related to writing course outcomes. And this is the goal of this entire module on outcome based education.

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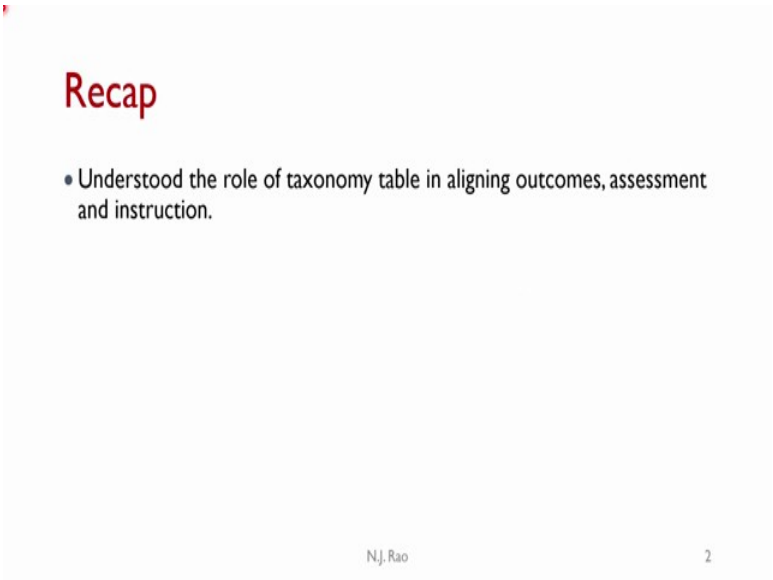

In the earlier unit, we understood the role of taxonomy table in aligning outcomes, assessment and instruction. In all our discussions about the nature of outcome, assessment and instruction, we were trying to talk in terms of the cells of taxonomy table and the address of the cell.

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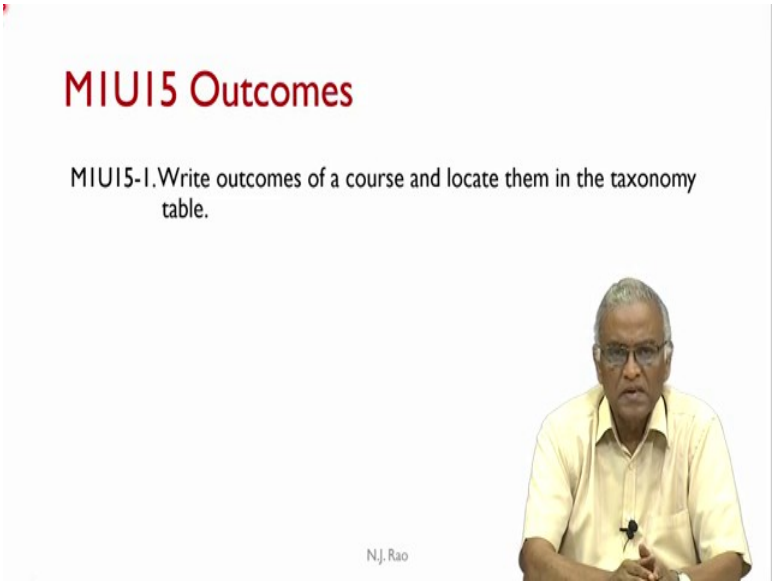

In this unit we write outcomes of a course and locate them in the taxonomy table. We write an outcome and in writing the outcome, we will try to follow some structured method and having written we will try to locate them in the taxonomy table.

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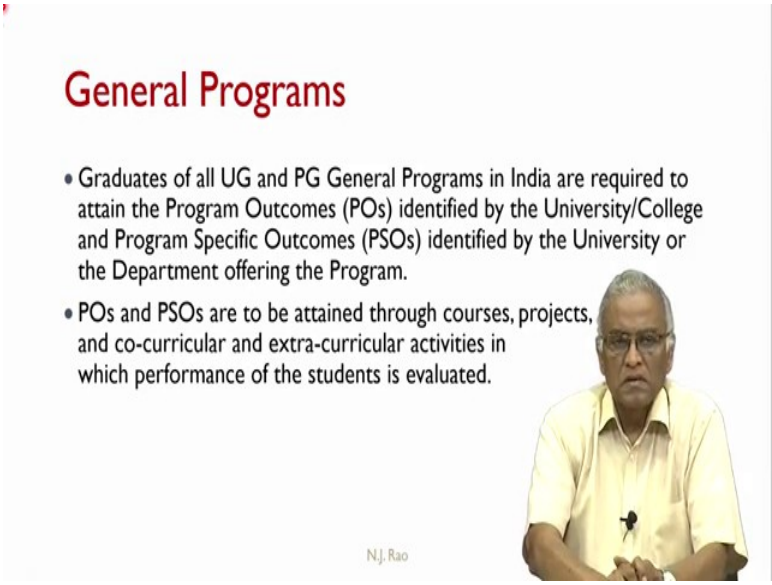

We are talking now of course outcomes of a course; that means, we are talking of courses; which are elements of a program. So, any course that you look at, one should remember that course cannot be considered or seen in isolation from the other courses of the program.

BA in economics is a program, it is an entity. There are several courses which are included in the program BA economics, but the program itself has very specified program outcomes and programs specific outcomes. So, any single course in a program cannot be seen in isolation from the others.

So, if you talk about graduates of all undergraduate and PG general programs in India are required to attain program outcomes identified by the university and if it is an autonomous institution, then by the college itself and programs specific outcomes identified by the university or the department (or department would mean generally like board of studies) offering the program

How do we attain these POs and PSOs? They are mainly attained through courses; sometimes there could be a project; which is not compulsory in all programs and some co-curricular and extracurricular activities. These are the only means that we have in terms of attaining the outcomes. But one thing that should be remembered is when we are talking about attainment of POs and PSOs, whatever we are trying to attain something should be done by all the students in the program.

For example, you will have some courses which are electives. Electives would mean that some students are not taking that particular course by the very definition of that. Same thing with respect to co-curricular and extracurricular activities, all students will not participate in the same activity. Which course to be addressed which not, will be addressed later.

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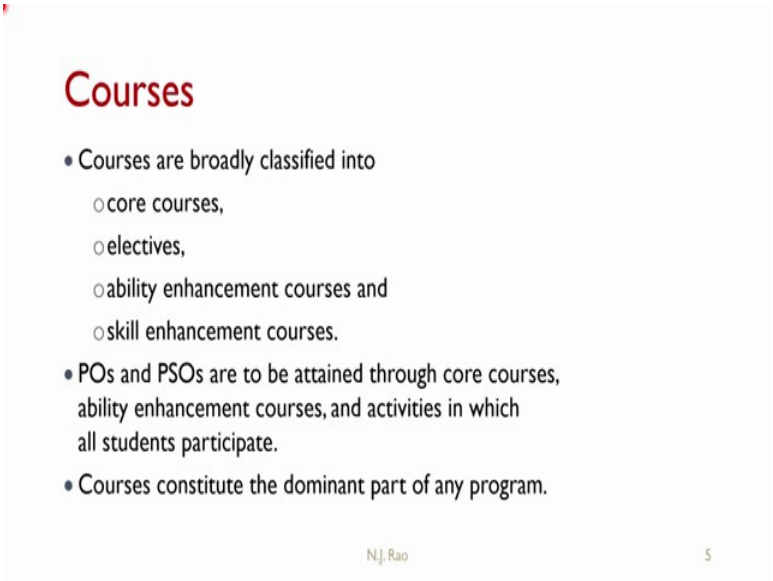

Coming to the courses; courses are broadly classified as per the current UGC terminology as core courses, electives. Core courses means all students take these courses. And electives; is taken only by some students. There are ability enhancement courses and skill enhancement courses. This is the terminology presently used by UGC. Ability enhancement courses are compulsory for all students. But skill enhancement courses are to be treated as electives; as every student will not take every skill enhancement course.

POs and PSOs are to be attained through core courses, ability enhancement courses and activities in which all students participate. They could be co-curricular and extracurricular activities, but only those activities where all students participate can be considered. And when you look at this, the courses constitute the dominant part of any program in terms of credits or in terms of the amount of time both teachers and students spend, the courses constitute the dominant part of any UG or even PG programs.

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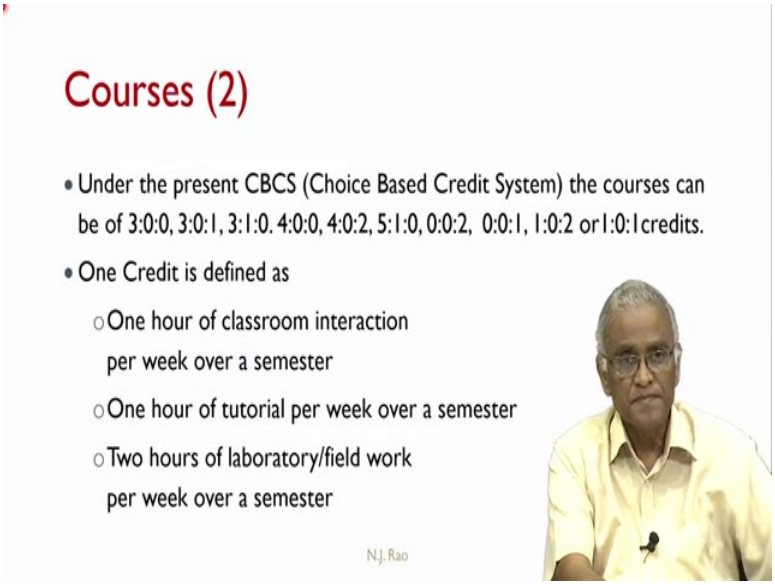

Under the present CBCS- Choice Based Credit System; the courses can be of many types. That is one of the natures of credit system, it can be a 3: 0: 0; what does it mean? There are 3 classroom sessions per week over a semester. Next digit corresponds to a number of hours tutorial and the third digit corresponds to number of credits per week over a semester. You can have all kinds of combination, a pure theory course can be 3:0:0 or it could be 3:0:1. What it means is you have three credits for theory the classroom interactions and one credit for laboratory. 3:1:0; it means 3 hours of classroom activity, but 1 hour strictly is for tutorial; that means, you are not addressing new material, but you are readdressing, student is getting engaged with the material that was already taught. You can have 4:0:0, 4:0:2 or 5:1:0 and 0:0: 2, 0:0:1 and so on. You can have several combination and all are permissible.

For example, skill enhancement courses are dominantly 2 credits which can mean either I have it as 0:0:2 or 1:0:1; all possibilities exist. And now one thing that has happened - while the credit system has been around for quite some time, it is only a label that is given to a course rather than strictly implemented. What does one credit mean? 1 hour of classroom interaction per week over a semester.

One may have 15-16 teaching weeks in a semester. It depends on how you want to compute. In some institutions we know off, there are only 14 teaching weeks. The rest of them are all used for concerned examinations, tests or some other activities. But actual

classroom interaction is restricted to anywhere from 14 to 16 weeks. Even if you take the highest one; one credit is defined as 1 hour of classroom session interaction per week over a semester.

So, one credit would mean 16 classroom hours over a semester maximum and 1 hour of tutorial per week over a semester or 2 hours of laboratory or field work per week over a semester. So, what does 3:0:0 mean? The 3 into 16 maximum or minimum 3 into 14 ok that is 42; 42 to 48 classroom sessions per week and no more. And 3:1:0 would mean that I will have 42 to 48 classroom sessions and 14 to 16 sessions of tutorial.

Why is it important? Because the scope of the course or the amount of content that is dealt in a course should be commensurate with the number of classroom hour of interactions that we have.

For example, I cannot have a 2:0:0 course and give them 70 classroom sessions. They are totally incompatible and against the UGC norm; though in some places, it seems to be happening. One should move towards this credit definition; there is no particular choice about the credit definition, it is universal throughout the world and it has been adopted by UGC quite some time back. So, one should be very clear that the number of classroom hours of interaction will also decide the amount of content that you are dealing with.

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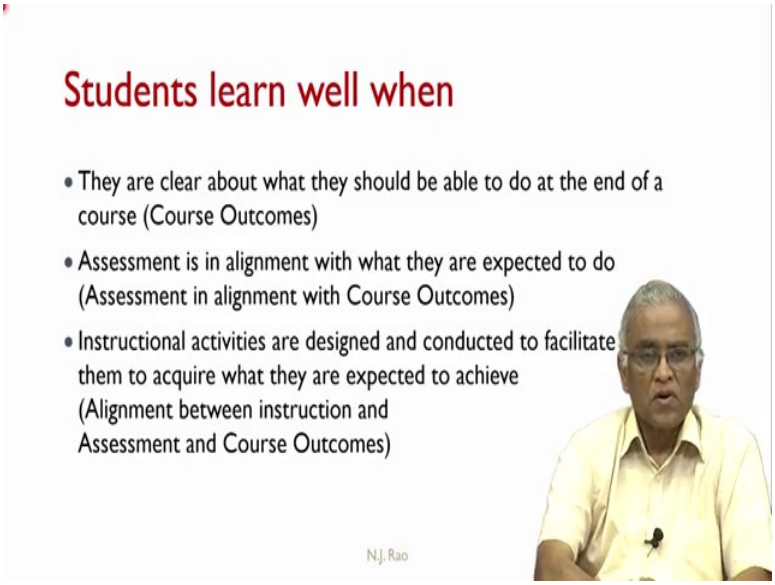

And again, we want to repeat this: Students learn well when they are clear about what they should be able to do at the end of a course. There is course outcomes; assessment is in alignment with course outcomes. Instruction activities are designed and conducted to facilitate them to acquire, what they are expected to achieve. Alignment between instruction, assessment and course outcomes.

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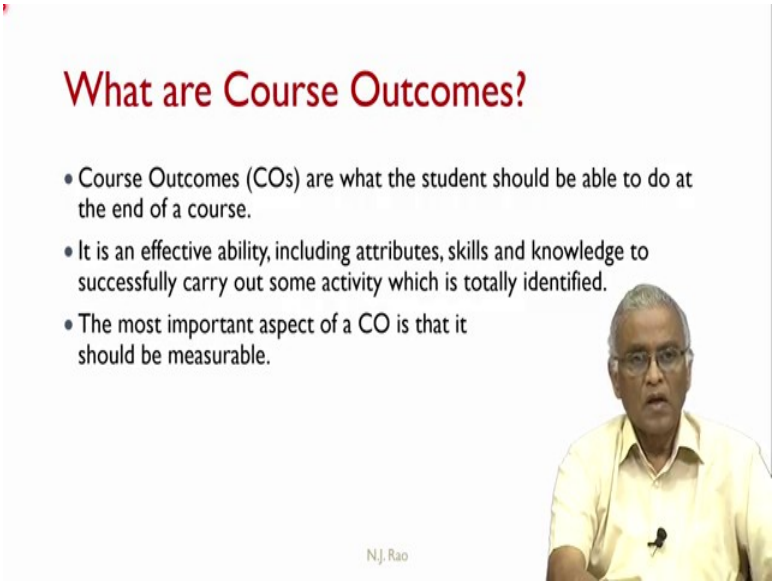

What are course outcomes? Course outcomes are what the student should be able to do at the end of a course. Stating in another words, it is an affective ability including attributes, skills and knowledge. If one is willing to do all the 3 domains a course outcome can address- that is cognitive, affective and psychomotor domain- to successfully carry out some activity which is totally identified; that is what a course outcome is.

The most important aspect of a course outcome is it should be measurable. When you talk about any outcome, it should be observable and measurable. If it does not satisfy these two properties it is not an outcome, it is certainly not a course outcome.

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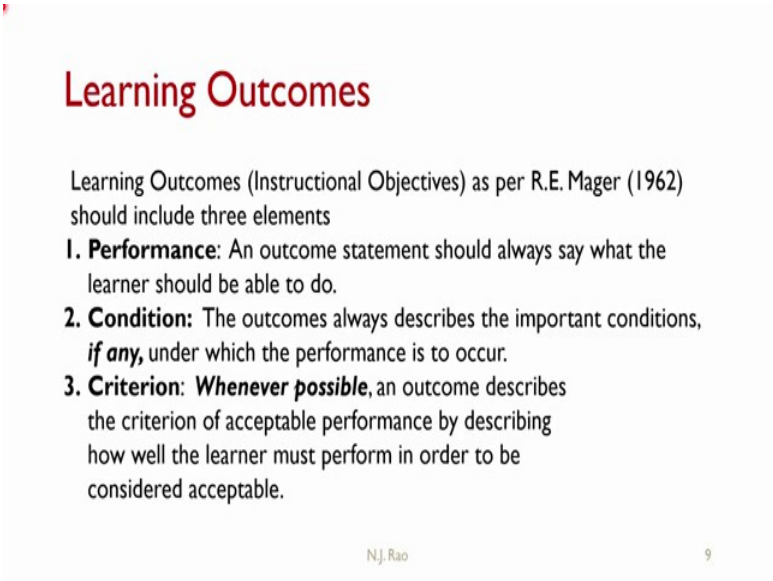

How do we write the outcomes? For example, learning outcomes or instructional objectives, (there are other several other words that are used we have listed them) they have been an issue or of concern for all educationists or people who work in the area of education or educational psychology.

One of the early ones is due to Mager who is still active who still talks about how to attain this learning outcomes and in 1962, he proposed that a learning outcome should have 3 elements. One is called performance; the outcome statement should always say what the learner should be able to do. For us it becomes a bit nebulous. Then, condition - the outcomes always described the important conditions if any; that if any is important under which the performance is to occur.

For example, in school level a student should be able to add 7 digit numbers on paper and pencil; which means the condition is paper and pencil. I need not even set that condition, instead of paper and pencil I do not write anything. So, the student is welcome to use a calculator, paper and pencil or even a laptop or any other means.

So, condition 'if any' means it is optional. Then coming to criterion; whenever possible an outcome describes the criterion of acceptable performance by describing how well the learner must perform in order to be considered acceptable. The performance for it to be acceptable, you define some criteria. For example, you should be able to measure using Vernier Callipers, the length of a given line or object within let say 0.1 millimetre. So,

unless I am able to measure within that, performance is not acceptable. So, that becomes a criterion for acceptance of the performance. So, conditions are optional and criterion are also optional. So, strictly speaking I can have just one statement called performance for a course outcome.

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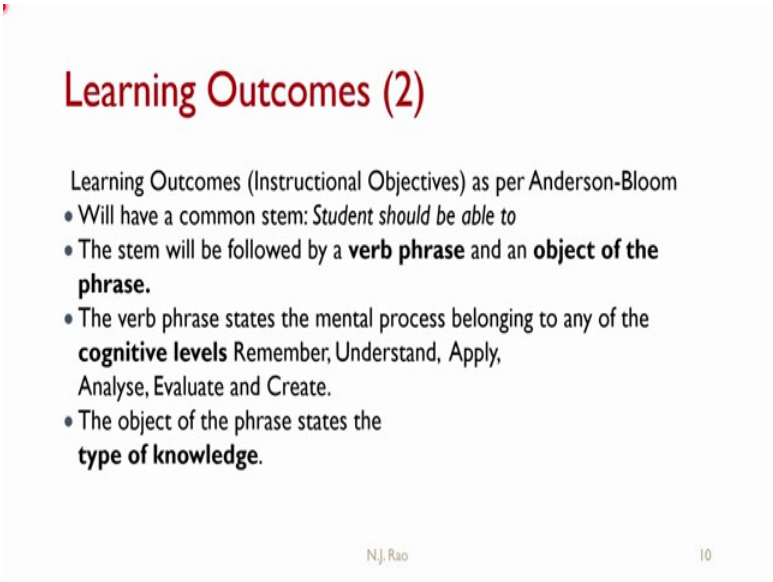

The same learning outcomes or instructional objectives as per Anderson-Bloom, it will have a common stem; 'student should be able to' for example is a common stem. That means, whenever I read the course outcome statement whether I write it or not, I will read it as student should be able to, this particular stem should be followed by a verb phrase, it need not be single verb, it can be verb phrase and an object of the phrase, what are you acting on object of for that activity.

The verb phrase states the mental process belonging to any of the 6 cognitive levels and the object of the phrase states the type/kind of knowledge, it is acting on. So, Anderson-Bloom have used the words, verb phrase, and object of the phrase.

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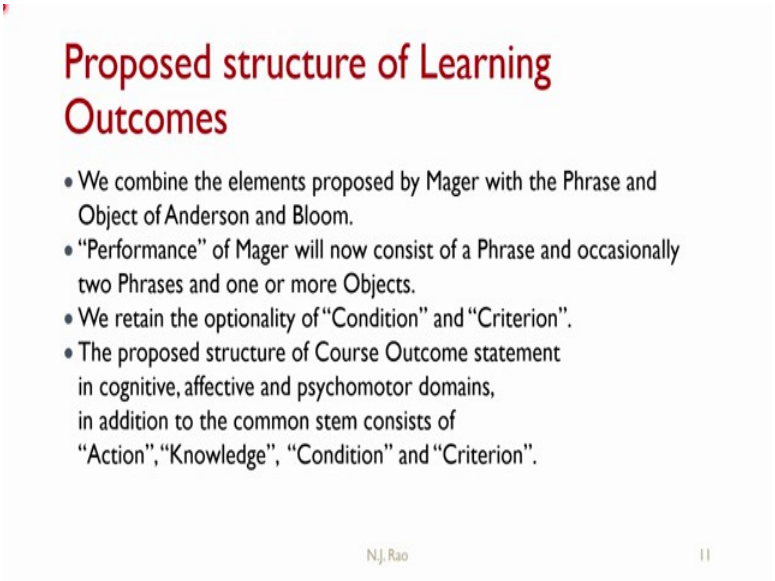

We are proposing a structure of the learning outcome by combining the elements proposed by Mager with the phrase and object of the Anderson- Bloom. So, we will replace the word performance of Mager, it will now consist of a phrase and occasionally two phrases and one or more objects (if you want to talk in the language of Anderson and Bloom). We retain the optionality of "Condition" and "Criterion". So, the proposed structure of course outcome statement in cognitive, affective and psychomotor domains, in addition to the common stem consists of action, knowledge, condition and criterion.

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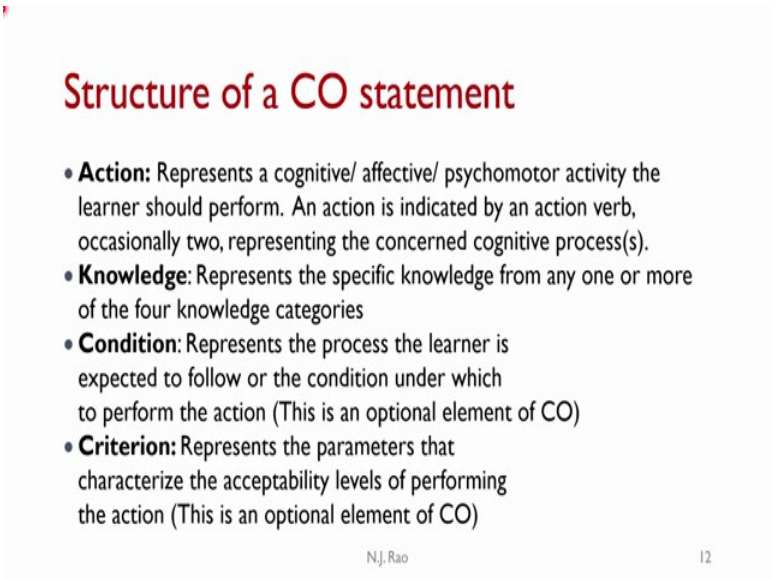

So, this is the structure of a CO statement we are proposing: We call it "action" represents a cognitive, affective psychomotor activity the learner should perform. An action is indicated by an action verb, occasionally two, representing the concerned cognitive process. We have given a whole bunch of action verbs for all the domains. When you write an outcome statement, assuming that the common stem is already written down, a CO statement should always start with an action verb.

"Knowledge", represents a specific knowledge from any one or more of the four knowledge categories. It need not be only from one. It can be one or more or the four knowledge categories.

"Condition" represents the process the learner is expected to follow or the condition under which to perform the "action". For example, if you want the student to titrate something, you have to specify which particular equipment in the laboratory should be used to perform that particular action - that becomes a condition.

"Criterion" represents the parameters that characterize the acceptability levels of performing the action; this is also an optional element. So, there are 4 elements of a CO statement action, knowledge, condition and criterion. Condition and criterion are optional.

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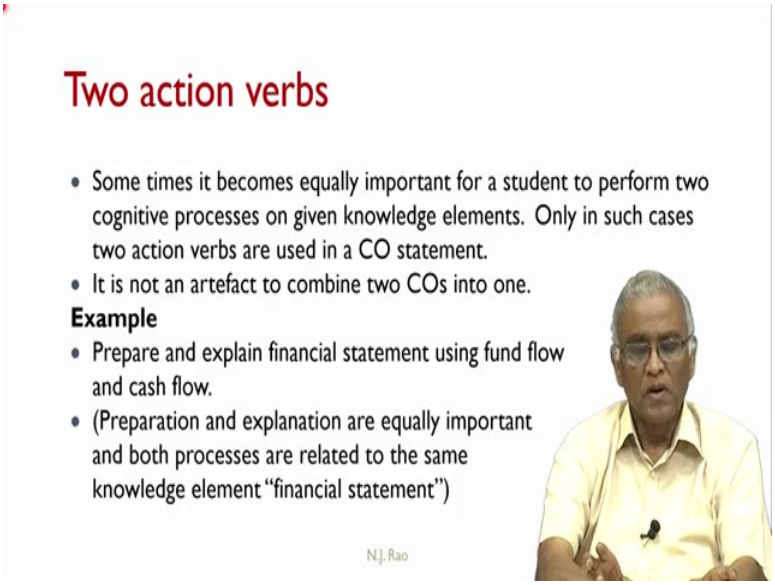

Occasionally, you may want to use two action verbs. Under what conditions do we want to use? There are two cognitive processes that a student should perform on the same set of knowledge elements; Only in such cases two action verb should be used. It should not be used as simply "because I have written too many I bring two and write just and between the two statements". No, you cannot use two action verbs for combining two COs into one.

For example, Prepare and explain financial statement using fund flow and cash flow. The knowledge part of it is financial statement using fund flow and a cash flow. Financial statement is the knowledge element; using fund flow and cash flow are the conditions. Preparing the statement is important and explaining the financial statement is the also equally important. That means, both the cognitive activities have the same knowledge element and same condition and only in such cases, use of two action verbs are permitted.

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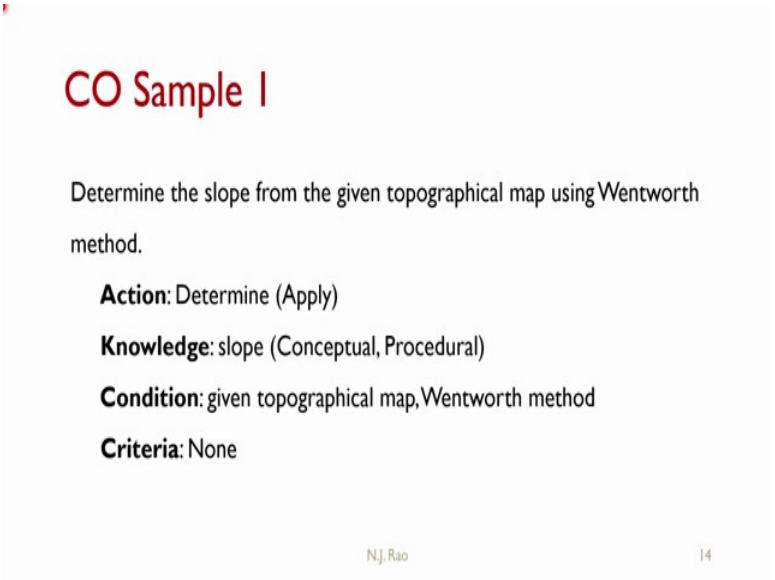

Some samples: Determine the slope from the given topographical map using Wentworth method. Action is "determine"; it belongs to "apply" cognitive process. Knowledge part is "slope"; it is both the concept and well as there is a procedure associated with that. What is the condition? You have to do it from a given topographical map and using Wentworth method. You have to determine the slope, we have not put any criteria for that. So, these are the elements of this sample.

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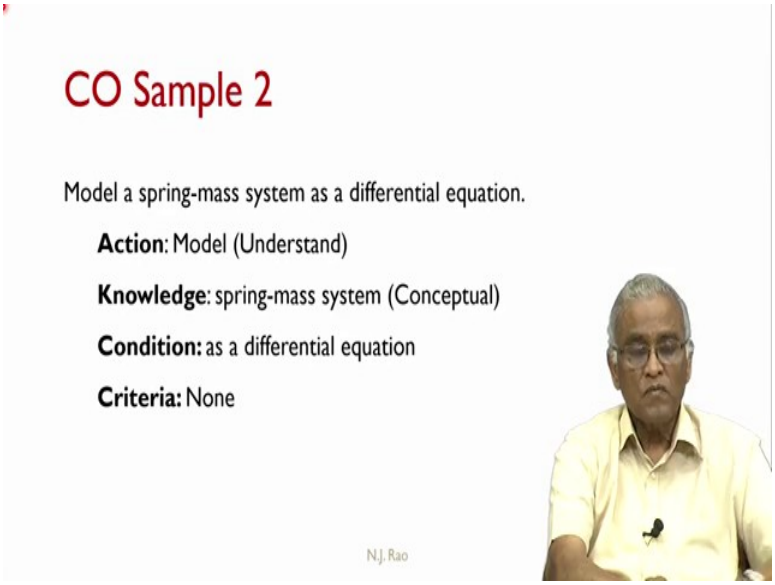

Sample 2: Model a spring-mass system as a differential equation. Modelling belongs to the category of understanding. Knowledge element is spring-mass system which is conceptual, condition as a differential equation. You want to model it only as a differential equation and that is a condition, and there is no criterion.

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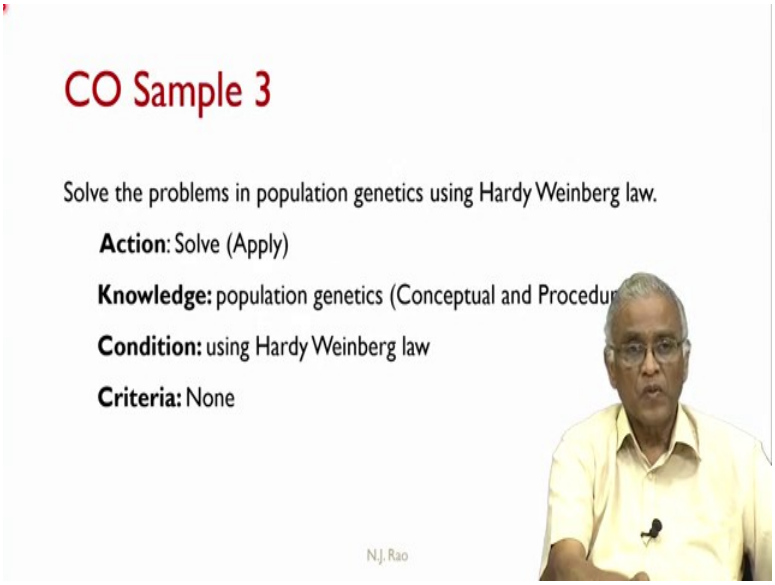

Sample 3: Solve the problems in population genetics using Hardy Weinberg law. The action is solving which belongs to apply; knowledge is population genetics which comes

under conceptual and procedural knowledge. And condition is using Hardy Weinberg law, there is no a criteria.

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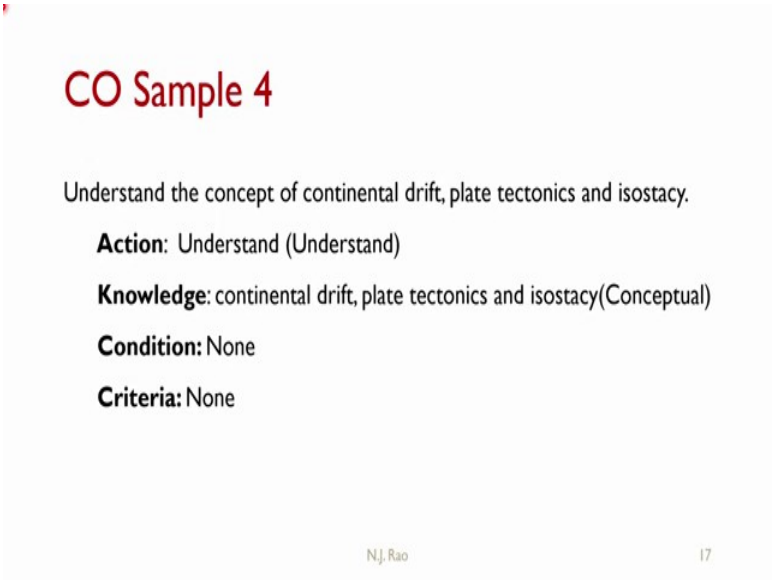

Sample 4: Understand the concept of continental drift, plate tectonics and isostacy. The action is to understand. The knowledge elements are continental drift, plate tectonics and isostacy and all are conceptual. There is no condition or criterion.

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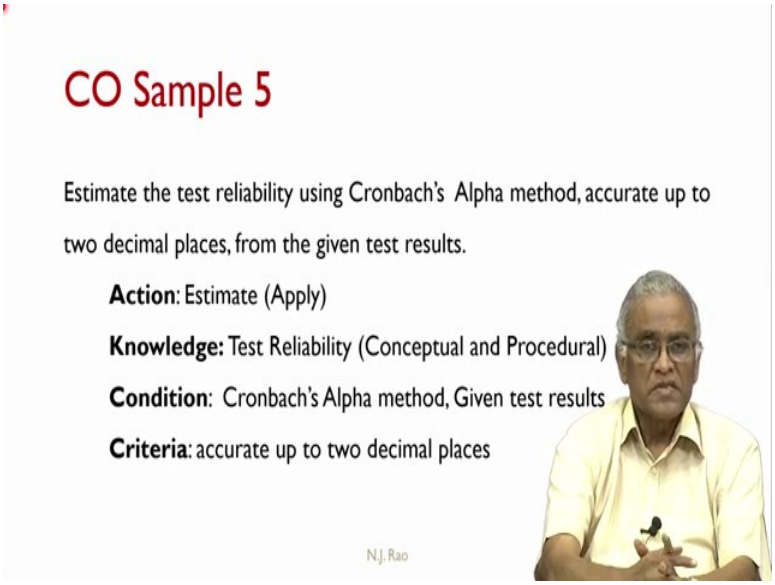

Sample 5: estimate this test reliability using Cronbach Alpha method, accurate up to two decimal places from the given test results. So, action is estimate that belongs to apply.

Knowledge is test reliability, which belongs conceptual as well as procedural knowledge. And condition is Cronbach Alpha method and given test results. Have to work only on the test results and using Cronbach Alpha method and criterion is accurate up to two decimal places. So, as you can see all the elements are present in the case of this sample.

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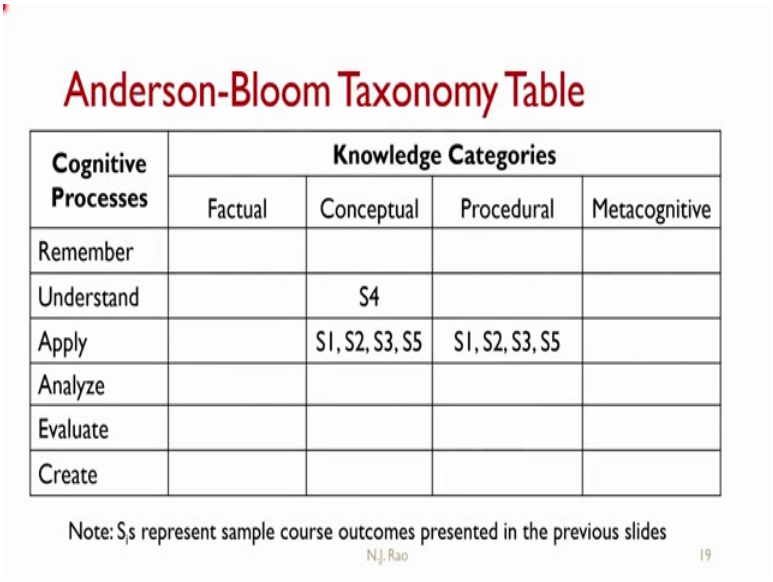

We locate these sample statements in the taxonomy table. For example, S1, S2, S3, S5 all belong to apply, but they have both conceptual and procedural knowledge, that is why we locate them in both the cells. That is in the cell (3, 2) and (3, 3). Whereas, S4 there is only one category of knowledge namely conceptual and there is one cognitive process understand. So, it is in one cell. S 4 is in (2,2). So, all these S represents a sample course outcomes that we have presented in the earlier slides.

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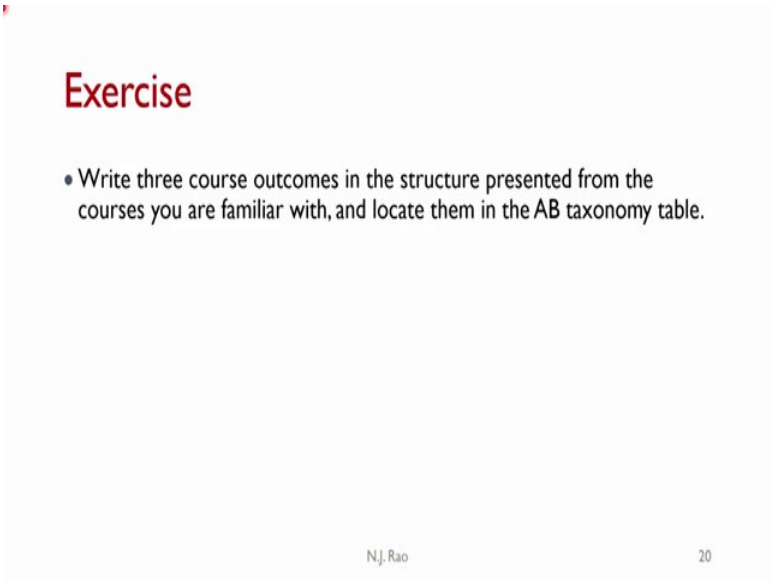

Based on the knowledge presented till now or procedures that we have given till now, write three course outcomes in the structure presented from the courses you are familiar with and locate them in the AB taxonomy table.

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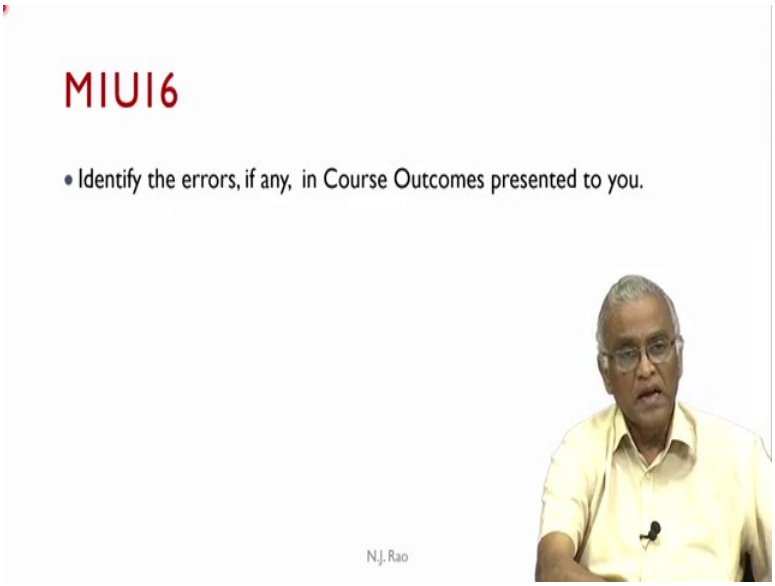

This is at the first level exercise; we will be looking at it in the next unit. There are many other conditions to be followed, when you write a good course outcome and we will show some sample course outcomes and ask you to find out errors in writing those course outcome statements. Thank you very much.