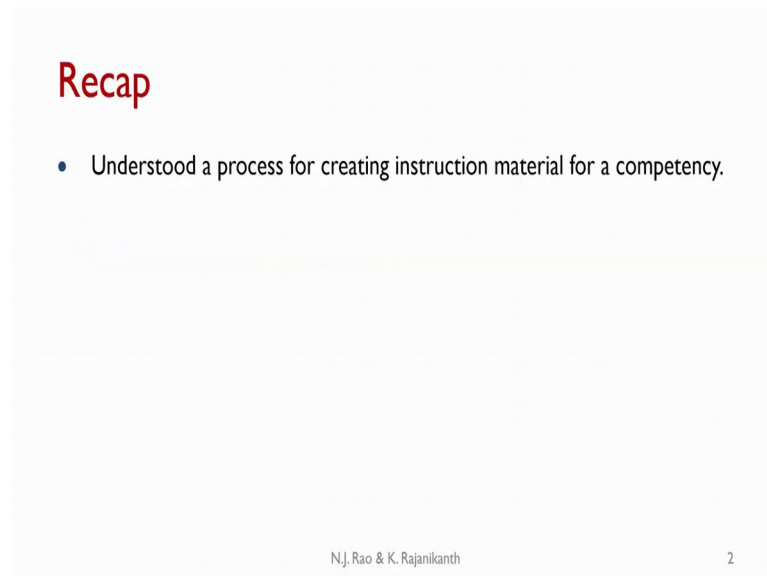


TALE - 2 Course Design and Instruction of Engineering Courses
Prof. N. J. Rao
Department of Electronic Systems Engineering
Indian Institute of Science, Bengaluru

Lecture - 12
Implement Phase 1

Greetings and welcome to TALE Module 2 Unit 12 on the Implement Phase.

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Recap

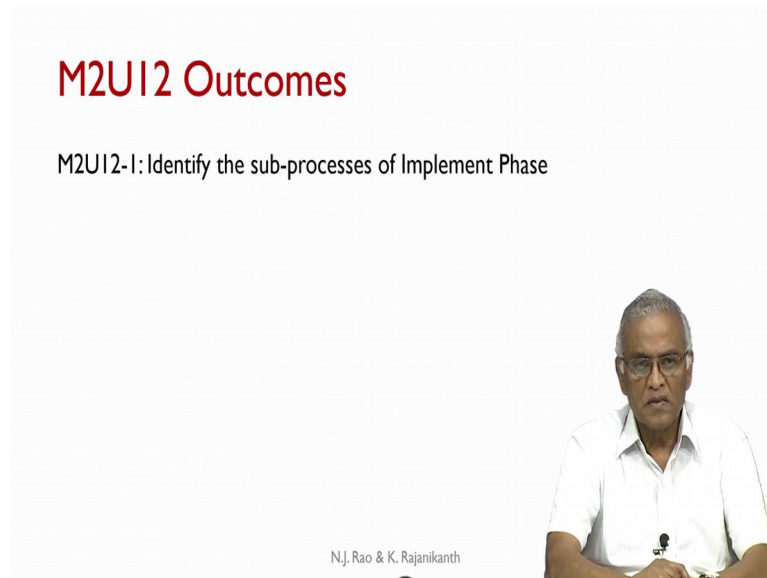
- Understood a process for creating instruction material for a competency.

N.J. Rao & K. Rajanikanth 2

In the previous unit we understood a process for creating instruction material for a competency. was related to development phase of course design. Course design is to be done within a certain instructional system design framework. There are several frameworks, but we are following ADDIE. ADDIE is Analysis, Design, Development, Implement and Evaluate, the 5 phases of ADDIE model.

Till now we have seen the analysis phase in which we created the course outcomes and elaborated them into competencies. In design phase we addressed the issue of assessment and how to plan assessment in alignment with that of competencies and course outcomes. In the development phase we looked at how to create instructional material for a competency and we proposed ‘script and dialogue’ phase of material. If this is followed then one can develop the instructional material while the learning material is only one of selection. Occasionally the teacher prepares some material which is not readily available in a textbook.

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M2U12 Outcomes

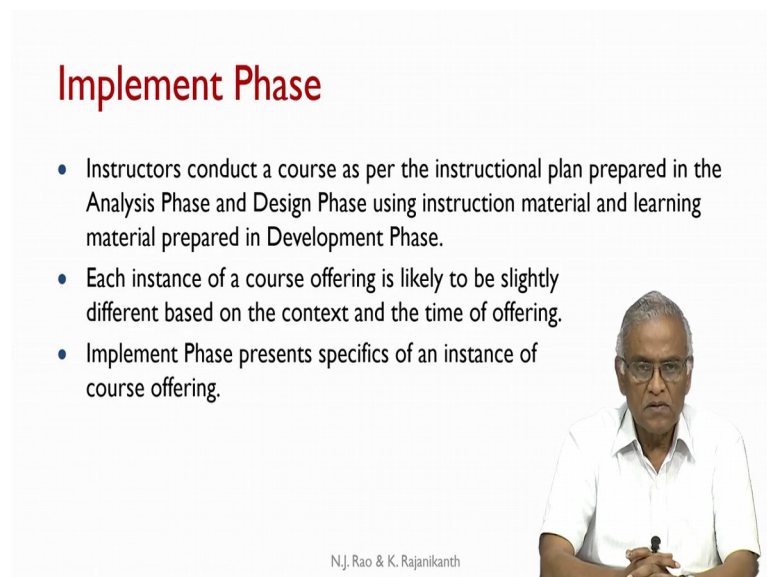
M2U12-1: Identify the sub-processes of Implement Phase

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Implement phase: the intended outcome is identification of sub-processes of implement phase. Every phase will have some sub-processes and though the sub-processes and their sequence is not anything unique, but some set of sub-processes we should identify and sequence them. One set of sub-processes is presented here which we found advantageous and useful.

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Implement Phase

- Instructors conduct a course as per the instructional plan prepared in the Analysis Phase and Design Phase using instruction material and learning material prepared in Development Phase.
- Each instance of a course offering is likely to be slightly different based on the context and the time of offering.
- Implement Phase presents specifics of an instance of course offering.

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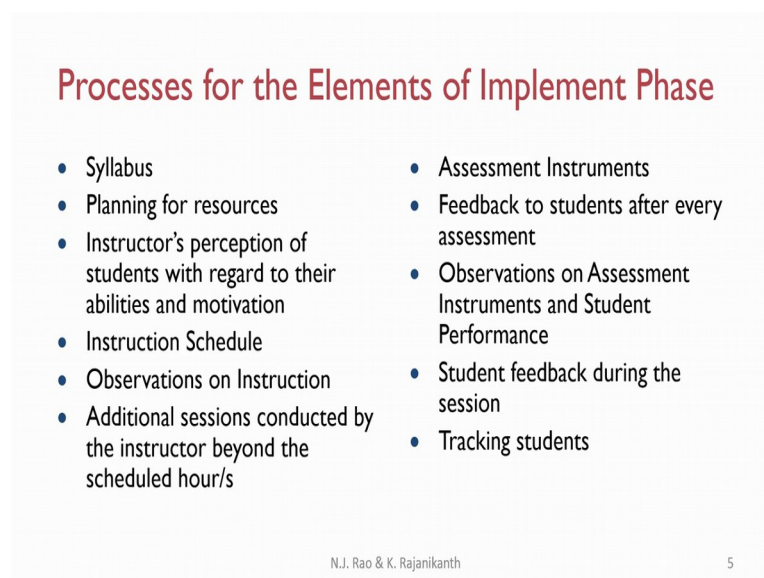
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Implement phase follows the development phase, but whenever you are implementing each one is an instance of a course offering. When I offered a course in 1 semester it is one instance of offering a course.

But every time I offer this course the context becomes slightly different. First of all the students who come to my course are now different compared to the previous one, and there could be minor changes with regard to organization in the institute where I am offering or some new material might have come and I myself may want to make slight alterations to the content of the course so on. Therefore, each instance of course, offering is likely to be slightly different based on the contexts and the time of offering.

When you are planning Implement phase it should present the specifics of an instance of course offering. That means, if I am planning to offer a course in the coming semester from August 1st, I should write for myself all the specifics of the offering of that course the way I want to do from the August term. There is some specificity. Content of the implement phase will differ from one offering to the other slightly not significantly unless the curriculum is overhauled, and completely different material is brought in. In that case you should start all over again from analysis phase and go through all the other phases as well.

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Processes for the Elements of Implement Phase

- Syllabus
- Planning for resources
- Instructor's perception of students with regard to their abilities and motivation
- Instruction Schedule
- Observations on Instruction
- Additional sessions conducted by the instructor beyond the scheduled hour/s
- Assessment Instruments
- Feedback to students after every assessment
- Observations on Assessment Instruments and Student Performance
- Student feedback during the session
- Tracking students

N.J. Rao & K. Rajanikanth 5

There are different elements and processes of Implement Phase. Writing a syllabus (will elaborate that presently,) planning for resources for conducting a course, and planning

for that. When students change from one year to the other, then I need to have a feel for the kind of students do I have. I cannot typecast/stereotype them. Each batch is slightly different, and we go through trying to find out instructor's perception of abilities of students and their motivation.

Every teacher will have to prepare a lecture schedule/lecture plan. Observations and instruction: after I conduct a class session, I record my observations (how it happened, what difficulties were there or what successes were there) in 2 or 3 sentences. Sometimes we conduct additional sessions for various reasons for the same also should be recorded.

Create assessment instrument specifically for that semester, whether it is quizzes or class tests or end semester exam (if it is an autonomous institution or otherwise if it is a affiliated college the controller of exam will arrange for design of assessment instrument for SEE). Feedback to students after every assessment, observations on assessment instruments and student performance, student feedback during the session. Tracking the students: - we want to keep track of performance of the students so that a little advanced action can be taken rather than waiting until the end of the semester.

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Syllabus

- A well written **syllabus** guides faculty and students alike.
- It provides students with information about the broad aim of the course, the specific course outcomes the student is expected to demonstrate at the end of the course, the instructional plan, work expected of the students, how performance will be evaluated and several other issues.
- By distributing a written syllabus at the beginning of the course, the instructor can minimize student misunderstandings about expectations for the class.
- Syllabus can also keep faculty on track throughout the semester and help to ensure that the course does not stall at any one point (Joyce and Marilyn 2004).

First element of implement phase is syllabus. The ways the word “syllabus” is understood in India and elsewhere are somewhat different. The word “syllabus” is normally understood as a list of topics organized in some fashion, sometimes as units or sometimes based on the topic you divide them into some paragraphs and list the topics.

You indicate the number of credits associated with the course and list the textbooks and references.

Any syllabus book from any of the universities will only have this material. Teachers will take it for granted the syllabus is already known to the students. In some cases, the teachers would give (one sheet of printed paper or make it available on a website) something about the description of the course to the students. In all good institutions especially autonomous institutions, there is a practice the teacher will write something about the aims of the course and what is he expecting, but if you survey any of these documents nobody follows any particular format.

Whereas internationally each university will prescribe a format for submitting the syllabus (slightly different format from the other.) All faculty members will have to submit the syllabus in the format given by the university or college from all programs. We will now try to define syllabus in this sense. There is even a book written on this by Joyce and Marilyn about writing the syllabus.

A well written syllabus guides faculty and students alike. Especially it makes very clear to the students what they need to, what they are expected to do and so on, and also serves serve as a guide to the faculty. There is a tendency with some faculty to spend more time on their favorite topics and less time on other things, sometimes even drop some of the topics. The syllabus should guide the faculty. Faculty member himself will write the syllabus. Only thing after writing the syllabus and presenting it to the students, during the semester he is expected to follow that.

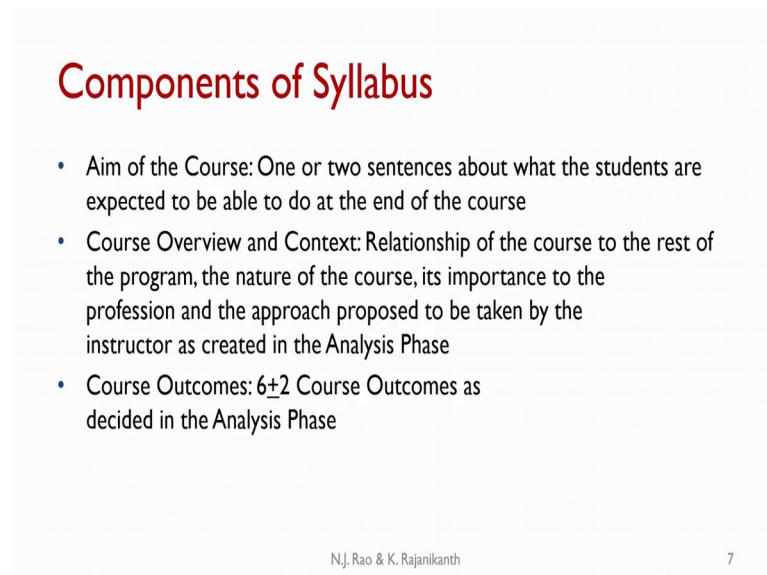
Syllabus itself provides students with information about the broad aim of the course, specific course outcomes (COs), the student is expected to demonstrate at the end of the course, instructional plan, work expected of the students, how performance will be evaluated and several other issues. First time when you write to the syllabus in this format it may look very imposing and unnecessarily detailed, but once you do that from year to year you are only likely to slightly tweak the elements of that. So, it is not a big burden on the teacher to keep upgrading or modifying the syllabus from one semester to the other.

By distributing a written syllabus at the beginning of the course, the instructor can minimize student misunderstandings about expectation for the class. It may be clear to

the teacher, but it may not be so clear to the student. If it is not communicated, if the student misunderstands and does not cross check, he pays a very heavy price towards the end of the semester.

To eliminate this misunderstanding a well written syllabus will play a very important role. Syllabus can also keep faculty on track throughout the semester and help ensure the course does not stall at any one point. You should move on, and you have some goals to reach. The main goal is really to facilitate the students to attain the stated course outcomes.

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Components of Syllabus

- Aim of the Course: One or two sentences about what the students are expected to be able to do at the end of the course
- Course Overview and Context: Relationship of the course to the rest of the program, the nature of the course, its importance to the profession and the approach proposed to be taken by the instructor as created in the Analysis Phase
- Course Outcomes: 6±2 Course Outcomes as decided in the Analysis Phase

N.J. Rao & K. Rajanikanth 7

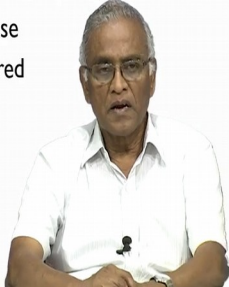
Components of the syllabus are several. It is always good to write one or two sentences saying what the course is all about what is aim of this. Course overview and context - contains relationship of the course with the rest of the program, the nature of the course, its importance to the profession and the approach proposed to be taken by the instructor.

This was created in the analysis phase. Course context and overview the way it is written in analysis phase should just be brought here. Write the course outcomes (these were also prepared in the analysis phase and bring them here.)

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Components of Syllabus (2)

- Course Competencies: 15±5 Competencies which are elaborations of Course Outcomes and which represent the Instructional Units
- Content of the Course: As a list of topics
- Learning Resources: Textbooks, References and annotated Internet Links
- Assessment Pattern: As decided in the Design Phase
- Attendance Policy: The minimum attendance required as per the College/ University norms and/or the stipulations of the instructor
- Instruction schedule: Classroom and laboratory schedules giving specific dates



N.J. Rao & K. Rajanikanth

Further the course competencies (elaborations of course outcomes) if you are writing 6±2 course outcomes, the number of competencies may maybe around 15 plus or minus 5, but never really more than 20, and very rarely it will reach 20. With each competency we associate one instructional unit (that is what we have explained in the previous unit.) Content of the course is the list of topics which everybody is familiar with.

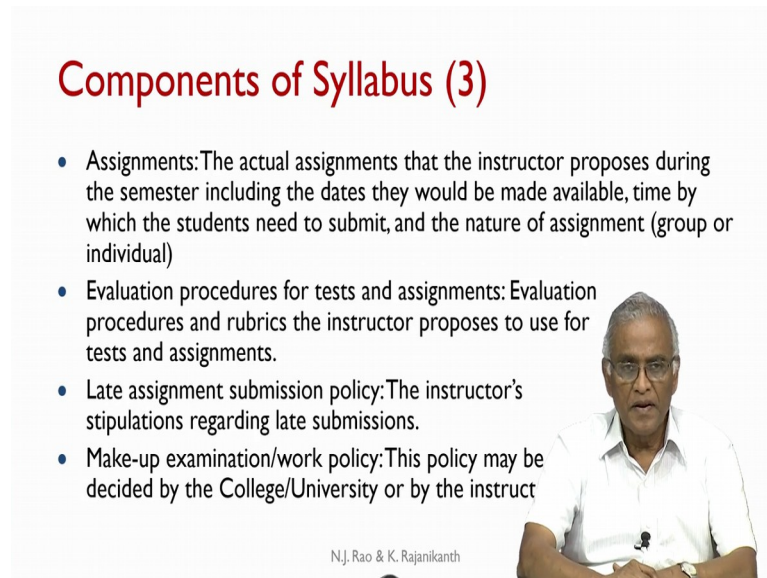
Learning resources - textbooks, references and annotated the internet links constitute the learning resources. If some academic management systems are being used, some curretted material both from books and internet can also be prepared by teacher and made available.

Assessment pattern as decided in the design phase should be mentioned. Assessment pattern would also talk about how much percentage for CIE, what are the components of that, how much weightage is given to that, how much percentage for the SEE, and what restrictions you have from the institution or the university. Whatever has been done in the design phase needs to be put here.

Attendance policy - the minimum attendance required as per the college/university norms and the stipulations of the instructor. In an autonomous college an instructor can also additionally stipulate, but in an affiliated college it is the university that decides the norms (like minimum 75 or 80 percent attendance and so on.) If one falls short of that what are the necessary steps to be followed are also part of attendance policy.

Instruction schedule - classroom and laboratory schedules giving specific dates. Every time the course is offered the dates will change so lecture plan with the dates (instructions schedule) need to be included.

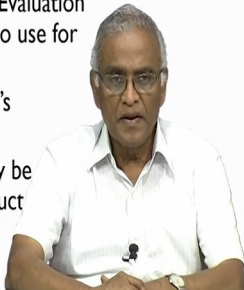
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Components of Syllabus (3)

- **Assignments:** The actual assignments that the instructor proposes during the semester including the dates they would be made available, time by which the students need to submit, and the nature of assignment (group or individual)
- **Evaluation procedures for tests and assignments:** Evaluation procedures and rubrics the instructor proposes to use for tests and assignments.
- **Late assignment submission policy:** The instructor's stipulations regarding late submissions.
- **Make-up examination/work policy:** This policy may be decided by the College/University or by the instructor

N.J. Rao & K. Rajanikanth



Assignments – if 2 assignments are planned then the teacher is expected to prepare these assignments in advance, at what time they would be made available to the students, by what time the students need to submit, and the nature of assignment, whether it is group or individual assignments and so on. Whether it is 2 or 3 assignments, and all the details need to be put together including the dates.


Evaluation procedures for tests and assignments, and if any rubrics are being used, all the structure of the assessment or the tests and assignment should be very clearly mentioned. For example, an assignment may have only 2 problems to be solved, but assignments can have more questions partly from understand and partly from apply category. So, whatever marks you are allocating the rubrics you are following, if you want the student to write a report all that should be part of evaluation procedure.

Late assignment submission policy: If there is a learning management system that is involved for submission of assignment, it will reject anything that the student submits after the stipulated time. The late assignment submission policy should be written in advance and communicated. Sometimes you have a make-up examination or work policy.

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Components of Syllabus (4)

- Citation style for papers: If assignments are in the form of reports, the citation style to be followed for all the references used.
- Behavior expectations: Instructor's expectations of students' behavior with regard to timing of coming into the class, usage of cell phones, mobile internet devices and laptops etc.
- Academic dishonesty/cheating/plagiarism: These are generally laid out by the College/ University.



N.J. Rao & K. Rajanikanth

If assignments include reports, the citation style for giving references to be followed for should be informed. Samples can be given to show how the citation should be given.


Behavior expectations, instructors expectations of students behavior, with regard to the timing of coming into the class, usage of cell phones, mobile/internet devices, and laptops. Rules related to academic dishonesty, cheating or plagiarism are generally laid out by college or university itself. That information also should be appended here.

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Components of Syllabus (5)

- Instructor and Teaching Assistant contact information: Information about where, when and how the instructor or teaching assistants can be contacted by the students outside the classroom for all issues connected with the course.
- Accommodation of differently abled (Divyang) students: Specific support systems available to the Divyang students.

Note: Delete the items that are not relevant to your course



N.J. Rao & K. Rajanikanth

The students want to find out when they can meet the teacher if they have any doubts. If the instructor may say such and such hour in a week he is available and anyone can come in and meet him with regard to that course only. Information on how the teaching assistants, if any, should be contacted is also to be made available.

These days colleges/institutions are encouraged to enroll differently abled students, called Divyangs. Specific support system that is available if there are Divyang students should also be clearly mentioned. Both NAAC and NBA clearly seek information from colleges/institutions about the arrangements for Divyangs.

As it is seen there are about 17- 18 items in Components of Syllabus, and if you consider any of these items are not relevant in your context or for your course they may be deleted. These days as everybody is accessible on internet devices, you can put this up and share with the students in WhatsApp right on the first day of the class. Or before the course starts this can be shared with the students who were registered for your course. What is the expected from the students is made very clear, so that there are no misunderstandings and any consequences thereof

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Planning for Resources

- Depending on the number of students and delivery technology chosen the resources needed to conduct the course are to be planned.
- If group discussions constitute a significant classroom activity, the furniture should permit such an activity.
- If students are expected to work with their laptops/ tablets in the classroom, the furniture, power supply connections and Wi-Fi modems should be available.
- If an LCD projector is proposed to be used, it is necessary to specify how the input to the projector is proposed to be handled.

Because the technology is varying, you need to plan for resources. Of course, you may want something, but it may or may not be available in the institute. So, you should take a little advance action before the semester starts with regard to the resources. For example,

depending on the number of students and delivery technology chosen, the resources needed to conduct the course are to be planned. That is the purpose of planning.

If group discussions constitute a significant classroom activity the furniture should permit such an activity. You cannot have rigid benches and chairs and expect group discussions. This is likely to increase though it may not be very significant now. If the students are expected to work with the laptops or tablets in the classroom, the furniture, power supply connections and Wi-Fi modem should be made available.

If an LCD projector is proposed to be used, it is necessary to specify how the input to the projector is proposed to be handled, does the teacher has to bring his laptop? For example, I may have an invited lecture from someone, he may bring only a pen drive. Can someone put the pen drive in and the present a lecture?

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Planning for Resources(2)

- If one wishes to access the Internet or a Learning Management System (LMS) during the classroom session, the necessary Wi-Fi connectivity has to be made available.
- Some instructors may wish to use flip charts, show large maps, show artifacts, demonstrate a device or conduct an experiment.
- Many of these arrangements require longer term planning.

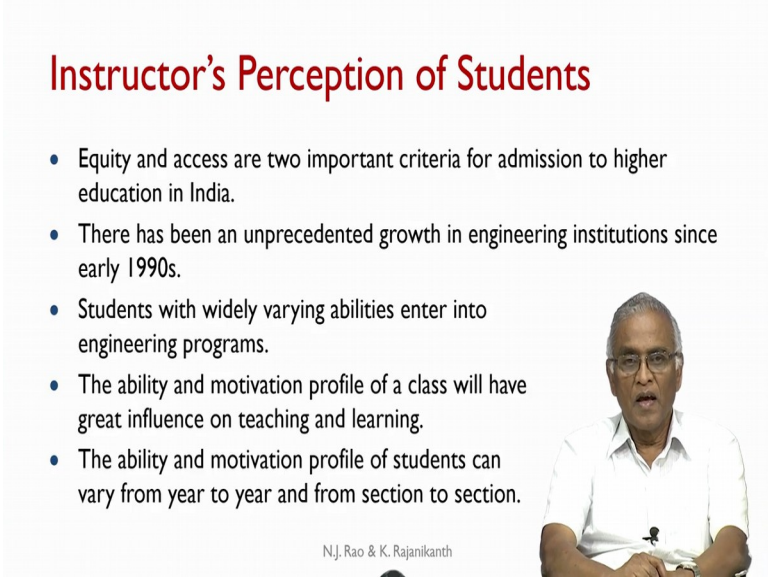
If you are conducting the course using a learning management system, the necessary connectivity to the LMS has to be made. If you are using MOODLE and if you expect student to answer a small quiz (while quiz can be created using LMS,) unless you have Wi-Fi connectivity in the class students' responses cannot be collected.

Some instructors may wish to use things like flipcharts, show large maps, show artifacts, demonstrate a device or conduct an experiment. Many of these arrangements require longer-term planning, and one cannot just walk into the first class of the expect all these

things to happen. For example, Professor Andy Pausch of Carnegie Mellon University used to prove a point (to whatever purpose you consider) he used to do a strange thing in his class to talk about product design. He would bring a working CD player and bring a large sledgehammer and break it first.

Of course, we are not going to recommend to any of you that you should start bringing something and break it in the class, but he had his way of doing things. So, anything a teacher wants to do it has to be planned in advance.


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Instructor's Perception of Students

- Equity and access are two important criteria for admission to higher education in India.
- There has been an unprecedented growth in engineering institutions since early 1990s.
- Students with widely varying abilities enter into engineering programs.
- The ability and motivation profile of a class will have great influence on teaching and learning.
- The ability and motivation profile of students can vary from year to year and from section to section.

N.J. Rao & K. Rajanikanth



The instructor should also have a view of the students. What kind of students are coming to me? You cannot make it stereotype and say any way all students are bad with the exception of a few students. It is not a good idea to stay with that kind of stereotype image. In India somehow engineering education was considered “anybody can do”, and that is a way to get into some meaningful employment.

There had been a lot of social pressure in early 90s and the parents wanted their wards to do engineering, and there was an unprecedented growth of engineering institutions. It is also privatized, you have to fill in the seats and once you have to fill in the seats there is once again both political and other social pressure to keep reducing the entry level capability of the students, anyone who just passes let us say with 40 percent marks is eligible to join engineering.

If you look it even CET (Karnataka –Common Entrance Test) you can have 50,000 rank, but you need to have a rak. Aa 50000 rank person also can come and join an engineering program. When you have such a situation, that is, you want equity. Equity would mean people belonging to all social strata, all economic strata, should have chance to study engineering and irrespective of their cognitive abilities. In addition students should have access, it should not be very difficult to get into that in terms of either fees or distance from home town. These two have resulted in a tremendous growth of engineering institution. In the class room, (you have to acknowledge that) you have students with widely varying abilities. As teachers in those institutions cannot even complain about it as we do not have any reason to exist.

The college is giving you employment, you are a teacher, and these are the students that are with you. So, you just need to do the best job with the students and the curriculum that you have. You will have to adjust your instruction to suit your class and the kind composition of your class. The ability and motivation profile of a class will have great influence on teaching and learning. This profile of students can vary from year to year or from section to section, if there are multiple sections for a course.


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Instructor's Perception of Students (2)

- An approximate profile of students can greatly help the teacher.
- There are many ways of profiling.

Sample:

	Number of students				
	Level 1	Level 2	Level 3	Level 4	Level 5
Abilities					
Motivation					



N.J. Rao & K. Rajanikanth

So, what we suggest is an approximate profile of the students, this can be created after consulting a psychologist. Based on the data about the student where he came from, what kind of performance he had earlier, you can create a profile like cognitive abilities and

motivation. For example, many of you teachers would have experienced this motivation issue, because students with absolutely zero motivation engineering are pushed by the parents to do engineering. Those students sometimes rebel and do not want to perform, sometimes they struggle hard to bring themselves into the main stream.

I divide into some 5 levels and the number of students, (if I have 60 students) how are they distributed with respect to their abilities and motivation. If I can have that, it is a background that serves for me to plan my instruction, it is not that I can create a formula with respect to this. A teacher will have to say at what level do I actually plan my instruction and actually conduct the course, based on his/her perception of students.

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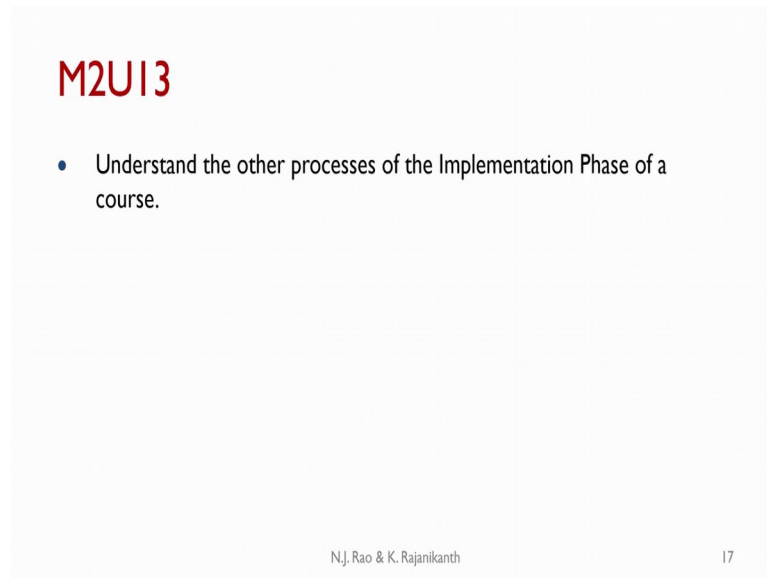
Exercise

- Write the syllabus of your course within the framework you are operating for a course you taught or very familiar with.

Thank you for sharing the results of the exercise at tale.iiscta@gmail.com

We would like you to write the syllabus of your course within the framework you are operating, for a course you taught are familiar with. What you can do is look at the 17-18 items that we talked about. Most of the things were already done in the earlier phases. Arrange those items in this sequence. We will appreciate if you can share with us,.

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M2U13

- Understand the other processes of the Implementation Phase of a course.

N.J. Rao & K. Rajanikanth 17

In the next unit which is implementation phase 2 we will look at the remaining process of implementation phase.

Thank you for your attention.