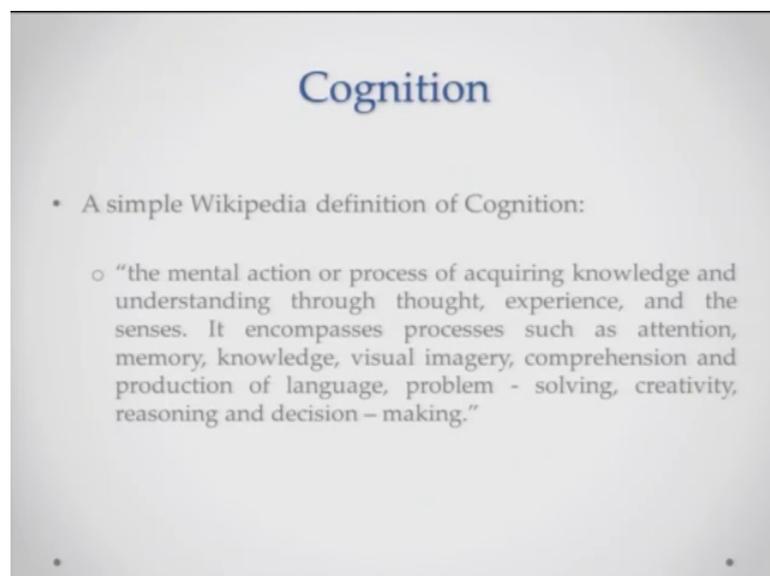


**Advanced Cognitive Processes**  
**Dr. Ark Verma**  
**Department of Humanities & Social Sciences**  
**Indian Institute of Technology, Kanpur**

**Lecture – 01**  
**Preface Outline and Course Structure**

Hello and welcome to the first class on the course introduction to Advanced Cognitive Processes. I am Dr. Ark Verma; I am an assistant professor of psychology and cognitive science at the Indian Institute Of Technology, Kanpur.

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Let us begin talking about something that will be the course matter of this entire course and has been that of earlier courses well. We are going to talk broadly about cognition in this course, what is cognition? If I look to Wikipedia and if I try and get the most simple most basic definition of cognition that basically includes or let me read out the definition to you, the definition says, cognition is a mental action or process of acquiring knowledge and understanding through thought experience and the senses.

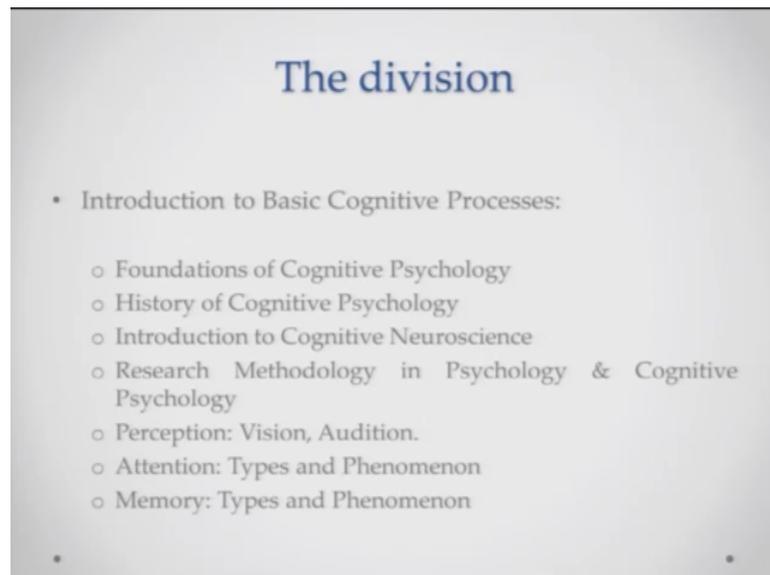
So, there are three things through which you get knowledge first is thought, second is experience and the third is senses. We will talk about all three of these things as we move ahead in the course. Now, what do these things comprise of, the definition says that it encompasses processes such as attention, memory, knowledge, visual imagery,

comprehension and production of language, problem solving, creativity, reasoning and decision making.

There could be other things as well say for example, cognition and emotion and we have not really mentioned perception here as well. But, this basic definition of cognition tells you that cognition probably is almost everything that you do everything that you experience and how do you learn from that experience and how do you behave after you have had that experience, that is pretty much what cognition is about.

In this course introduction to advanced cognitive processes, I will be covering a subset of what cognition actually talks about. Before I move ahead with this course in this first lecture I would like to introduce you to some of the structural elements of the course what are we going to cover the subject matter and other things.

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Some of you might remember I offered the course on introduction to basic cognitive processes earlier in NPTEL and that might be available for you to view in YouTube or other channels as well, but that course was a basic course on cognitive psychology wherein I covered a small subset of what cognitive psychology is all about.

I began with talking about foundational issues in cognitive psychology, then we did a little bit of a historical background of where cognitive psychology is actually coming from, if some of your psychology students you would remember the psychology starts

somewhere around you know the time when William Wundt established the first psychology lab and there was so many movements within psychology after that. If actually in this historical background and cognitive psychology, try to cover up the philosophical antecedents of psychology as well.

So, we talk about foundations of cognitive psychology, what is cognitive psychology actually about, is it different from general psychology or let us say a health psychology or clinical psychology, how is it different and those kind of things we have covered in the last course. Also, I talked about in a small introduction of cognitive neuroscience which is an important aspect of doing cognitive psychology. See cognitive psychology attempts to explain and understand cognitive processes, it also in some sense tries to give an introduction about how the brain is an integral part of these cognitive processes. There in, where cognitive neuroscience comes in.

Cognitive neuroscience is basically a field which seeks to connect the behaviour to the brain and how does the brain contribute to various human behaviours and say for example, even if you are talking about simple things such as perception how is the brain contributing you to perception what is it that the brain is actually doing here the areas of the brain which are involved. So, that is what I did in introduction to cognitive neuroscience.

Then, we talked about research methodology in psychology in general and also we talked about research methodology in cognitive psychology. Some of the experiments and the methods that I will be talking about in this course, we have given a small introduction to them, say for example, reaction time experiments or fMRI, neuroimaging experiments, EGERP experiments at a brief introduction to these methodologies has been given in an earlier course. However, it does not mean that when I am talking about these methods in this course I will not be explaining I will not be discussing them in some detail. Certainly, to people who have not taken the earlier course it should not be that you will miss out on a lot if you are doing this course alone.

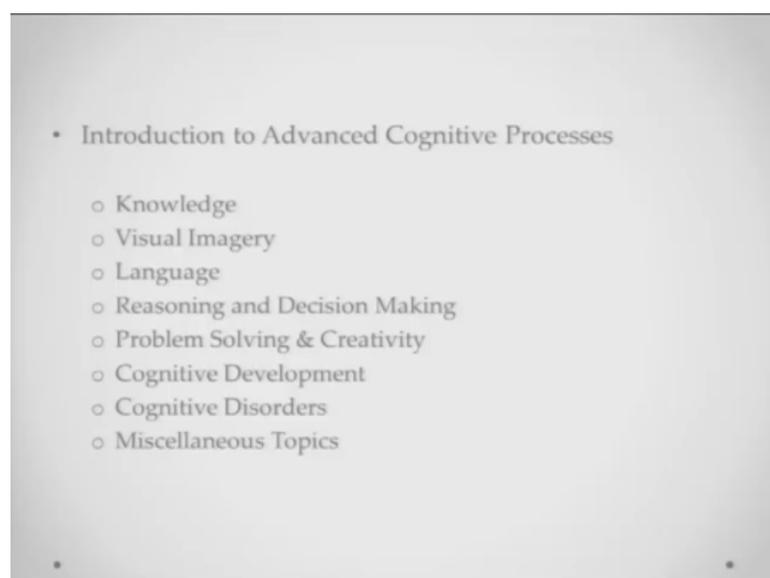
So, even though the discussion is somewhere based in you know it starts from the last course there is no requirement as such to do that course before you take this course. You can; obviously, take this course as well and if you have time or interest you could go back to the earlier courses as well. So, that kind of gives you a proper background into

those things we will be talking about in this course. We talked about perception in detail, we talked about vision, we talked about audition, we talked a little bit about other perceptual processes as well and I remember talking about the basic theory of different schools in visual perception and what were the different theory editions saying and things like say for example, how does perception and action interact and how the perception action coupling leads to particular kinds of behaviour.

So, I have talked about perception in great detail in that course and if you are interested you are you know in invited you to go there. We talked about attention various types of attention, we talked about divided attention, we talked about concentrated attention, we talked about international phenomena like visual search, change blindness, attention blink those kind of things. We have also talked already about memory and it is various types say for example, short term memory, long term memory, we talked about working memory in a lot of detail and we discussed about the studies about the research findings about that. We also talked about various processes that are involved in memory, various sources of errors in memory and so on and so forth.

So, this is all what I have covered till now in a previous course called introduction to basic cognitive processes. Now, given that all of these topics have been covered in sufficient detail, I did not really want to cover everything else in this small course.

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So, for that reason for the topics that will left uncovered in the earlier course, I am offering this course here which is referred to as introduction to advanced cognitive processes slide in the introduction presentation if you would have seen I have differentiated between what is an advanced cognitive processes or what is a basic cognitive process. However, there is not a lot to that distinction that one needs to make the only thing one needs to understand is that this distinction that I am making here is probably borrowed from Jerry Fodor where he talks about horizontal and vertical faculties. Now, horizontal faculties are supposed to be more basic cognitive functions or more basic mental abilities that people use and invoke in pretty much everything that they are doing.

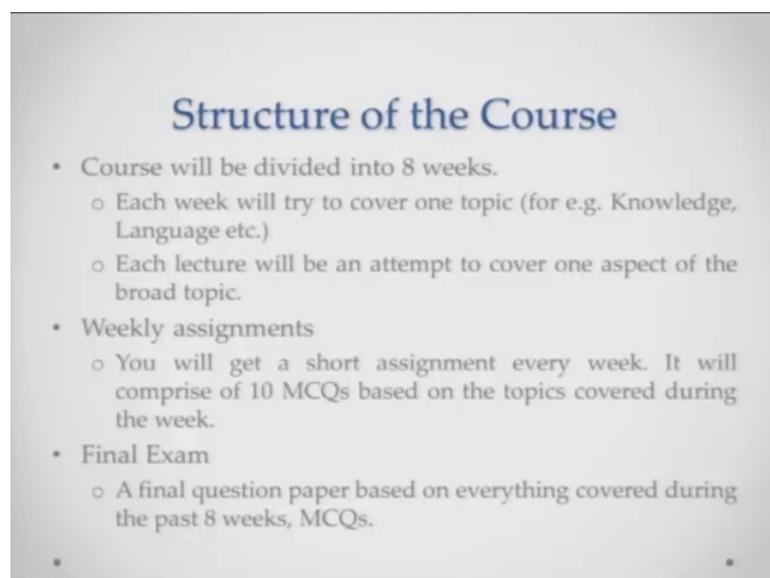
The concept of advanced cognitive processes borrows from vertical faculties things like knowledge decision making problem solving which draw upon those basic processes, but are independent behaviours in their own right. So, that is one of the reasons again it is a slightly superficial distinction that one makes between higher or advance or you know basic cognitive processes, but also for better organization of material I kind of split these into two different courses.

What will I be talking about in this course? I will be talking about knowledge; I will be talking about the various theories of knowledge, say for example, knowledge is structured in our conceptual world how is knowledge structured in the brain, we will be talking about theories of knowledge say for example, semantic networks how do people make categories etcetera all of that I will be talking about in this course. I will be talking about visual imagery, what are the different theories of visual imagery, how have people attempted to understand visual imagery, how closely or distinctly it is linked with things like perception, action thought processes those things we will talk about in this course.

We were also given extended time to language, we will talk about evolution of language; we talk about comprehension, production of language reading and those different things. Also, I will be covering topics like reasoning and decision making we will be talk about problem solving and creativity and at some point I will also try and give a developmental perspective of how people acquire these different mental phenomena. How does one let us say begin to acquire language in great detail or how does one begin to acquire let us say different mental abilities like you know a decision making and those kind of things.

I will probably have a section on cognitive disorders as well wherein I will talk about what happens when people have you know disorders of language say for example, aphasia or dyslexia or those kind of things. Then, I have kept our session on I have kept a section on miscellaneous topics wherein I might be talking about certain important topics in cognitive psychology or in cognition which I have not covered yet or which I have not covered till now. Those could be single lectures or single topics or 2–3 lectures on a single topic or something like that. So, I will try and organize that according to this. So, this is pretty much what we are going to be doing in this current course.

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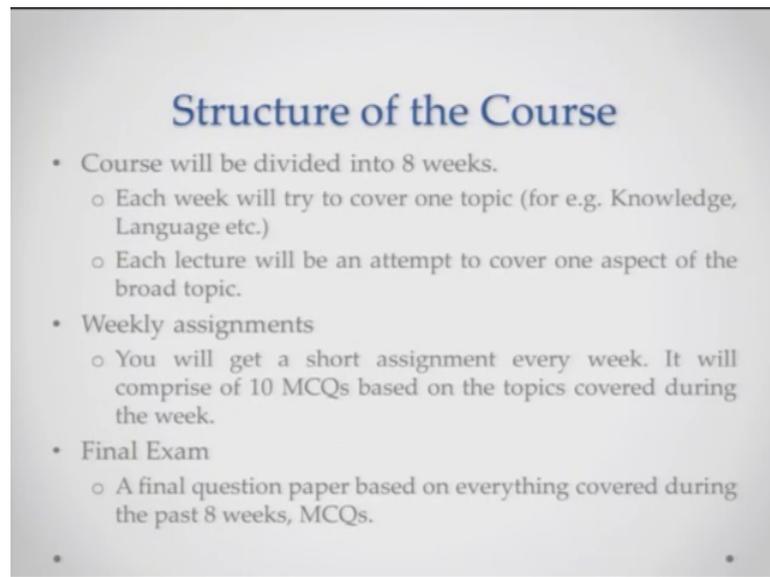


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- Weekly assignments
  - You will get a short assignment every week. It will comprise of 10 MCQs based on the topics covered during the week.
- Final Exam
  - A final question paper based on everything covered during the past 8 weeks, MCQs.

Let me talk a little bit about the structure of the course. So, this course is divided into 8 weeks; there will be 40 lectures, 5 of them every week and at the end of every week you will get a weekly assignment. Now, if you see this distribution here there are 8 topics here and one of my attempts will be towards keeping each week for each of these separate topics.

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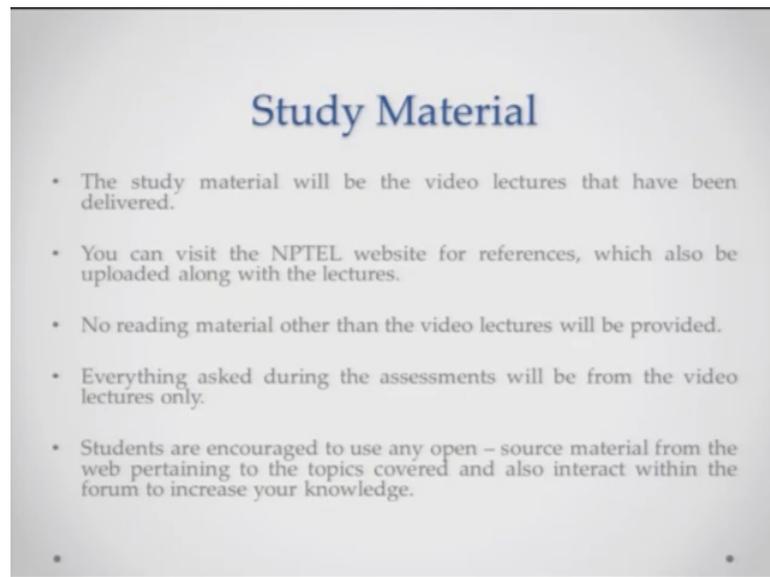
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However, we might discover during the course that whether I am able to follow this strict demarcation or not, but the idea is that each week will broadly try to cover one topic say for example, language or knowledge etcetera and each lecture, if there are 5 lectures under knowledge each of them will try and talk about different things. Say for example, if you are specifically interested in one particular aspect of knowledge, you can actually go down to that lecture and read about it.

Also, there will be weekly assignments. So, every week you will get a weekly assignment at the end of 5 lectures and these weekly assignments will most probably be multiple choice questions and these multiple choice questions will be drawn from the material that I am delivering in these video lectures. There is also an aspect of final exam that is necessary to those who are who want the certification from NPTEL for having done this course and this final exam will basically have almost 50 multiple choice questions, basically drawing again from the material that as covered in these video lectures.

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## Study Material

- The study material will be the video lectures that have been delivered.
- You can visit the NPTEL website for references, which also be uploaded along with the lectures.
- No reading material other than the video lectures will be provided.
- Everything asked during the assessments will be from the video lectures only.
- Students are encouraged to use any open – source material from the web pertaining to the topics covered and also interact within the forum to increase your knowledge.

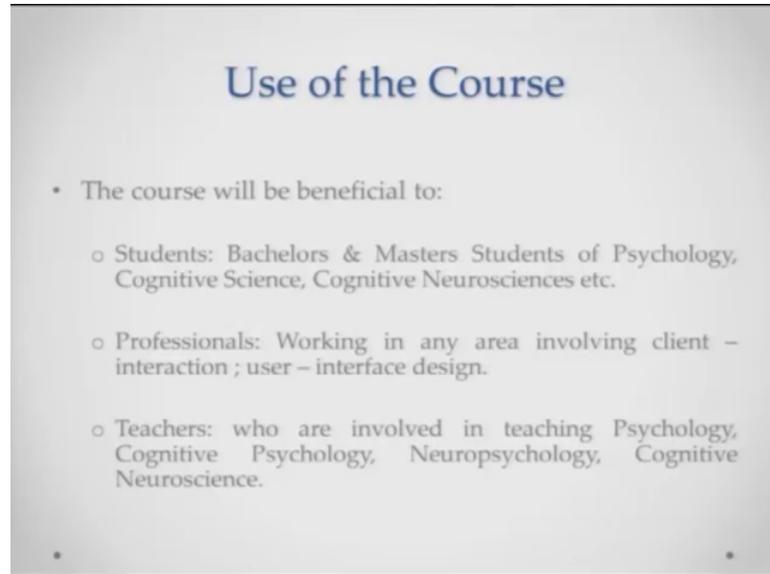
Now, what kind of study material we might be able to provide. So, the study material basically only comprises of the video lectures that are going to be available and they are going to be made available on a week by week basis and you can also visit the NPTEL website for references from where the material from for these video lectures is being arranged for.

So, I have actually pointed out of a few books, couple of reference books some articles might be there which you can actually get hold of in order to have a more detailed knowledge of this. However, for the exam or for any of the assessments the questions are basically made from the video lecture. So, in case you are being able to attend all of these video lectures you do not need any extra material. Obviously, if you need you know to read more about things you know then I have talked you are free to actually look up these books find out where you can get them and read them. We will not be able to provide any kind of reading material other than these video lectures. So, everything asked during the assessment we will basically be only from the video lectures.

Now, students are also encouraged to use any open source material from the web pertaining to the topics that I will be covering. Pretty much any book that you can find on the internet, which is text book in cognitive psychology, will have almost everything that I am going to talk about in anyway. So, if you do not get you know if you are actually need of more you know details study material something like a textbook I would

advise you to look on the net and that you might find a lot of open source text textbooks that are available there.

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Now, who will be the course be beneficial to bachelors and masters students of psychology also of cognitive science cognitive neuroscience and so many other fields, anybody who is interested in human behaviour, who is working on parts of human behaviour say for example, a lot of people in marketing and in sales want to know a little bit about human behaviour they might want to know a little bit about how researching you know cognitive psychology can help them or you can take this course for those you know ideas as well.

For professionals working in any area in which basically involves working with human client and original also client and person interaction you would basically like this course. Also, for people who are working in design, who would want to design products and who want to design user interfaces parts of this course may be useful for you as well. Teachers who are involved in teaching psychology at various levels or cognitive psychology, neuropsychology or cognitive neuroscience might also find the material covered in this course useful. So, that is all from my side I wish you good luck for this course and I hope that you complete the course and appear in the examination for getting the certificate.

Thank you.