

Sociology of Science
Dr. Anindya Jayanta Mishra
Department of Humanities & Social Sciences
Indian Institute of Technology, Roorkee

Lecture – 05

Locating Humanities & social Sciences in Institutes of Technology- Part II Ravinder Kaur

Dear students, in a previous lecture, we discussed the positioning of humanities and social sciences and institutes of technology. Particularly we are looking at why h s s disciplines are there in IITs or NITs or any engineering college in the first place. To understand that we looked at what is the situation in American universities; we found that right from inception top American universities such as Purdue University Stanford MIT, they have always emphasized upon equal importance being given to natural sciences, engineering sciences humanities and social sciences and architecture and planning. For instance I gave you the model at MIT where there is emphasis on four general areas of education we also looked at the fact that why top American universities there was growing demand for courses from humanities and social sciences. One of the reasons can be attributed to the American intervention in Vietnam which is all the known history of twentieth century as a Vietnam War.

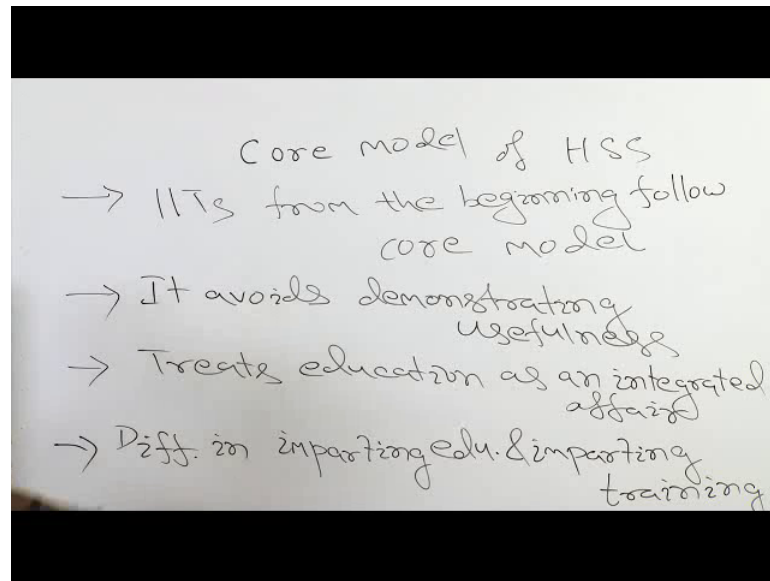
The scientist or the academicians initially felt that whatever that is happening outside the campus, outside the institute it does not concern them, because they are focused on core research, they should not bother about the economic or political or social upheaval that happening outside the campuses academy campuses. But there was a rising discontent against such approach, with which essentially sprang from within the academics. They felt that the academicians must respond to particularly the professors the faculty members from sciences and engineering, they must respond to rest discrimination they must respond to exploitation of the blacks, they must respond to gender inequality, they must respond to problems inherent in building big dams, they must respond to the human environmental economic cost of dam building, they must look at the different issues that can arise due to human cloning or creating genetically modified crops or they must respond to the environmental or climate change and how it is going to affect human beings. Hence courses were designed in American universities, where equal element or

elements or dimensions from social sciences and humanities were also incorporated in engineering curriculum.

In IIT; for instance, IIT came into being up to the Sarkar committee 1946 strongly recommended that there is a need for technology institutes, and such technology institute must help social sciences and humanities in its campuses. There must be a need to integrate humanities and social sciences with the engineering sciences and natural sciences, but Ravinder Kaur says that though the social sciences and humanities have proved its importance in technology institutes right from its inception, but still one can sense that two models are at work, one is a service model one is the core model. In the service model as we discussed a subject is taught because of its perceived usefulness. If it can serve a certain purpose to the engineering students, then that subject would be easily approved in the senate of that IIT. Initially it was felt that English language communication English language learning is crucial to engineering students particularly to the IITians. So, that they can compete in the global market, hence courses on technical communication and language labs came into being. There was a market demand for management from nineties onwards in India hence management departments were created in the IITs to cater to such demand. Because they felt that management the key to handling human resources lies in management discipline and the students who have a deadly combination of an engineering degree from IIT and a management degree from IIM always land and lucrative jobs.

So, it became an ambition of every engineer to get a degree from a top engineering institute like IIT, and get a degree from a top management institute like IIM. It all because of the market demand, if you do not have management discipline then the social sciences and humanities were told to teach these courses having management component; hence came industrial sociology or organizational behaviour or group dynamics or managerial economics or professional ethics from philosophy discipline, but such a service model takes away the very essence of social sciences discipline. The very fact that it gets split into usefulness and non usefulness it stops being the source of critical questioning that is so crucial to the very existence of social sciences and humanities.

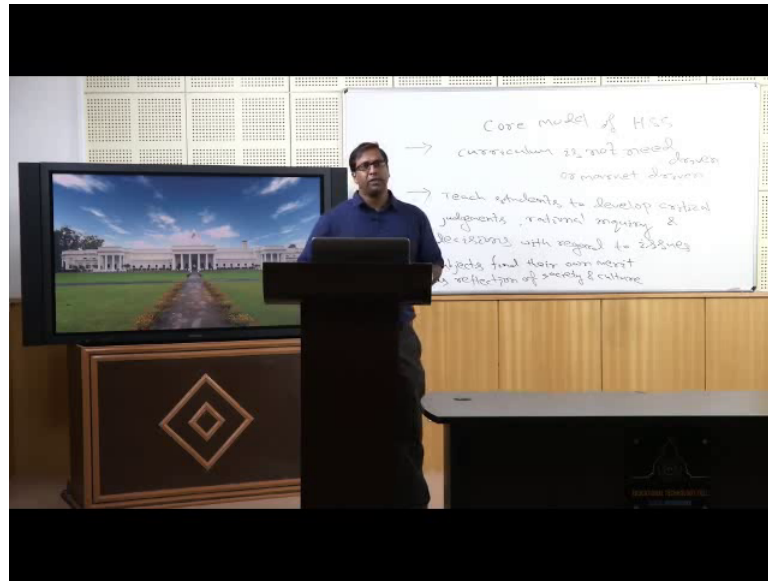
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Now, I shall discuss the core model and its features. Now the core model of humanities and social sciences, it does not try to prove its usefulness to technology institutes or engineering institutes it avoids demonstrating its usefulness. In core model it treats education as an integrated affair. So, one can always make a distinction in a classical science between imparting education and imparting training. That if we are training the engineers then it is so that they get the sufficient skills that will allow them to get into jobs later on. But if we are educating them about societal context about if you are providing them cultural training sensitizing them about issues which are non quantifiable ambiguous or controversial, if allowing them to understand the breadth of human experience and culture the past and present when we are providing education.

So, in a classical science we can make that differentiation a distinction between imparting education and imparting training. So, when we apply the core model we essentially impart education, we are not imparting training, this is how one can argue that the difference lies between core model and the service model.

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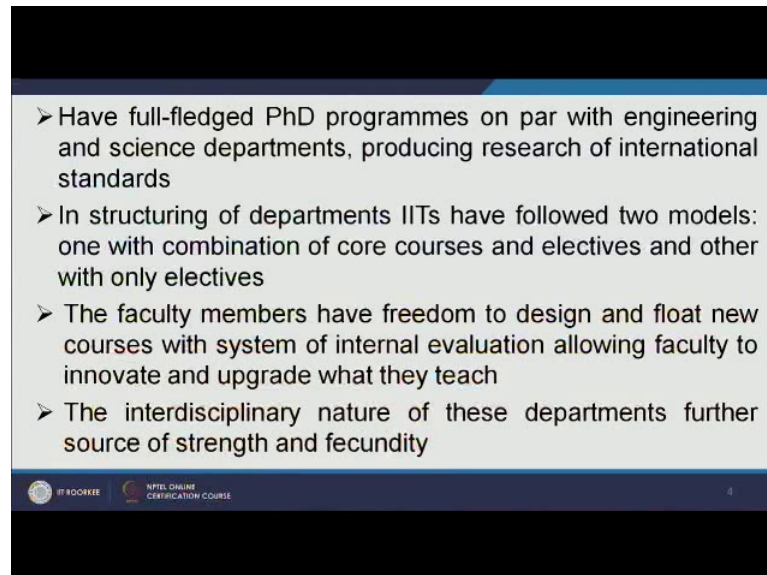


So, the core model is not driven by market its not need driven core model finds a place in the core model the subjects find a place based on their own merit, which is are essentially a reflection of human condition society culture. So, subjects do not have to prove its usefulness or a perceived need.

In core model for instance one can always develop critical inquiry rational judgments; decisions developing decision criteria when dealing with a range of issues. The core model allows students to understand the society as a whole not only society, but also to understand their own individuality their own personality their own personal dispositions hence it is said that h s s disciplines allow the students to hold a mirror to society and to oneself through social sciences and humanities. Through the mirror of social sciences and humanities we look at the society and we look at our self, we look at the different social political cultural aspects of our life legal aspects of our life religious aspects of our life how religion positively or negatively influences people, how economic decisions can affect human lives. It looks at how political agile ideology can be detrimental or can be constructive. It looks at the different laws the framing of different laws having a repercussion on law and order security and on general wellbeing of people. Through social science and humanities we also get to know our self for instance subjects like psychology and sociology make the student understand individuality, identity, personality and through that they get to understand perception memory, leadership ability all these things help the students to know and explore and understand themselves better.

Hence when we say that social sciences and humanities hold a mirror to society and to themselves it is justified.

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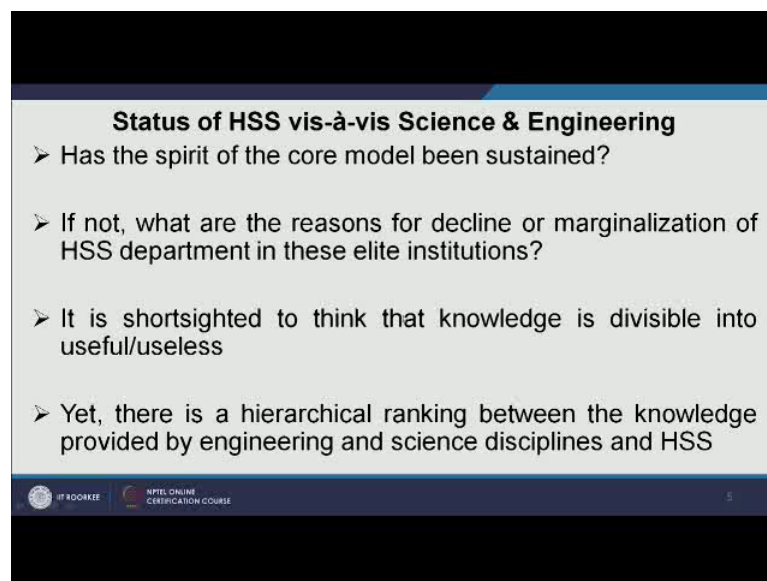


Now, in a core model the humanities and social sciences have full place in PhD programs which are on par with engineering and science natural sciences disciplines. It also produces research of international standards hence they are comparable in those humanities and social sciences there is a strong PhD program with a quality of PhD students the quality of faculty members is top class. The quality of research output is of international standards and because the very fact that the PhD programs it allows the humanities and social sciences to undertake research, rather than just teaching we take undergraduate students, technical communication or industrial sociology or organizational behaviour. So, that helps in exploring and providing incremental knowledge to the knowledge base of humanities and social sciences, through such research programs as PhDs.

So, in the structuring of a department IITs have always followed two models, one for the combination of core courses and electives and other one with only electives. So, faculty members in humanities and social sciences who are best in technical institutes or engineering institutes or IITs or NITs, they have a lot of freedom to choose certain subjects to teach they have a freedom to teach. The way they want the freedom to formulate the course to design the course, according to the needs of the teacher as well as

the students and the system of internal evaluation also gives them that freedom to innovate and upgrade what they have been teaching. So, the IIT model it allows the research scholars as well as the faculty members of humanities and social sciences to innovate and upgrade what they do in terms of their courses in terms of their teaching, in terms of the internal evaluation, in terms of the research that they undertake. So, interdisciplinary nature of these departments also considered as a further source of strength and fecundity.

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Status of HSS vis-à-vis Science & Engineering

- Has the spirit of the core model been sustained?
- If not, what are the reasons for decline or marginalization of HSS department in these elite institutions?
- It is shortsighted to think that knowledge is divisible into useful/useless
- Yet, there is a hierarchical ranking between the knowledge provided by engineering and science disciplines and HSS

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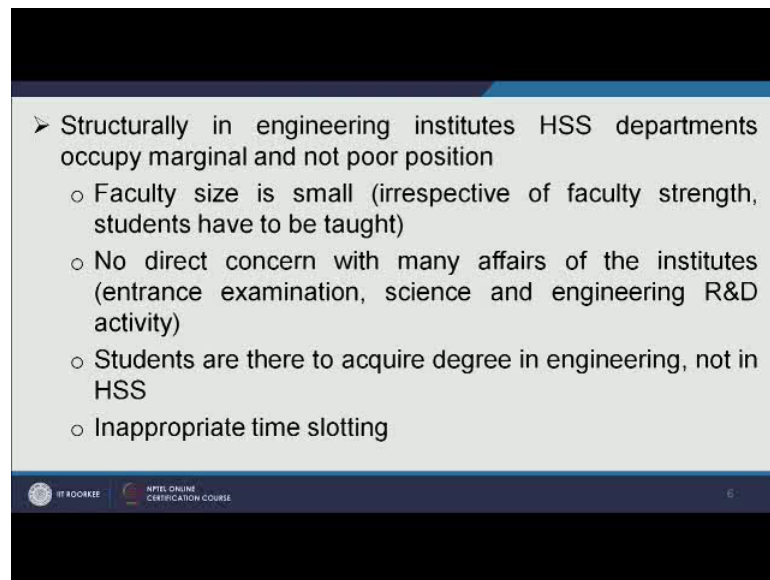
Now, status of if you look at the question of status of humanities and social sciences vis a vis science and engineering, the question that comes to your mind is has the spirit of the core model been sustained. If not what are the reasons for declining or marginalization of HSS department in this area situations. Because the very fact that IITs have adopted the core model of humanities and social sciences is a testament to the fact that it is short sighted of any institute to think that knowledge is divisible into useful or useless. So, such approach is fraught with risk, now if one looks at the history of different disciplines from medieval period onwards, one would find that there has always been certain questioning of certain courses such as arts, craft, painting, sculpture particular in department of armament studies in the earlier times.

But engineering subjects initially one would be surprised to find that was considered as arts engineering subjects were considered as arts, subject because of its proximity to craft

tradition. So, initially in the history of academics the philosophy subjects related to philosophy literature all this enjoyed far superior status compared to the subjects such as engineering subjects, which were thought to be close to the craft tradition, but with the industrial revolution and rapid industrialization in Europe all these things changed rapidly also the it also led to rethinking of academic subjects and their relative position. But Immanuel Wallenstein he is of the opinion that this entire idea of ranking rating different disciplinary knowledge is only 200 years old, and this is nothing, but a social construction is nothing, but created by market demand. The attempt to separate philosophy and science is a very new idea and in fact, Ravinder Kaur cause in that such attempt or she codes Immanuel Wallerstein and say is such attempt to distinguish philosophy and science has two distinct streams of thought with science having an upper hand and the philosophy is fraught with risk, fraught with academic risk it can lead to disastrous consequences in terms of advancement of scientific knowledge. Hence the social sciences and humanities off late though it enjoyed a much superior status earlier off late have witnessed at decline in its status.

Now, there is a kind of a hierarchy that operates within technology institutes which sidelines the humanities and social sciences. The reasons are not far too sick, but the faculty size of humanities and social science department compared to other natural science or engineering sciences department is small, they have the small size. So, but irrespective of the small size the students have to be taught work with their fixed number of courses fixed number of credits that the students have to take in IITs or NIITs and those courses have to be taught by the humanities and social sciences irrespective of their faculty strength. So, there always a there is always a problem there, second the humanities and social sciences do not have any direct concern with many affairs of the institute. For instance they are not concerned with a gate examination or joint entrance examination they are not concerned with the R and D activities of the institute as a whole which mostly.

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- Structurally in engineering institutes HSS departments occupy marginal and not poor position
 - Faculty size is small (irrespective of faculty strength, students have to be taught)
 - No direct concern with many affairs of the institutes (entrance examination, science and engineering R&D activity)
 - Students are there to acquire degree in engineering, not in HSS
 - Inappropriate time slotting

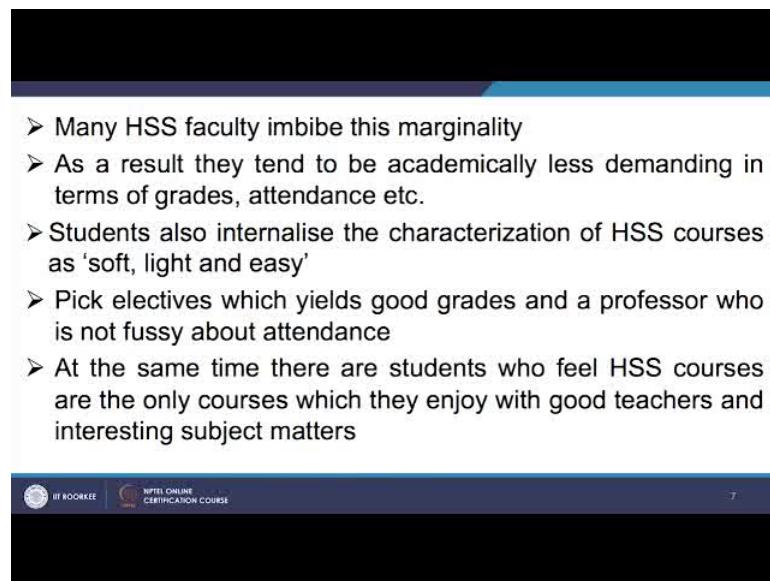
Comes from the natural sciences and engineering sciences and essentially the students are there in IITs and NITs to take a degree obtain a degree in engineering or sciences rather than a degree in social sciences. Hence that automatically sidelines or marginalizes the position of humanities and social sciences and of course, to add to it the inappropriate time slotting the humanities and social sciences courses, either would be 8 'o' clock in the morning or the 5 'o' clock in the evening such inappropriate slotting automatically creates a feeling of marginality amongst of faculty of humanities and social sciences, they feel that they are getting a timeslot, which is not suitable for the students because students in winter the find it difficult to get up in the morning and attend a class at 8 by 5 'o' clock they are sufficiently tired mentally tired to appreciate the courses in humanities and social sciences.

So, such inappropriate slotting also it helps not only in creating that feeling of marginalization amongst of faculty members, but also students engineering students also imbibe that. They understand that this courses are not important courses this courses are soft courses easy courses in this courses. It is easy to score marks, it is easy to obtain a better grade without putting in that much of effort, it is this courses where we can always get away with shortage of attendance; also the certain faculty members in humanities and social sciences who imbibe incorporate that feeling of originality they also are responsible in creating such feeling amongst the faculty students that the courses are soft it is easy to get grades, because the faculty members themselves do not bother about

taking attendance, do not detain students on the best based on shortage of attendance they gave good degree the they give good grades to students even if the effort is less. So, those kind of problems humanities and social sciences do face.

But at the same time there are also courses which have from social sciences which are very popular amongst of engineering students.

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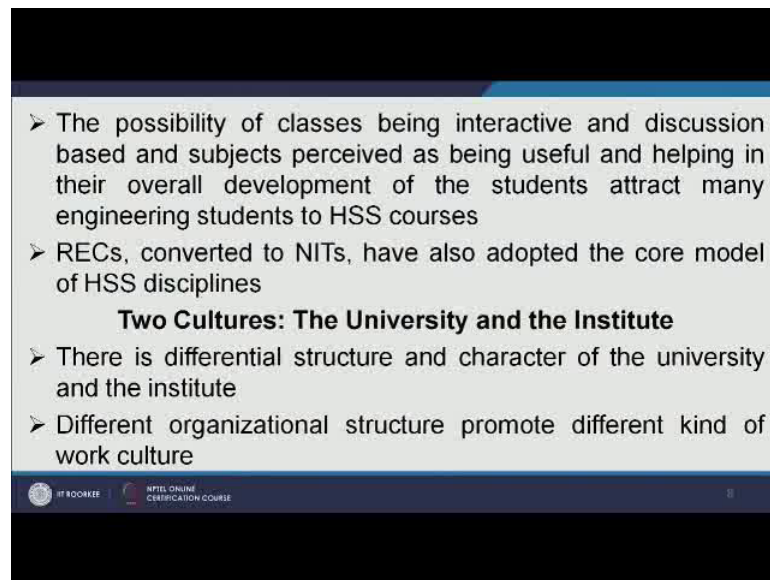


- Many HSS faculty imbibe this marginality
- As a result they tend to be academically less demanding in terms of grades, attendance etc.
- Students also internalise the characterization of HSS courses as 'soft, light and easy'
- Pick electives which yields good grades and a professor who is not fussy about attendance
- At the same time there are students who feel HSS courses are the only courses which they enjoy with good teachers and interesting subject matters

The students enjoy taking this courses because this courses are mostly interactive in nature, this courses are based on discussions and debate and arguments, that the teacher allows the students to argue to debate to understand and appreciate different aspects, different dimensions of social economic or political or religious issues, and such course has become very popular with the students. The students who decide to take up for the studies in social sciences and humanities after their completion of engineering degree. Now such kind of dual approach is nothing new, because anyway the dual approach of students and faculty members also is a reflection of two different ways in which education system has been organized in India.

Here we come to the next part of the article that is the difference between the structural difference between the universities as well as IITs, is there a structural difference is there a difference in their work culture is there any difference in the way they look at the world within is there a internal difference yes. Ravinder Kaur says there is the two models one the university model the other IIT model they represent.

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➤ The possibility of classes being interactive and discussion based and subjects perceived as being useful and helping in their overall development of the students attract many engineering students to HSS courses

➤ RECs, converted to NITs, have also adopted the core model of HSS disciplines

Two Cultures: The University and the Institute

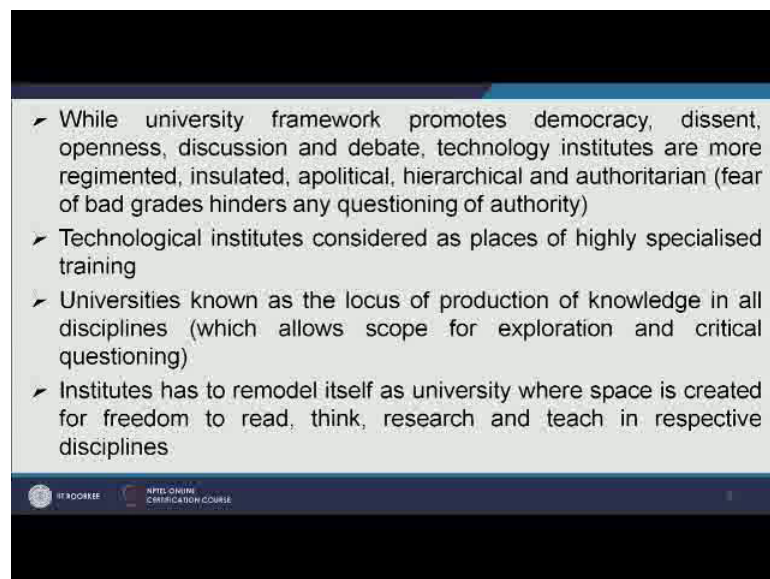
➤ There is differential structure and character of the university and the institute

➤ Different organizational structure promote different kind of work culture

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Two different cultures altogether.

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➤ While university framework promotes democracy, dissent, openness, discussion and debate, technology institutes are more regimented, insulated, apolitical, hierarchical and authoritarian (fear of bad grades hinders any questioning of authority)

➤ Technological institutes considered as places of highly specialised training

➤ Universities known as the locus of production of knowledge in all disciplines (which allows scope for exploration and critical questioning)

➤ Institutes has to remodel itself as university where space is created for freedom to read, think, research and teach in respective disciplines

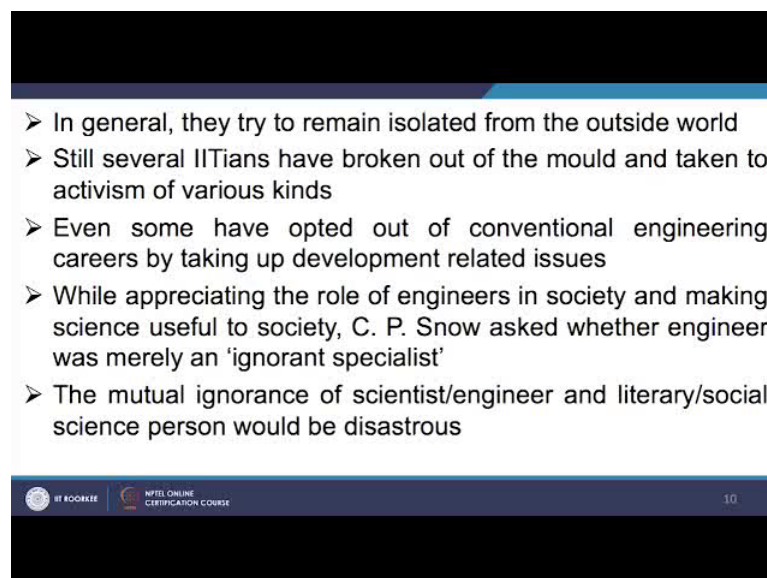
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While the university framework it promotes democracy, dissent, openness, discussion, debate, technology institutes are more regimented rigid apolitical, hierarchical, an authoritarian. The fear of getting bad grades essentially stops the students from raising their voice they do not protest they do not protest about things that are happening outside the campus whereas, in universities sometimes can be the breeding ground for future politicians. So, the students do react do respond to issues happening around them

religious issues political issues dam building, riots political decision making. So, and there is much more openness that is the scope for debate argument in university structure whereas, in the I t structure it is much more regimented insulated apolitical, does not extend regarding any issue, its it tries to maintain ethical neutrality it is hierarchical there is a strong hierarchy that that that exist in IIITs.

Now, maybe that is primarily because the fact the technology institutes are considered as the places of highly specialized learning. So, when you come to a technology institute you come to take his specialized degree. So, it is a institute where you on or learn undergo special training whereas, universities are known as the locus of production of knowledge in all disciplines which allows for exploration and critical questioning.

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- In general, they try to remain isolated from the outside world
- Still several IITians have broken out of the mould and taken to activism of various kinds
- Even some have opted out of conventional engineering careers by taking up development related issues
- While appreciating the role of engineers in society and making science useful to society, C. P. Snow asked whether engineer was merely an 'ignorant specialist'
- The mutual ignorance of scientist/engineer and literary/social science person would be disastrous

Institutes has to remodel itself now see suggests that this technology institutes should remodel itself as university, where space is created for freedom to read freedom to think, freedom to teach in respective disciplines. So, that freedom to express oneself through their reading because in university a professor can always express a opinion regarding political happenings, economic decisions taken in the country.

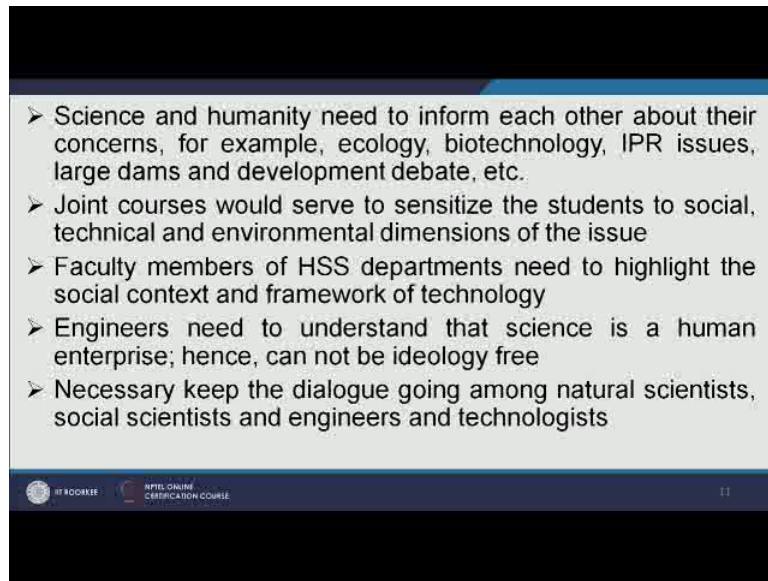
But in the university in the IITs of the technology institutes a professor tries to maintain ethical neutrality that. Freedom is missing according to Ravinder Kaur in in the IITs, and the IITs must provide that freedom to the professors to the faculty members to the students to read, to think, to research in respective disciplines, but at the same time the

universities also has to learn something from the IITs in terms of accountability of the faculty members to the institute to the university, their own responsibility as important instrument instruments of education delivery at the same time the students also need to be more serious about the carrier prospects, carrier goals, which sometimes is missing in the university structure. The students sometimes join university for the sake of joining rather than pursuing the subjects as a carrier goal. So, both universities as well as in IITs the need to learn something from each other.

Now, in that regard while appreciating the role of engineers oh in society and making science useful to the society CP snow, he ask whether engineers were merely ignorant specialists that is other engineers ignorant of the world in which the live and work. Now at the same time such mutual ignorance of the scientist and engineers and social scient science person, it can be disastrous the science and humanity they need to inform each other about their concerns, there has to be some dis interdisciplinary research, that has to be interdisciplinary courses developed such as a course on intellectual property rights which will have people from economics from sociology from environmental sciences from civil engineering, from hydrology there can be a course on environmental studies which will have teachers from civil engineering from economics from sociology from philosophy, to contribute into the from biotechnology contributing to the course module.

Such kind of symbiotic relationship between engineering, natural sciences and social sciences is going to take the academics forward and particularly it is going to enhance the appeal of the IITs or technology institutes many fold. There can be joint courses which would serve to sensitize the students to social technical and environmental dimensions.

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- Science and humanity need to inform each other about their concerns, for example, ecology, biotechnology, IPR issues, large dams and development debate, etc.
- Joint courses would serve to sensitize the students to social, technical and environmental dimensions of the issue
- Faculty members of HSS departments need to highlight the social context and framework of technology
- Engineers need to understand that science is a human enterprise; hence, can not be ideology free
- Necessary keep the dialogue going among natural scientists, social scientists and engineers and technologists

While the faculty members from humanities and social sciences need to highlight the societal context and the framework for technology the engineers need to understand that science is a human enterprise, there must be sensitized to the history of development of science, they need to be sensitized they need to be trained in the philosophy of science, that they need to be told very clearly that science is not ideology free since it involves different human beings hence one cannot remain ethically neutral, but to engage with society engage with other human beings. So, it is essentially very very necessary for the dialogue between the sciences and the engineering sciences and the social sciences to keep going, and that would lead to for the development of not only engineering sciences this, but also the social sciences and also academics and general it is also going to make students a complete human being, where they would be able to appreciate the very world when use they leave and their work.

Thank you.