Details

The course will be broken down into week-wise objectives. Small (about 10 min. videos) will be recorded for each learning outcome. It is expected that about 9-10 videos (90-100 mts) will cover the weeks syllabus.

To remain conneted with the students the Instructor will meet the class once a week. (S)he will discuss the dificulties the students may have with the topics for that week, work out some examples and explain things if needed. Basically, this will help the instructor stay connected with the class and keep the relationship between the students and the teacher. In addition, there would be an online Question/Answer forum and a periodic chat session. These forums have found to be very effective in increasing the student participation and engagement.

It is necessary to continue weekly assessments and tutorials as usual to ensure that student queries are addressed quickly and to enable hands on experience where necessary. Also, problem solving sessions by the Instructor will go a long way in enhancing student understanding and focusing instructor/ tutor energies in a more meaningful fashion.

Initially it is envisaged to have the same number of Tas/Tutors as the regular version of the course during the trial run. In due course this required number of Tas/Tutors is expected to reduce substantially due to the online mode of interaction during chat sessions and automatic evaluation of assignments online.

One hallmark of IITK education is the so called continued evaluation, where we keep-in-tocuh with the students progress and understanding througout the semester. An online medium will contribute to the engagement make this process stronger.

Exams and quizzes will be held regularly as per the norms in existing courses. Mid-semester and end-semester slots will be used to conduct traditional paper/pen proctored exams.

Due to the nature of the medium for dissemination of the course content(videos), it is highly recommended to record the lectures in brief logical modules which effectively capture the attention of the students. A widely recognized standard MOOC procedure is to use modules approximately 8-10 minutes in length. 3-4 such modules can be expected to be equivalent to a typical class room lecture of around 60-90 minutes.

This mode of learning where the (1) lectures are online, avaialble to the student anytime, anywhere (2) The students get to meet the instructor physically once a week (3) The students get to talk to the Instructor, Teaching Assistants and other students over Forums and Chat rooms, (4) Proctored Exams, quizzes, are held as in the traditional course (5) Analytics give a continuous perspective to the Instructor about the students engament and understanding is what we are calling blended mode of teaching.

Monitoring

A monitoring committee will observe the course in progress and ensure smooth running of blended teaching and avoid any major breakdowns in the initial experimental stage. A review after one month and after conlusion of the course, with feedback from all the stakeholders will be done by the monitoring committee. The committee will present its findings to Senate for review and further guidance.

Requesting the Senate Approval for

1. Running four courses on an experimental basis in the blended mode in the academic year 2015-16

   1st Semester

   ESO202A Mechanics of solids – Prof. CS Upadhyay

   ESc 201 Introduction to Electronics – Prof. Aditya Jagannatham

   2nd Semester

   MSO 201a - Prof. Neeraj Misra–Probability and Statistics

   Com200 Prof. Achala Raina – Communication Skills

2. Nominate a monitoring committee to evaluate the efficacy of this experiment and present it to the senate for review and guidance

Subsequent Steps

It is proposed that this experiment be run over two semesters to guage the effectiveness of this technique and to learn the pitfalls and shortcomings. If the experience is satisfactory, it can then be tried out in a larger scale. However it is important to point out that all courses may not be appropriate for this kind of conversion.

The future offering can include

- Short Courses for Industry Participants
- Courses for non-IITK students: build an **IITK Online** brand where IIT Kanpur education is made avaialble to students from all over
- Design a stream of courses which can form a specialisation of sorts like Data Sciences

Summary of the Proposal

How will a course be run

The Instructor will release the course Videos every week
Each Video could have multiple choice questions at random points(middle, end)
Online quizzes will be held at periodic intervals
Questions/Answer Forum for clearing doubts and discussion
Realtime Chat at scheduled times
Statistics will be collected continuously
Instructor will meet the class once a week
Tutorials as before
Exams, Quizzes, Assignments as before

What stays the same

Mid-Sem and End-sem Exams
Assignments
Quizzes
Tutorial
Allotment of Tutors, TAs

What are the changes

One contact lecture instead of three
Videos of the lectures
Online MCQs in the middle/end of each video
Online quizzes
Detailed Analytics to measure the engagement of the student

Logistics and automation support

CDTE will provide the complete backend support for delivery, online monitoring and analytics
NPTEL studio facilities will be used for recording the lectures

Flipped Class Room Blended Mode of Teaching

Course Code: _____ Course Title: _____

Name of Instructor In-charge: _____ (% of teaching)

Co-Instructor, if any : _____ (% of teaching)

Condition, if any for the students:

_____

_____

Syllabus:

Tentative Course Plan:

Lectures: 6 video lectures / week   (7 weeks => 42 lecture videos)

Link to the course lectures:

Week	Topics
1	
2	

3	
4	
5	
6	
7	

Course policy: If any

Signatures of Instructor In-charge

Signatures of Co-Instructor

Head of the Department

Report on the Flipped Classes

In all 7 courses were conducted in the blended mode. The list is given at the end. 8th course is ongoing.

Course Conduct:
1. Lectures were released once a week
2. There was one contact hour per week
3. Quizzes, Mid-semester Exams, and End-semester exams were held as usual

The student feedback for all the seven courses is attached.

Observations:
1. Lecture viewing was not uniform. Most of the students watched the videos only before the exams/quizzes. This seems to be in sync with the student behavior in normal mode classes.
2. Forums were not used much. This improved when the Instructor (as against the TA) was very active in the Forum. Once reason could, the Instructor was available for discussion and hence Forums utility was not high.
3. Those who are negative are strongly negative (by the comments received). But the majority of the students are OK with the format.
4. Students like the option to watch the video at convenience and multiple times(from the comments).
5. mooKIT platform performed satisfactorily. Several feature changes suggested by the students were incorporated.
6. A useful output was the course material which can be (and has been) used in other contexts.

Recommendations:
1. Conduct quizzes every week to ensure regular watching of the videos
2. Send constant reminders, to watch the videos before coming to the class
3. Instructors (as against the TAs) participation in the Forum is strongly encouraged
4. A permanent setup to provide platform support should be created under DOAA

Suggestions:
   Flipped mode delivery of courses may be accepted and encouraged.

List of courses

| Year	Course	Instructor	Enrollment
2015-16/ 2nd	MSO 201A Probability and Statistics	Dr Neeraj Misra	421
2016-17/ 1st	MSO 203B Partial Differential Equations	Dr. Kaushik Bal	538
2016-17/ 1st	ESO 201A Thermodynamics	Dr Jayant Singh	276
2016-17/ 1st	ME 359 Internal Combustion Engines	Dr. S. Khandekar	36
2016-17/ 2nd	CS628 Computer Systems Security	Dr Sandeep Shukla	193
2016-17/ 2nd	MSO 201A Probability and Statistics	Dr Neeraj Misra	450
2016-17/ 2nd	PHY 473A Computational Physics	Dr Mahen Verma	79
2017-18/ 1st	ESO 201A Thermodynamics	Dr Jayant Singh	295

Flipped Classes Feedback Report

2016-2017 1st Semester

Feedback report for flipped class, Semester 1
We have taken feedback for 3 courses.

Serial No.	Course name	Instructor's name	Students enrolled	Responses received
1.	MSO 203B: Partial Differential Equations	Dr. Kaushik Bal	538	160
2.	ESO 201A: Thermodynamics	Dr. Jayant K. Singh	276	139
3.	ME359/ME359A: Internal Combustion Engines	Prof. Sameer Khandekar	36	28

1.I am able to understand the concepts presented in videos as easily as I understood them in classroom teaching
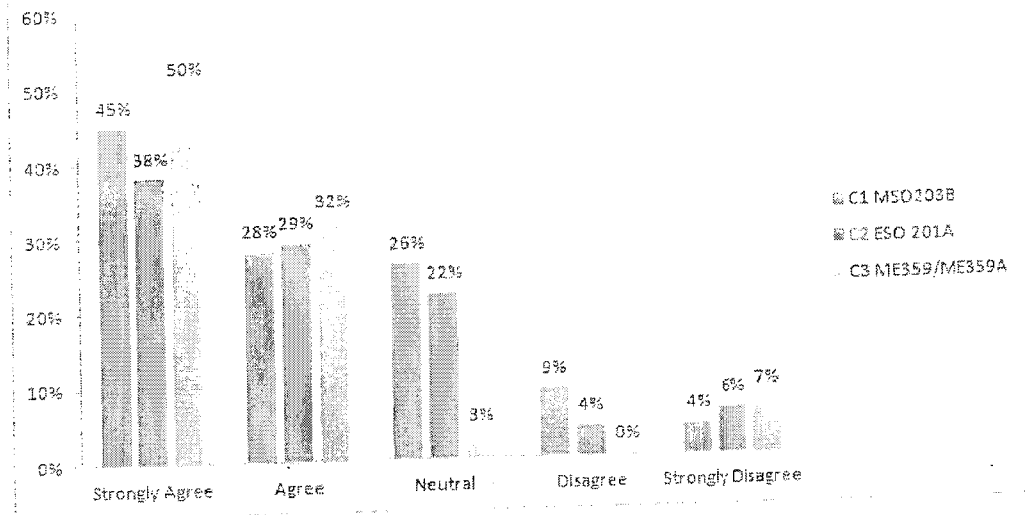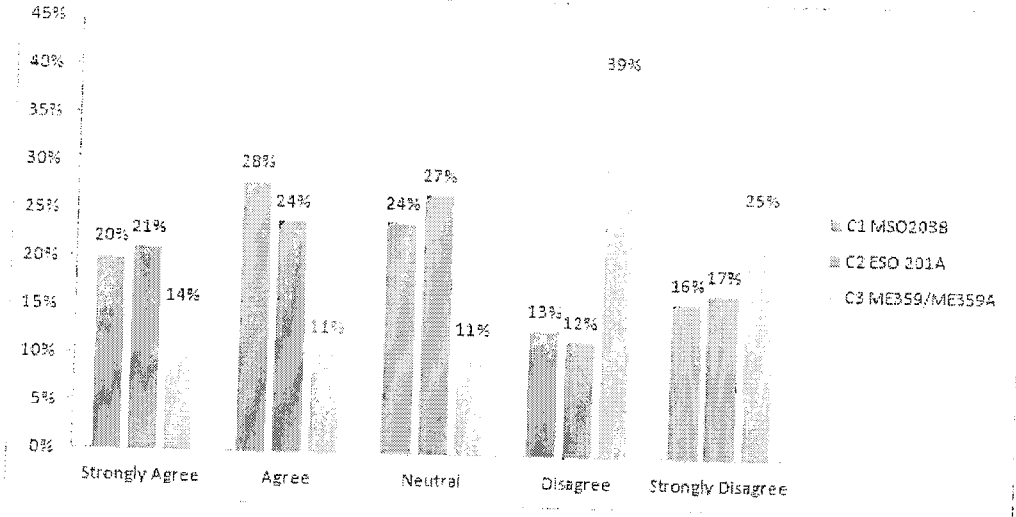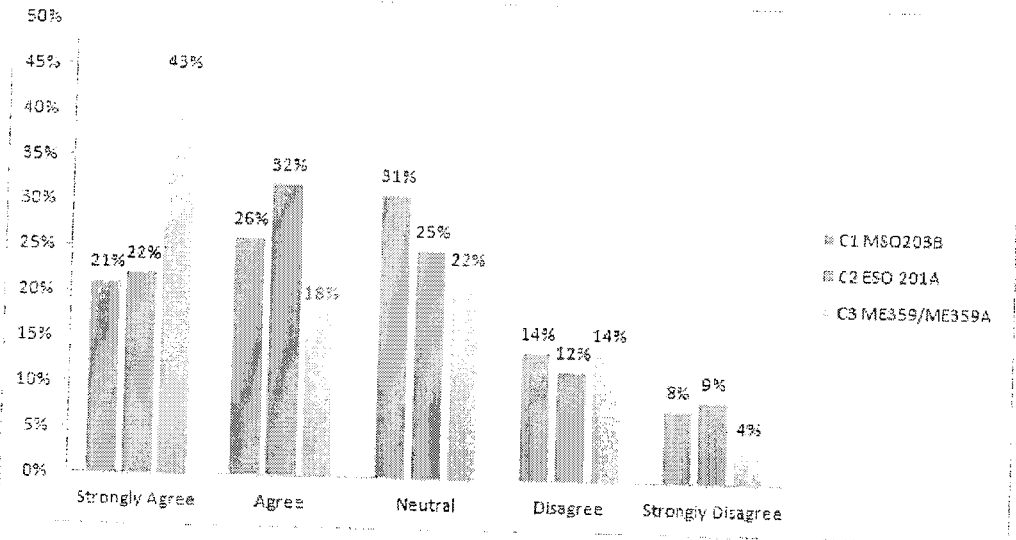

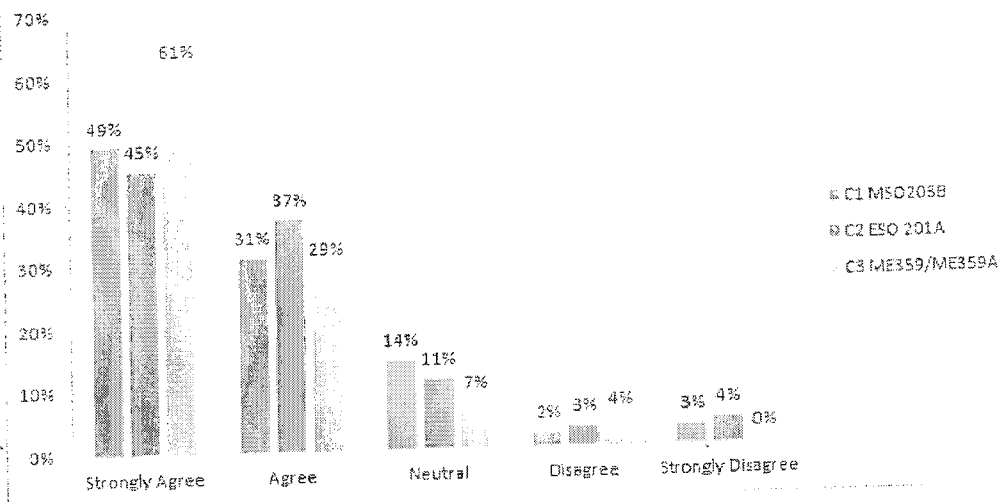2. I am satisfied with the blended course format
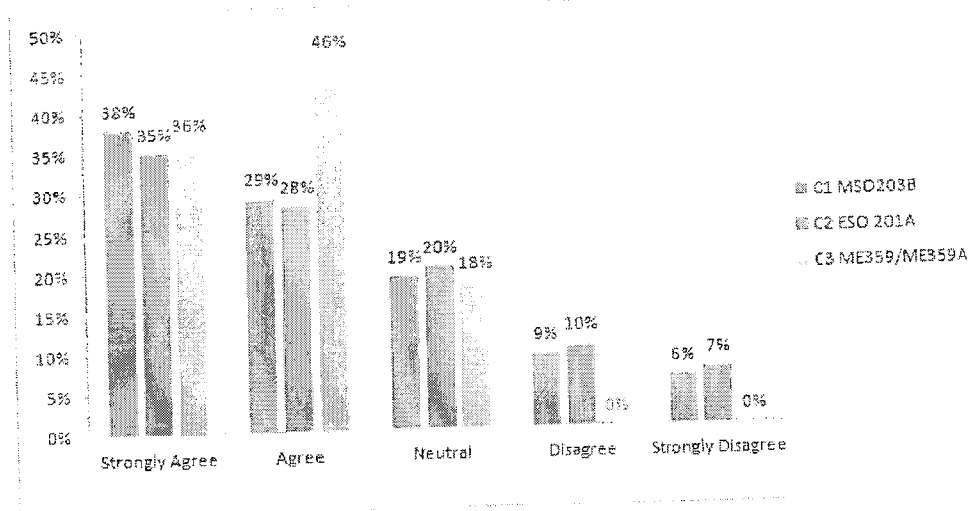
3. I find online forums a more effective way of clarifying doubts as compared to asking doubts in classrooms
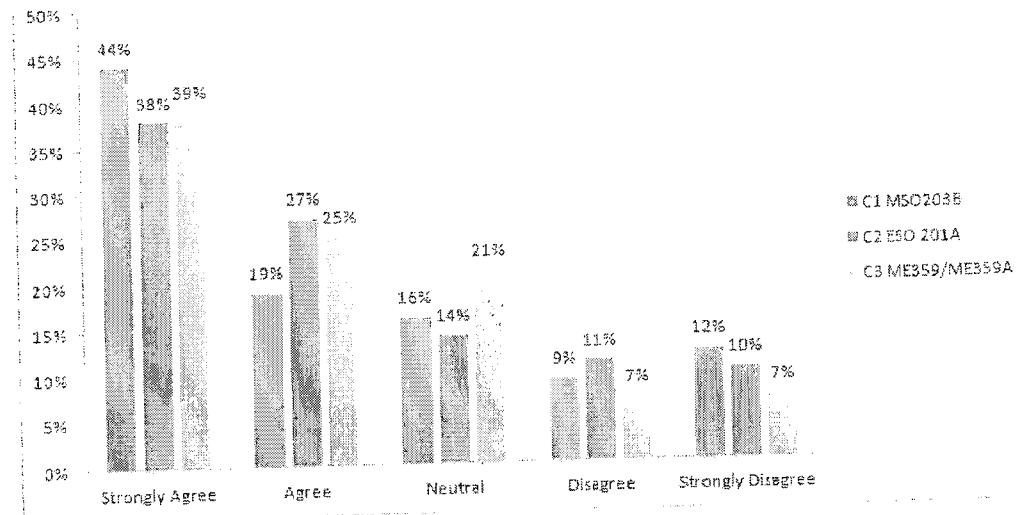

4. I find the discussion hour/online forums and office hours useful if I face doubts in the videos/slides
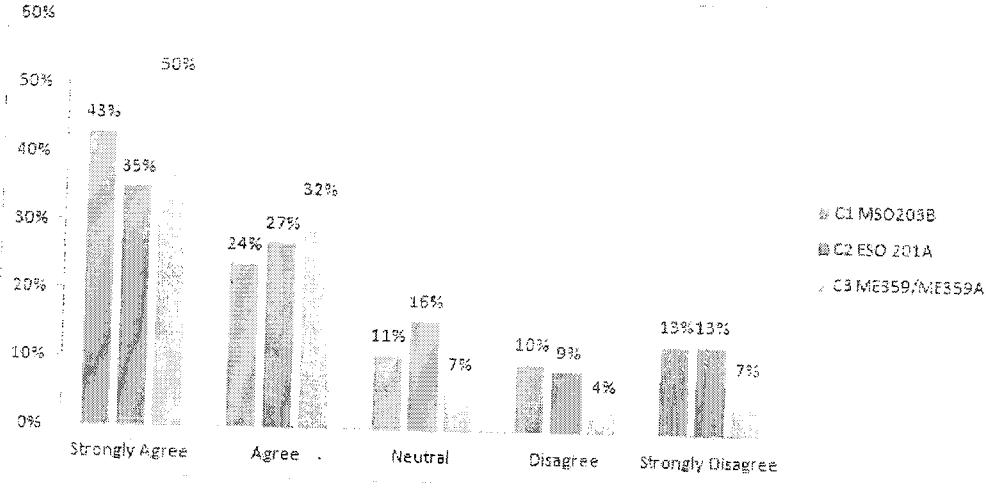
5. I find the online course interface user-friendly and easy to access

6. I think that having video lectures is better than having lectures in the classroom

7. I think that using the blended format for more courses in the coming semesters is a good idea

Legend:
- C1 MSO203B
- C2 ESO 201A
- C3 ME359/ME359A

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
C1 MSO203B	43%	24%	11%	10%	13%
C2 ESO 201A	35%	27%	16%	9%	13%
C3 ME359/ME359A	50%	32%	7%	4%	7%

COMMENTS

Course 1- MSO 203B: Partial Differential Equations

Positive Comments:

1. Hope to see online lectures in other courses.
2. Respected sir, Excellent way of teaching. Best experience ever. awesome. your knowledge. Our way of explaining every little concept. best of all the teachers.................!!!!!!!!!!!!!!!!!!!!
3. I wish that more courses followed this format, viewing lectures whenever we want is a big, big plus point.
4. Good course but lacks some fundamentals
5. Make more courses online.
6. Having flipped classroom enables me to study on my own will....i can go forward ...rewind and go at the pace i wish....this is the best way to understand the subject....and in case of doubts internet is always there...thereby i can explore much more ...study all the concepts deeply....i strongly agree with the concept of flipped classroom and request for more courses to be conducted this way....thanx
7. I think every course should be in flipped mode for our better understanding and performance.
8. Having regular class for maths gives more time and made concepts more clear. For maths   restricting videos to about one hour per week is not a good thing.
9. The overall instruction was good. I liked this as it is useful to clear all your doubts which you don't understand at first by looking video twice or thrice..
10. It will be great if more courses are being taken online like this one.
11. Likewise we have in mso202a which was also taken in same format a challenging problem was updated every week.That is a nice idea.
12. Good and the instructor taught well
13. We gain much in video lectures. We can easily rewind the whole thing when we don't   understand. We can pause and google for some extra stuffs. I strongly support this system of blended format in the coming semesters. Thank You
14. Online course helps me understand the subject better as it allows me to listen to every line the professor says more than once. In the regular classes this can't happen and if you miss something it is more difficult to catch up with the class.

15. Using video lectures are not so good as per me. For example, while watching a video you may get some doubts which you may forget later on to ask. Also, it may not be possible for one to understand the concepts fully as the teacher teaches according to the students in the class!

Negative Comments

1. Return to the traditional way of teaching
2. Classroom teaching would have been better
3. There were lots of mistakes in the slides otherwise it was good
4. Please do not flip the courses of maths .
5. Some topics like classification of PDE (linear,semi , quasi ,non) was not clear so it's

Process and Course Related Comments: good if we have online lectures but as in this course we have one discussion class ,we should have in further courses also .

1. Some theory part was not covered in video lectures. Also new topics were discussed in discussion hours but not given in video lectures.
2. Course content should be more related to solving pde than revising previous topics and classification. Would have been a better course if taught in classroom.
3. A good set of notes such as in mth102 and mth101 would be nice as slides just give brief description of concepts.
4. Should have included some content on application of PDEs too.
5. The course should have a little more theoretical content rather than focusing on only solving the Laplace, Heat and Wave equations.
6. The errors in the videos should be corrected before uploading them, because it creates a lot of problem, if during revision i just watch error part and remember that.
7. There should link b/w everything taught in class
8. There are many mistakes made by the professor during teaching both in oral and written in slides. Kindly try to reduce them.
9. The lectures can be more productive for students if properly explained with more number of examples. I believe that the number of examples given in the lectures are not sufficient and would request the course instructors to introduce more lectures where problem-solving and illustrations are emphasized. Also, lectures should can be more productive for us, if a track record is being kept and small

regular quizzes are conducted throughout the half semester. Please keep in mind that majority of IITK students have a habit of studying just before exams and therefore increasing the number of quizzes (I would suggest you to conduct three basic easy quiz) can make us learn more and give us more opportunity to apply the concepts and be regular with the course lectures. Also, if the grading policy can be made more convenient (remove the current relative grading policy based on average/standard_deviation and make it a singular grade course based on class "median" versus personal score) so that students don't have a negative motivation towards studies and study because this subject is good (and not because its a 6 credit course and you want to land with Rs.30 lakh package) then the real aim of the course would be satisfied. Would also like to thank the instructors for their efforts to make this course successful. I hope my feedback would have helped you in some manner. Maybe you come to know who is the wrote this message (i.e. me) in some parallel universe and would thank me for writing this feedback. Thank You Have a great day! :)

10. Video has to be uploaded on time, and lecture slides, assignments and solutions must be made available to us on the forum on time.

11. The videos should be released as per the weekly schedule of classes rather than putting all of them up on some particular day of the week. The tutorials and discussion classes should take place on Monday and Friday respectively.

12. More content should be covered

13. Sites should be available in nights also.

14. Mathematics courses must be taken in the conventional ways. Courses like ESO208 will be better in the flipped mode.

15. In an attempt to make short videos professors tend to shorten the explanation by simply saying you must have read it here and there e.g. MTH101 and a student who was weak in that course would have to suffer this course also, on the other hand in classroom, professors teach with more flexibility and freedom and are open to discussion. I strongly disagree with flipped classroom method.

16. It should be compulsory to submit assignment (some weightage should be given)

Course 2 - ESO 201A: Thermodynamics

Positive Comments:

1. The flipped course was a very good idea and I hope to see it in other courses.

2. This course is quite interesting and this online course format was really helpful for all the students. The only problem regarding this is that all the students don't see the video lectures regularly (i.e. before coming to class) and thus the one hour discussion period becomes ineffective. If this course is taught in nest sems as regular class system then also the link of videos should be sent to students so that students may get access to the course content and all the concepts whenever they want. And this will be quite beneficial for those students who don't attend the lectures due to some reasons and if this course is taught as flipped classes the instructor should focus on specific concepts involved in videos released that week and questions related to that topic. That's all about it. By the way our instructor-in-charge of this course taught very well.

3. I personally liked the blended form as it gives you flexibility to do your whole week study in a day which we IITK people are used too.

4. The idea of flipped classroom is very good and it should be used to allow students to take other courses in the same slot in timetable as used in colleges like Stanford.

5. This course required us to understand the topics well and the online lectures have helped me to do that which I believe was not possible with the regular classes where you can listen to the professor only once.

6. I think that using the blended format for more courses in the coming semesters is a good idea

Negative Comments:

1. Return to the traditional way of taking the course. This should be discontinued as soon as possible.

2. The flipped classroom session was of not any value. Essentially this course can be boiled down to the study of a book, a very good book in fact. I feel that the mooc can be restructured to involve time for book reading and remove the flipped classroom session.

Process and Course Related Comments:

1. More time should have been given to the Rankine cycle and the thermodynamic property part. A lot of time was unnecessarily spent on topics that were too easy, and the exam came only from the later topics which needed more time to be understood.

2. If the exams were fully subjective, then I think marking would be fair for us. Like I solved full question correctly(on rough page) but did some error in calculation and answer came wrong,for this what i got is 0/50 for that question.I felt that discussion class were useless, as everything of video was repeated again...we attended the classes just attendance.Tutorials are sufficient enough.But video lectures are very helpful.

3. The blended mode course with regular assessment such as online quiz etc would have more impact than the regular lecture based course.

4. In regular class room ,sometimes we have some fun with the instructors and that helps to make bonding with them and many concept ,we remember by remembering the moment which had happened in that particular class of that topic . But flipped classroom provides many facilities like if we are not able to understand a concept or sometimes we get bore with that topic ,we can easily access that video after sometimes when we are in fresh mind . Sometimes we leave the class due to some reason especially when the class is schedule in very morning so for those courses ,it is best way of teaching . But , tutorial must be helpful . If problems are encouraged ,and we do them honestly ,we get more advantage of the course and it would be very helpful if our tutors give some time to discuss the concepts apart from question discussions .

5. It would be much better if algebraic expressions in the final answers of the questions are asked to find out rather than using the tables and numbers all the time. And if you ask the answer in terms of algebraic expression then the level of difficulty can be increased because the time that one person takes in solving numerical problems should better be used in some critical physics thinking.

6. Length of the video can be increased to provide a deep insight into the matter The objective should not be completing the syllabus but rather more focused on understanding of concept.while giving an example the aim should not only to get the answer but also to have a deep analysis of the problem irrespective of what problems is asking...Thanks

7. Any substitute for regular lectures should be judged on the basis of nature and requirements and content and objectives of a particular course.This format can not be implemented to every course.

8. If more mini quizzes have been conducted then it would have been better.

9. The topics should be more elaborated in videos and instead of lectures small doubt clearing sessions should be there for each bach.

10. Grading should be process based not answers based.

11. A daily challenge problem could make it more entertaining

12. a) Instead of 1 discussion class in a week, there should be 2 tutorial sessions, as it is easier better to ask questions during a tutorial session, where no. of students are relatively lesser than that in class. b) I don't understand the concept of making attendance compulsory in the discussion class, as it is not necessary that doubt of one person is also the doubt of whole class, but because the attendance was compulsory, so maximum people have to be there in class.

13. This course should be taught in classroom.

14. It should work 24 hrs : At 12 midnight website got off i dislike it.

15. It does not works at night in halls.

16. Please use the mouse spotlight or similar functionality .It will help us where on the board,the professor is pointing at while explaining certain thing. It will only make this whole platform better.

Course 3- ME359/ME359A: Internal Combustion Engines

Positive Comments

1. I really appreciate the efforts the instructor had put to make these lectures and this flipped mode was extremely helpful as i can watch the lectures to my convenience. Additionally if i felt like going into more depth i can do it in parallel by simply pausing the lectures and then resuming again. It would had been great if the lectures taught in class were also put in the video format as sometimes it gets bit confusing to find the link b/w taught in class and lectures if you miss a class that i did often. overall flipped mode concept is great and it works well with me.

2. Making it for all the classes is not good but making it one or two courses per student will reduce the load for student and increase the efficiency as he can learn from the videos if he miss out something during that week because of other schedules. I found it useful.

Negative Comments

1. As per my opinion, Flipped classroom course is not a better approach to look forward. Instead of this, a regular classroom is more visual, understandable, provides memory mark to grasp the concept and importantly helps to connect the Instructor and students.

Process and Course Related Comments

1. Since it is imperative that internet is required for use, it would be a good idea for the lectures to be made downloadable. Also there should atleast be a discussion hour devoted to what is taught and the course should not be made exclusively online.

2. It will be good. If you will provide some practice problems also along with video lectures for practice. Unless it is very good technique for teaching the courses. thank you.

3. Should also include stuff like Online Test, Quizzes etc.

4. This system needs some more modifications. Pace of instruction is not even. moreover the interaction during class hours cannot be replaced by any video lecture format. classroom teaching is better since one can write as well as take notes simultaneously. forums are good for discussion but post classroom discussions are better. it's a nice initiative but unless videos are prepared as per classroom instruction pace it loses out. a much rational and better way could be to do recording of live lectures during the next semester and use it for the subsequent batches.

5. If possible reduce the syllabus of this course. It's too vast to complete in a single semester.

Classroom discussion is very important for the learning curve of a student. You can make such lectures as they are very useful in revising. But what a student learns in class is much more than the theory of a subject. He learns the way of life from his guide, his teacher. So classroom discussion is very important and we should not lazy and remove this art of teaching. Video lectures today can be found on almost every course on the internet but there is not one of them that compare to a class. The effort that you are putting in is good but I think you are trying to replace a very important thing which if successful will not be very good for the learning of a student. We surely don't want to make robots leave IITK campus. We want students who have learnt the art of living from their professors and have this very important skill that they can carry forward and teach the coming generations.
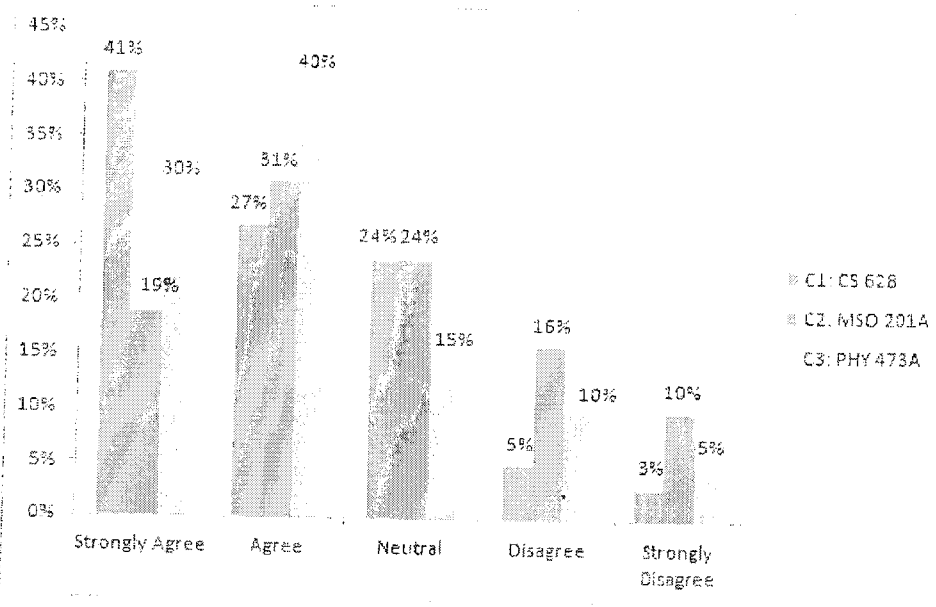
Flipped Classes Feedback Report
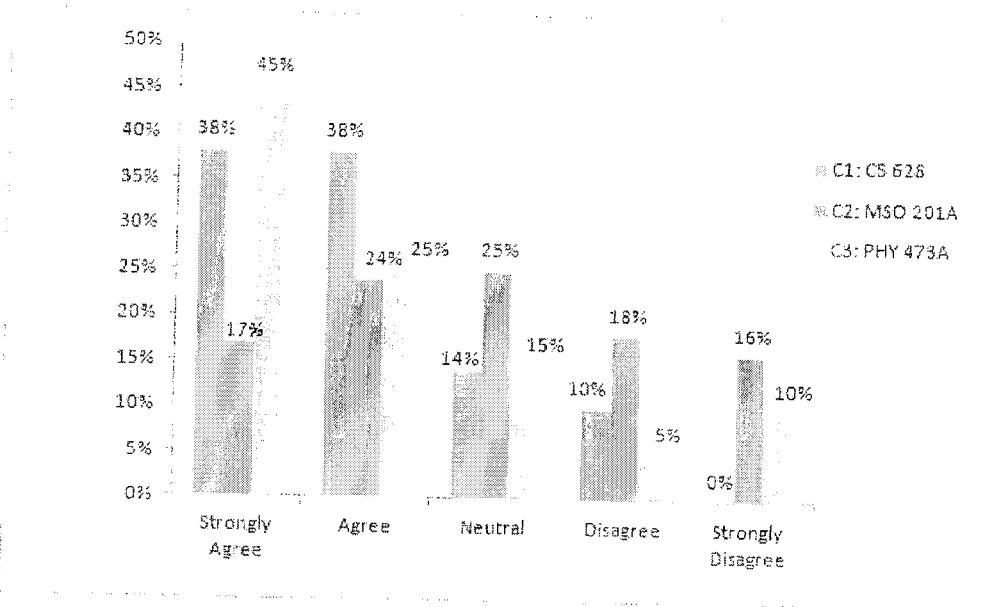
2016-2017 2nd Semester

Feedback report for flipped class, Semester 2
We have taken feedback for 3 courses.

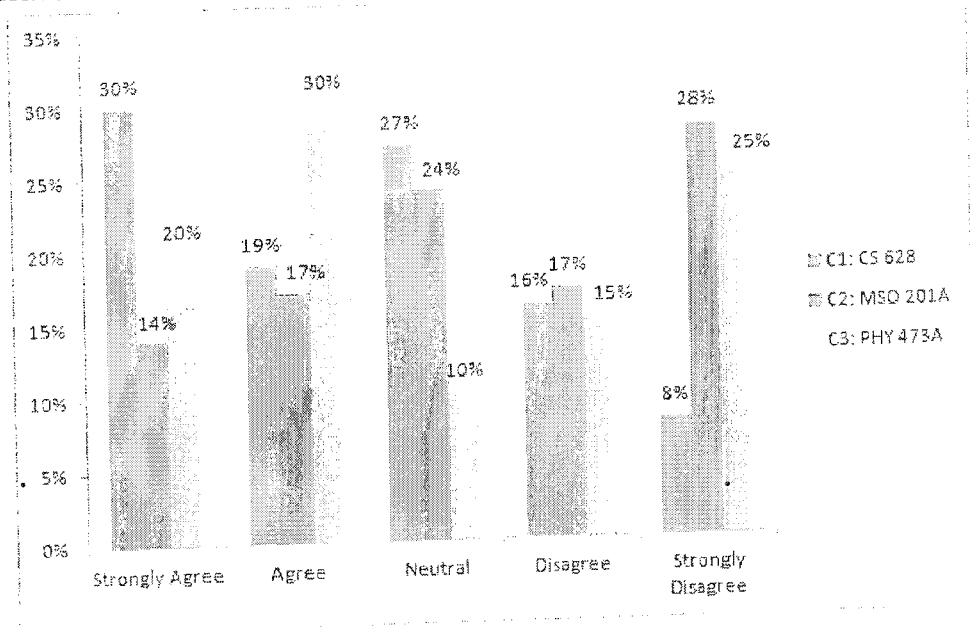| Serial No.	Course name	Instructor's name	Students enrolled	Responses received
1.	CS 628: Computer Systems Security	Prof. Sandeep Shukla	193	37
2.	MSO 201A: Probability and Statistics	Prof. Neeraj Misra	450	134
3.	PHY473A: Computational Physics	Prof. Mahendra K. Verma	79	20

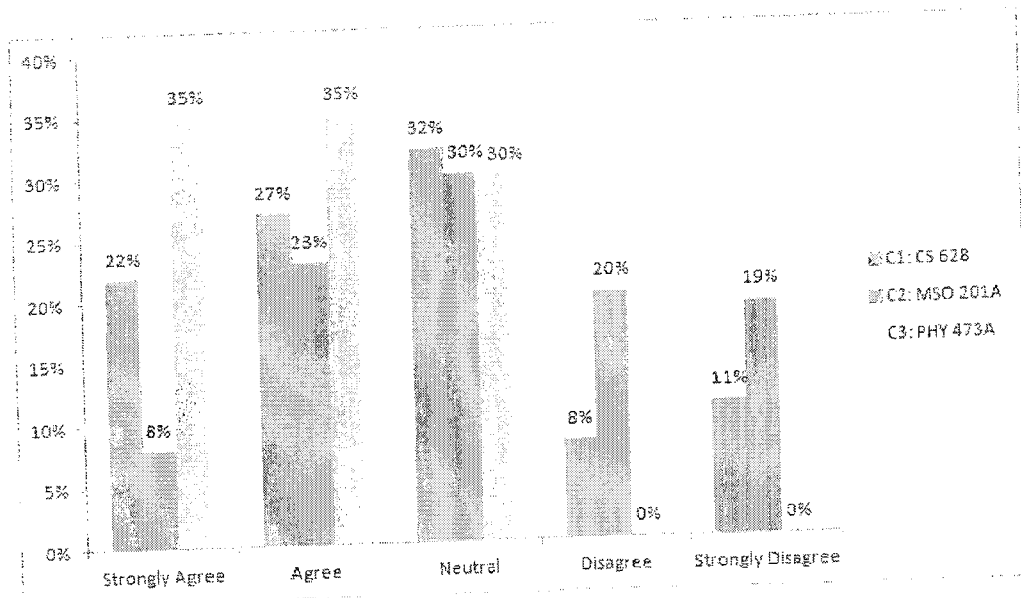1. I am able to understand the concepts presented in videos as easily as I understood them in classroom teaching

Legend:
- C1: CS 628
- C2: MSO 201A
- C3: PHY 473A

2. I am satisfied with the blended course format

Legend:
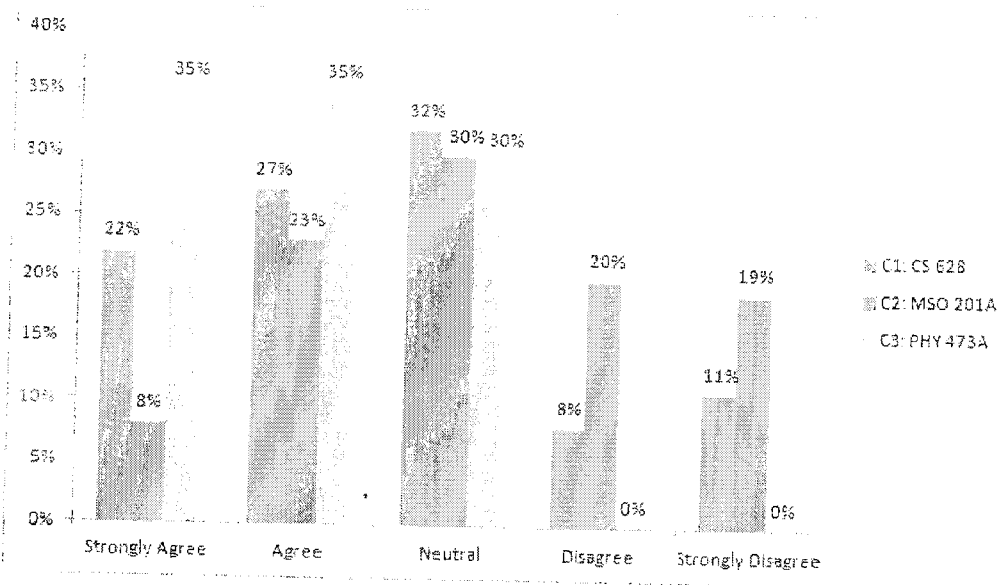- C1: CS 628
- C2: MSO 201A
- C3: PHY 473A

3. I find online forums a more effective way of clarifying doubts as compared to asking doubts in classrooms
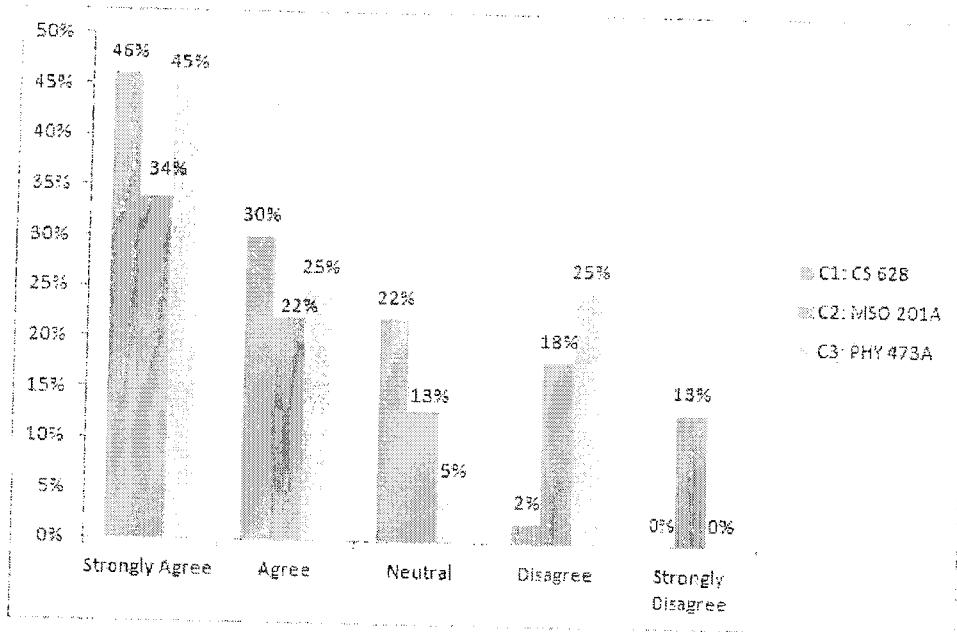

4. I find the discussion hour/online forums and office hours useful if I face doubts in the videos/slides
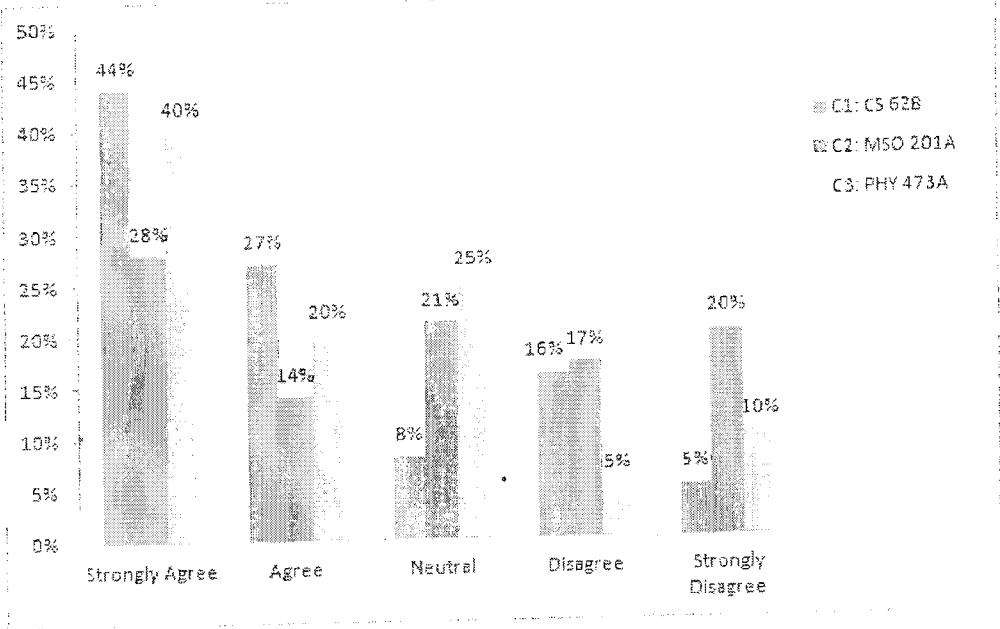
5. I find the online course interface user-friendly and easy to access

6. I think that having video lectures is better than having lectures in the classroom

7. I think that using the blended format for more courses in the coming semesters is a good idea

C1: CS 628
C2: MSO 201A
C3: PHY 473A

COMMENTS

1. Course 1- CS 628: Computer Systems Security

Positive Comments:
1. It was alright. But I expected more.
2. We can listen same content a number of times
3. It was a good experience and I learned a lot.
4. It was a good learning experience, and platform is very good and user friendly

Negative Comments: Nil

Process and Course related comments:
1. Server gets unreachable outside cc network after 12pm. It should be fixed
2. user interface needs improvement.
3. discussions/questionnaire may be carried out in class post video uploads.
4. Please provide some sample questions and answers whose concepts will be used for the assignments.

2. Course 2- MSO 201A: Probability and Statistics

Positive Comments: Nil
Negative Comments:
1. I have been through two more flipped mode course but the way of teaching of those professors in flip mode were quite good. I strongly suggest to not offer MSO201A in flipped mode. It is a very interesting course but flip mode made it boring and compulsory only.
2. When the classroom teaching was meant to be flipped, I found no point in having attendance in the classroom session. It increased our load as we were supposed to watch the videos before coming to class and then participate in the classroom too.

Process and Course related comments:
1. This format is compatible only if instructor is able to understand which part will be difficult for students and not just monotonously reading the bullet points and speaking a few similar sentences. Videos, which are just like reading the slides in unnecessary quest to cover more new topics, in no way help the cause. I would suggest that besides long videos , there should be short but elaborate videos on each sub-topic within a video along with a

variety of example all discusses in a layman way. This will help those students also who need to spend some time over the new topics to get it . At the same time it will not kill the time of those who readily get it as they can continue with the current-style videos .

2. Classrooms must not be meant for assignment problem solving. More problems must be solved online.

3. Please use better notation, better slides and more. The videos should involve more than underlining the slides. Moreover, the explanations should be better. Results derived from measure theory should not be forced in the course. Moreover, the course should involve less practical use and more theory. The theory part is way stronger, but practicality has many approaches and a lot of theory is lost during question solving. Rigour should be increased. Basically this course was shit at this stage and a waste of time for atleast some students. The aim should be to make it worth people's while. Courses should not be undertaken as per the worst student, but be taken as would help the best student or 10% of the students just below him. Not the worst ones. Difficulty was trivial and grading was done on basis of topics that were shit.

4. There was no point in watching the videos because all that the instructor did was read the slides. Also there were LOTS of mistakes in the slides and the worst part was that these were never corrected. Sometimes even the instructor did not noticed them.

5. As far as the interface of mookit is concerned, it sucks. Why do we have to sign in after every few minutes? And the modules should be minimized in the start interface. It is really annoying to scroll all the way to the bottom every time.

6. The professor should regularly give answer's to the question asked in online forum.

7. You can never teach a math's course online! It is a very bizarre idea, also course content was so so dull! I don't know how could you claim that last time students were happy with this blended mode. Also prof was super duper uninterested to teach us i would say. Never did he tried to relate it to physical world. We were just dragged along to mug up all the formula somehow apply them and just that. You people need to understand that one needs perfect sync of physical feeling and theory to remember it and apply it. All students do while doing even exams is do previous questions and just mug up standard results and techniques. Take a viva someday and you will see it. You are strongly degrading quality of education by such online thing.

Also book! Its total mess. Do ask prof to read it before he recommends this "standard" book.

8. Also this prof didn't do any board work just used that pen and wrote in most illegible handwriting. Very hard to understand solutions equally. Please encourage board work. Next your software, on which prof are asked to write,(not your MOOK UI) how distracting the interface is! You need drastic improvement there also.

9. Also course content is too much, reduce it please. Please take as positive but yeah critical criticism.

10. This course is fraud in the name of 'Flip Mode'. We have to go for the same number of classes. This was just an excuse to cover more syllabus than the professor possibly could have in the physical classroom.

11. The course doesn't really focus on intuition. It is probability without a spirit. I realize that the professor in physical classes stresses upon this issue more but still the challenge is to bring it back to video lectures. I compared the series to MITOCW videos and they have more life than ours. Our course content is very rigorous theoretically, twice as theirs is but still their content is more about intuition and applications of probability. In short we must try to keep the same content, introduce some more statistics probably and make the intuition part better. As for the system, I don't have any issues except that there are some security issues with the system.

12. length of videos should not exceed 15-20 minutes.

3. Course 3- PHY473A: Computational Physics

Positive Comments:
1. Course was nice
2. I am very satisfied with the blended course format. Because due to this online video classes we can see the videos as many time possible but in the classroom we can attain one class once in the whole semester. So thanks to IITK to provide this type of fascility.

Negative Comments: Nil

Process and Course related comments:
1. The office-hour duration should be increased .
2. there are one day in a week for problem , I had need more time to solve problem in a week
3. Example codes should be properly commented. This will save our time .
4. Of course the video quality and sound quality could be better,besides that, nocomplaints.

In the Academic Year 2015-16, IIT Kanpur offered MSO201A in a blended MOOC mode.

Instructor's Comments

The course was conducted in flipped classroom blend mode in which typical classroom lectures were not delivered; rather short lectures (of 20-30 minutes duration) were made available to students through videos that were available online. Generally each video dealt with either a single concept or a part of single concept. Students were expected to view these videos of their own before flipped classroom sessions (also known as discussion hours) which were held in physical classrooms. In flipped classroom (held in one session of fifty minute every week) students could discuss their doubts, problems or any concept related to the course. In addition to flipped classroom session, there was one problem solving tutorial session of fifty minute every week where tutors solved some carefully chosen problems to explain certain key concepts. Tutorials were also conducted in traditional way in physical classrooms.

Every Friday evening three to four videos (of total duration of between 70 to 90 minutes) were released for the following week. Students were expected to view these videos of their own before coming to discussion hours and tutorials.

Teaching the course MSO201a in flipped classroom blend mode was a wonderful experience. With changing times I would recommend experimenting this mode of teaching in other undergraduate courses for the following reasons:

(i) This mode of teaching emphasizes more on learning rather than passing the course. The components of discussion hour and tutorials can be very useful in achieving the goals of effective learning.

(ii) I am of the opinion that undergraduate courses should be taught in a structured way where relevant course material is easily available to students. This is important because in most undergraduate courses they are
exposed to the subject for the first time. Availability of video lectures and lecture slides are very useful to students to revisit various concepts at their convenience.

Through some students I was also informed about some negative aspects of this mode of teaching:

(a) Some meritorious students found discussion hours not very encouraging. They complaint that most of the time in discussion hour was spent in explaining things already available in video lectures and lecture slides. They wanted some additional classical topics (like some open problems; history, etc.) to be covered in the discussion hours. One needs to explore ways to fulfill the academic appetite of meritorious students without compromising on the needs of other students. Maintaining a proper balance between requirements of different set of students is a challenge.

(b) Some academically weaker students complaint that this mode of teaching makes them further lazier as, because of easy availability of course material, they kept postponing their studies/learning. These students are
of the opinion that traditional classroom mode of teaching pushes them for studies/learning and is therefore preferable.

In view of the above I would recommend the following for effective implementation of the flipped classroom blended teaching methodology:

(I) To encourage students to attend discussion hours some random short quizzes (if possible online through mobiles) may be taken during discussion hours. Moreover during discussion hours some classical problems
be also discussed which will encourage meritorious students to actively participate in the discussion that will lead to quality learning environment;

(II) To encourage students to go through the study material regularly more pen and paper quizzes be taken during tutorials. I would recommend at least 4 quizzes (two on each side of mid-semester examination).
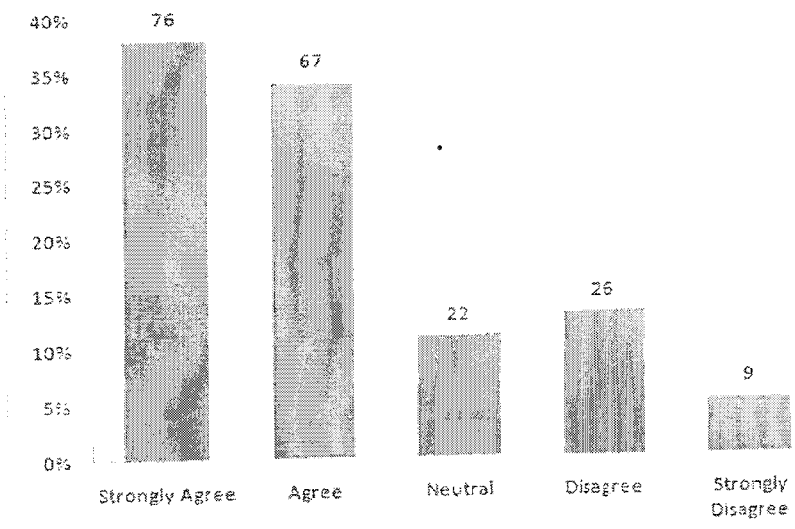
Students Feedback

A feedback form was circulated in the first week of April.
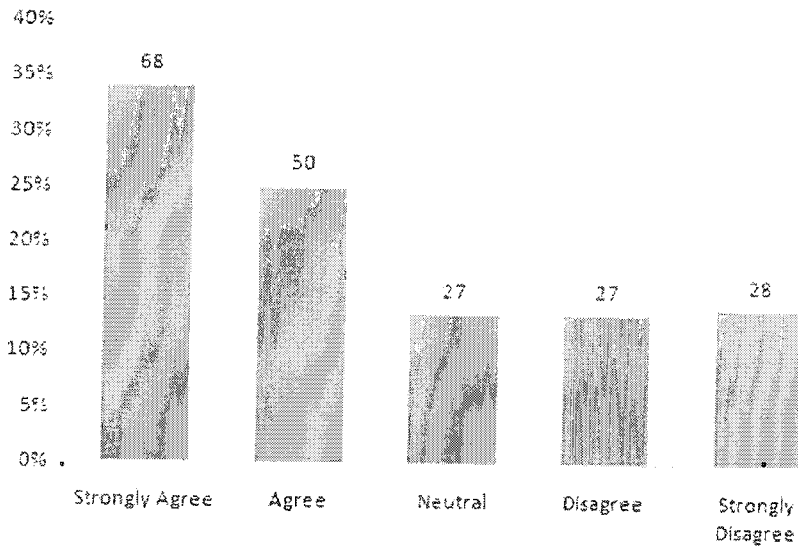No. of Responses Received : 200

Survey Responses

*** Data labels indicates the total number of responses received for each option*

1. I am able to understand the concepts presented in videos as easily as I understood them in classroom teaching
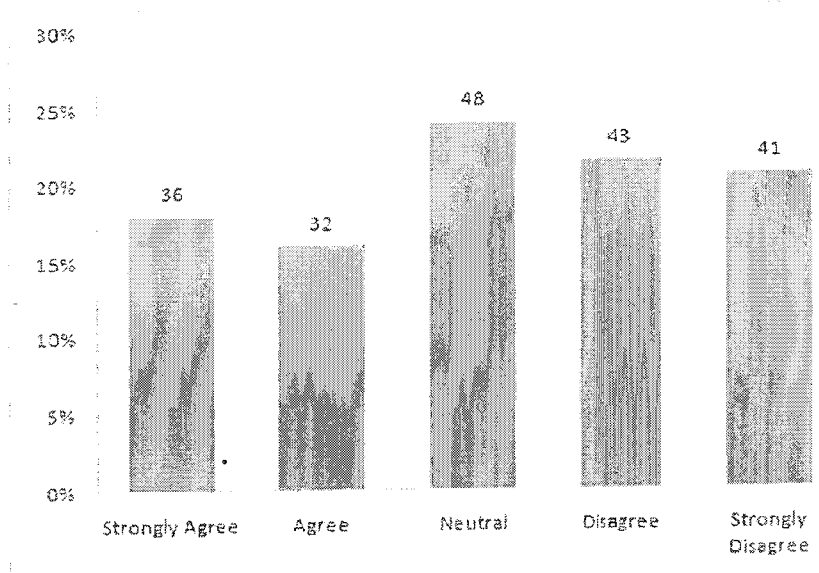
2. I think that having video lectures is better than having lectures in the classroom

3. I find the discussion hour/online forums and office hours useful if I face doubts in the videos/slides
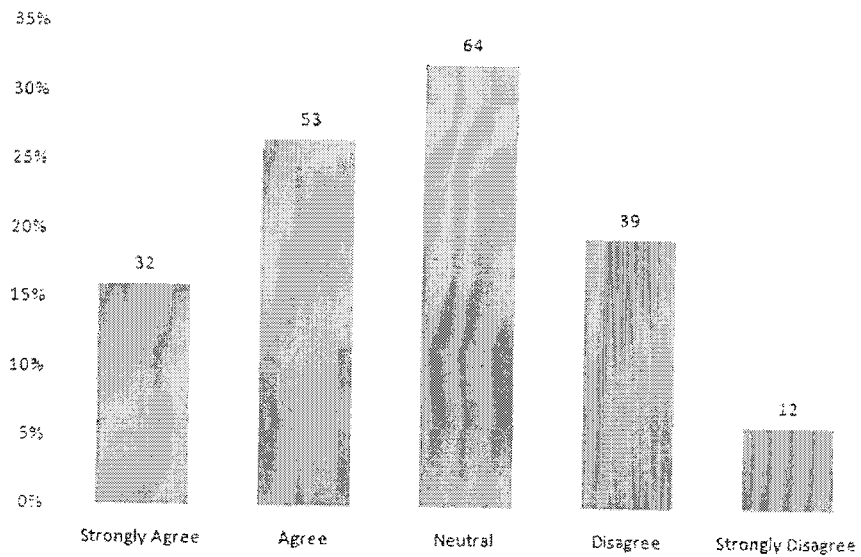
4. I find online forums a more effective way of clarifying doubts as compared to asking doubts in classrooms
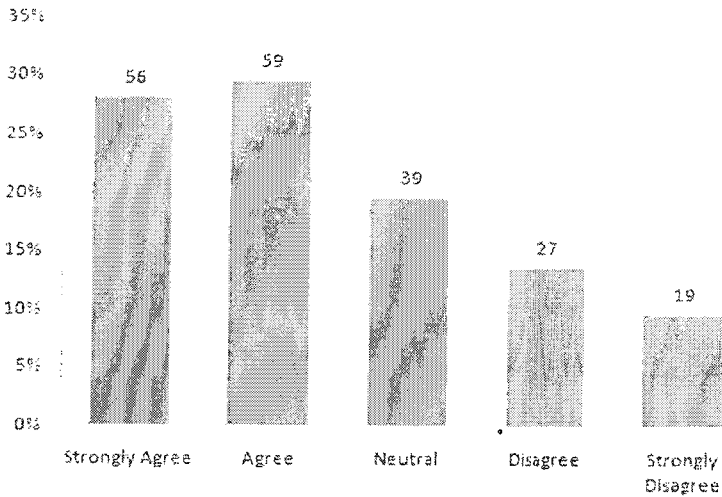

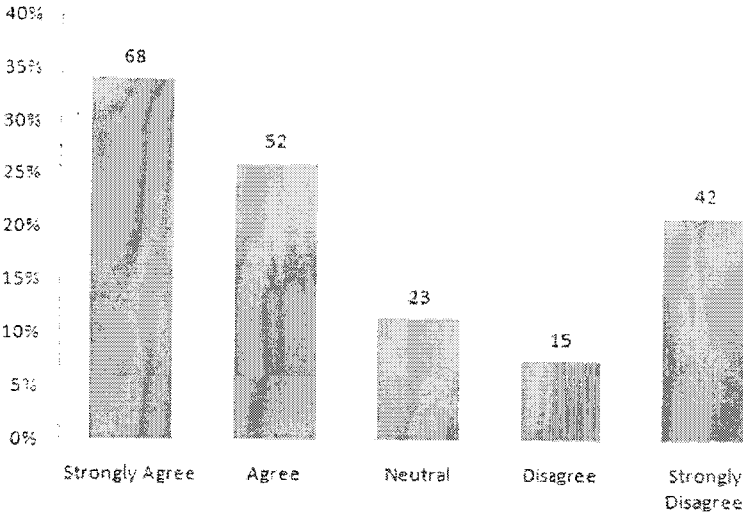5. I find the online course interface user-friendly and easy to access
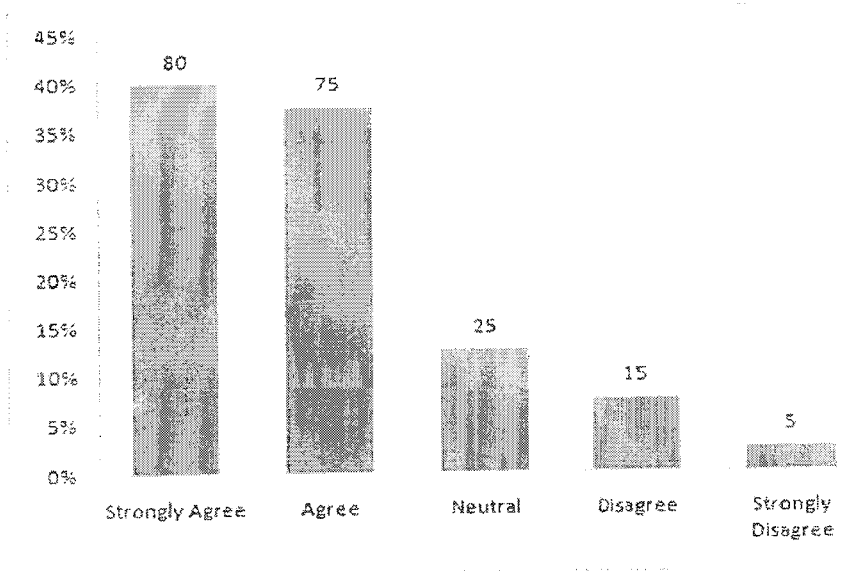
6. I am satisfied with the blended course format

7. I think that using the blended format for more courses in the coming semesters is a good idea

Comments

Positive Comments

1. I am an average guy, a 7 pointer, I do not attend any classes generally and video lectures was like an elixir. This way, I grasped most of the concepts as I was not bound with the time of the class, I accessed lectures anytime. It was really a great experience and I would love to see this format in other courses as well provided with more number of discussion hours per week.

2. Loved the flipped classroom program. It is very beneficial as we can watch the online videos again and again by rewinding if we have any doubt, which is not possible in classroom program.Looking forward to see the more courses having the online videos course format.

3. Kindly keep up this format of the course.

4. Please continue this flipped classroom method of teaching. It allows students to study at their own convenience and greatly improves efficiency of learning. It also saves us a lot of time.

5. Flipped classroom system must be continued. It's one of the most successful experiments IIT KANPUR have done so far.

6. In my perception, there must be weekly quizzes or something else to insure that students are with the course. I saw many of my friends watching videos collectively after long gap or just before quiz. As the number of courses in this format increase it may become difficult for students to cover collectively which may leads towards lost of course purpose. But anyway this format is much better than regular classroom.

7. Nice thing we have all the lecture . the best thing of this format is that we can see the topics at any time like a classroom lecture thank you

8. I strongly recommend this mode of teaching

9. Try and bring the format into more courses, it is extremely helpful , you can watch the videos any time even before the exam if you face doubts which is a big plus when compared to normal system of teaching.

10. Its great to have this flipped classroom system as whenever we have a doubt, we can just look back in the lecture anytime whereas in case of normal classes we can't. Loved this system Please keep it for coming system and introduce this in other courses also....

7

Negative Comments

1. I am completely against the idea of flipped classrooms. What is the point then of enrolling in the college? I could have watched videos of NPTEL or any other college from home. The advantage of having great faculty is that we can have interactions with them and that is greatly reduced due to flipped classrooms.Specific kind of students like me who would normally attend classes have not attended discussion hours and spent time solving their doubts.Though that is good , it can be taxing and also the instructor's view is invaluable. I have leant a lot by asking doubts after lectures but that component, I felt, was missing in this course. However, providing lecture notes, assignments, forums etc.. online in a neat form is a welcome initiative.

2. I found this course interesting but i think I could have done a lot better if taught in the traditional way.

3. Why come to iit if we have to study like this.There are many online course available like mit ocw.

4. Please Switch back to the more traditional way of teaching!

5. Flipped classroom must be flipped. We should get on to the normal classroom format for a subject like MSO i guess

6. The pace of normal classroom teaching suits the average student as much as it does the ones who have a sharper brain. With the course being converted into video lectures, too many concepts are being covered in a really short time. In conventional classrooms, we can tell our teachers where it starts to get too much to understand but with the videos, we have nowhere to go. Many of my classmates are facing the same problem as we are not able to grasp the concepts this fast. Also, doubt clearing on forums is not effective as we have to wait for someone to answer and the teacher-student interaction has decreased as most of us do not go to discussion hours. The reason for lesser attendance in discussion hours is again this new system itself. Since we have so much to study (the course pace suddenly got faster than ever after midsems, and that is when the attendance dropped the most), we are not able to watch all the videos by the time of the discussion hour, and hence there is a feeling that without watching the videos, we won't understand much in class. I think the conventional classroom method is better.

7. This is a totally worthless idea.Besides this way the course content is being covered more and more without the students actually learning anything.So please do not use it in future.

8. Instead of video class lecture is better.

8

9. I want regular classroom lectures because that was the reason for me to go to classes regularly and it helps me because then, I was in more touch with this course but now I pay attention to it only during exams time. I strongly recommend a 10 minutes mini-quiz in every tutorial at the same level of Mid-sem or End-sem exams with some weightage.

10. a)Too much content: The Professor could not have covered so much in usual classroom system. The videos were posted even during the mid sem week. I hope the course has just 14 weeks of content only as per the number of academic weeks. b) I am not very comfortable with the the video system.

11. Sir, The website and the course is very well built, and everything required is easily accessible but I think this format is making the student lazy. Most of the students (including me) would postpone studying MSO to complete the other courses and proper time isn't being given to this. The videos are being watched just before a test or an exam. While most of the people do not have a problem with content, no one is exploring the content beyond the course, as they don't spend time for this course. Regular classes makes the load uniform and people are generally up to date with what is happening. If courses are designed to make people get interested in an area and help them dwell deeper I think this is defeating its purpose.

12. Initially I found this method to be good but later as time passed I started developing dislike for this method. Reason:- When teacher used to teach in class, I used to attend every class and make notes, and during exam I only have to revise those. But now I am watching all videos before exam which makes it difficult. This is case with most of the students here as you might observe that number of students watching videos before exam sometimes crosses over 150 while on regular days sometimes only I am online. Though I found that my doubts were cleared more effectively via this method and this new concept of teaching seems to please me, I still believe that earlier method was better.

13. More (classroom) lectures are required, I feel online lectures are not helpful

14. There is a long communication gap between the instructor and the students because of the flipped classrooms. However, the videos of the professor explaining all the lectures are helpful for a student to revise concepts thoroughly at the time of exams but this does not support the cause. It is better to go to the classroom and being taught by the instructor live. A student cannot ensure watching all the modules before a discussion hour and hence cannot ask for doubts, instead when a student attends a class he/she is attentive for an hour and is in sync with the professor and can ask for queries and doubts. So I strongly recommend to discontinue this

method of teaching in the upcoming semester, while providing them with video lectures is pretty much good for them.

15. I used to attend all classes in normal classroom but in this flipped class method i wasn't able to was videos bcz of no time restriction to watch and then missed discussion hour and then vicious circle continues

16. Use of blended format may not be good for all subject.

17. Hope this feedback is not going to affect my grade. I found this type of format very bad in terms of learning a subject. The most important thing we need in learning a subject is interaction that we have in proper classroom. There is no interaction at all in videos, just see a person saying something continuously. Initially I watched every video but with time lost the interest at all. I know this is the case with more than 80% students here. We can get good marks but can't learn the subject.

18. Just one more point that I feel should be considered:- While having online blended courses like this one is not a bad idea but one should also consider the **increased exposure to laptop screens due to such courses.** Also, these days most of the material to study is available in the soft format. It isn't like one can't print the material and read, but often that does not happen because material is already ready to be read on laptop screens instantaneously. Pushing it further by having online lectures increases strain on eyes. Personally, exposure to laptop screens is a big problem for me as I often suffer from dry eyes. That's why I try to minimise my time spent on laptop. **Apart from it, true and active note making that happens in live classes greatly increases the retention of concepts taught in class. While things are understood through this medium as well but we tend to forget things easily.**

19. Please never ever try to apply this method of teaching to any other course ,as we have are completely ruined by this method in course MSO201

20. Due to course is running online most of us not able study it regularly only at the time of quizzes and midsem people see all videos lecture in one or two days, mug up everything and manage somehow in exam which demotes the aim of teaching. i think that classroom teaching system is more beneficial than that.

21. I feel that such methods should only be used in courses taught on slides. I feel that students understand more when professor himself teaches in class. It is not easy to ask enough questions to clarify one's doubts in the class now than it was when the professor taught himself in the class.

22. It's good to have lecture videos of the course given by the same instructor but classes must be held. As the difficult of the course has increased by now so I believe that there must be 2-3 discussion hours per week (and if possible try to schedule it in the evening or some other time but not at 8am). For a course like Probability and Statistics which is a very important course for all the departments clarity of the concepts is very important. Hence I feel that the lecture videos should be accompanied along with regular discussion hours(2-3 per week). Regular class has no substitute.

23. Think twice before applying it to other courses !

Process and Course Related Comments

1. It should be announced when the quiz/midsem/endsem papers be shown for future courses. Also video lectures should not be uploaded during the midsem and midsem break week, unlike this time.

2. Neeraj Sir is among the best prof. I have ever encountered.But I think that due to this flipped classroom method he does not care about content which is to be remembered in future.

3. The pace of teaching was not even. Until midsem only one chapter was covered from the book "Introduction to Mathematical Statistics" and it was quite easy for us because we already knew the basics from our JEE. But after midsem 3-4 chapters were covered from the same book and they were really hard to understand. If some part of multivariate random variables was done before midsem then it would have been really great. Perhaps the professor forgot that we had midsem recess in between and 90% of us dont really study during the recess.

4. I think blended format is better way to teach us because we are able to understand concepts very clearly by repeating the videos,but i think interaction between teacher and student is being weak by the time so i want the following changes: 1. Minor quizzes at every tutorials. 2. 2 hours tutorials per week. 3. Minor quiz should have question from tutorial problem. that's what i think Minor quizzes are better way to prepare ourselves and also it is good way to clear our concepts in effective way.At least for the sake of minor quizzes we will try to understand some of the concepts..

5. Solution to take home problem should be posted. Because sometimes it's hard to know whether my solution is correct or not.

6. You can keep 10 percent weightage for mini quizzes which are taken every week between videos so that it ensures that every student watches them regularly OR instead of giving them

11

10 percent weightage you can also give benefit to the student who watches regularly when grades are out if he is on the boundary case than you can upgrade his grade

7. If there were minor (or surprise) quizzes then it will make sure that we will attend class

8. Please make it compulsory for students to view the videos released in a particular week. The only problem faced is that of motivation as we know that the videos will always be available at any time and thus skip watching them regularly. If this regularity can be enforced then it can be one if the best systems ever devised.

9. With lectures being uploaded and no regular class, we end up watching all the lectures on the last day. Thus the understanding component goes away. This format could be made more effective if there is some way to enforce that we do not delay watching the lecture too much. Maybe there could be small online/offline quizzes regularly to ensure we complete the week's lectures. The good point is that I can watch the lecture at my own pace.

10. Yeah, there are a lot of things that can be done! For instance, making the videos shorter. Just like positive reinforcement having shorter videos of 8 minutes can provide a more gratification feeling than watching a 20 minutes video straight. It's like a burden. Unfortunately, the concept of online classes is screwed up here. The course should be conducted like it is done on Coursera. Otherwise what's the difference between NPTEL and this? Weekly assignments which are compulsory to submit will make the implementation of course easier.

11. Only thing that I disliked in this format is that I haven't feel any motivation behind regularly seeing all video lectures unlike regular lecture where I feel unsatisfied with myself if I am not able to understand concepts taught by instructor.

12. Plz don't upload videos during our vacations ; course is moving faster than expected.

13. Videos are very long and often repeating same concepts during explanation. These can be made about half of it's length as in current state they consume more time so I prefer downloading and reading the slides. Solved examples given in video/slides are very god and greatly help understanding various notations and other concepts. Thank You

14. Assignment discussion should also be made online.The instructor could upload the video solutions of the problems given in the assignment.

15. I think this flipped classroom format won't work in these mathematics courses which needs more hands-on practice at the time of understanding the concepts. So, indirectly if one student try to do practice while seeing videos it consumes more time than attending lectures and t is not

that efficient also.One can try this system in theoretical courses where there is less need for practice.

16. Making the video player more like Youtube like allowing shortcuts to fast forward and skip would really make it better . And >>Adding some online Assignments to be submitted. One point to keep us away from napping during video lectures is to add few simple questions between videos which is to be answered by student then only he can proceed in video further >This would serve us in a better way. Adding case studies related to This course would really make it more interesting I hope it helps

17. The main problem I faced during this course was a lack of discipline from the students. I feel that classrooms enforce that upon students. To overcome this situation, weekly assignments or quizzes should be evaluated so that students are forced to see the lecture videos on time. The forums are ineffective because there is no incentive to answer questions there. I feel that the site should be gamified to motivate students to get involved

18. One big disadvantage of the course is that it doesn't push a student in any manner till there is a quiz or a semester examination.Because of which students generally don't view the lectures regularly as done with the other subjects.So there should be atleast one factor which forces the student to study for every week.May be make the assignment submission compulsory or take mini quizzes every week.This could strongly increase the number of students actually viewing the lectures,coming to the doubt clearing sessions etc.

19. I think trial for flipped classroom is not to be tested on this type of course in which doubts should be cleared during lectures i.e interaction is required with instructor

20. Assignment should carry marks..this will ensure continue participation of individual

21. Course syllabus is too large post mid sem.

22. Too much content

23. correction needs to be liberal, even though the answer was correct marks were deducted just because presentation was not neat

24. The course content is too extensive should be limited a bit.

25. Course content is slightly greater towards the end of the course,instead it should have been evenly distributed.

26. I find topics covered in this course are a bit hard to grasp,more examples between topics could have helped.Thanks.

27. Very good professor. give some more practice problem in assignment

13

28. No coverage of Statistics. Probability and Statistics should be equally divided.

29. The pace after the mid semester was fast and also the length of the videos was exaggerated which made it difficult to understand the topics in a single go.

30. Assignment submission should be made compulsory for some regular question in the tutorial , and some tough ques should be discussed in tutorial.

31. I feel the need of more examples of the concepts.

32. More keyboard shortcuts can be added as a feature for the videos especially 5 sec forward as well as backward jump.

33. Site should be little bite fast

Platform Support

The course ran on mooKIT, a lightweight MOOC Management System conceived, designed and developed at IIT Kanpur.

Based on the discussion related to the platform, Several new features like, an advanced video player with many features from YouTube were introduced while running the course.
Few of them were

1. SPACE to Pause/Resume

2. Double-click to enter/exit full screen mode

3. Hide Controls in full-screen mode

4. Autofocus to the video on the lecture page, enabling to forward and rewind using left and right arrows

5. An option to send Feedback to instructors was introduced.

6. Upon the request the instructor can upload marks of the exams conducted offline to the platform, allowing the students to see their marks on their profile.

Committee Recommendations

The committee feels that the Blended/Flipped mode of teaching has definite merits and worked well in MSO201. Overall, it is noted that the benefits of a blended MOOC model outweigh some of its obvious limitations. The committee recommends that more courses be offered in this mode by interested instructors in the coming semester.

भारतीय प्रौद्योगिकी संस्थान, कानपुर
भारतीय प्रौद्योगिकी संस्थान, कानपुर

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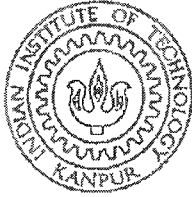
Indian Institute of Technology Kanpur:208016
Department of Computer Science & Engineering

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915

Dr. T.V.Prabhakar
Professor

21 July 2016

Chairman, Senate

Please examine

23.7.16

DOAA

Dear Sir,

. Kindly find enclosed the report on the MSO201 Flipped Class that was held in Year 2014-15, 2nd Semester by Prof Neeraj Mishra.

We are planning to run the following courses in the flipped mode in the next semester, 2015-16 1st semester. Kindly permit.

ME359 Internal Combustion Engines	Prof. Sameer Khandekar
ESO201A Thermodynamics	Prof. Jayant Singh
MSO202A Complex Variables	Prof. Sameer Chavan
MSO203B Partial Differential Equations	Prof. Kaushik Bal

MSO202 A and MSO203 B are half-a-semester courses.

To Chairman, Senate
The above four courses can be approved for the next semester. Report of the Committee may be referred to the Senate.
23-7-16

Thank you

T V Prabhakar

T.V.Prabhakar
on behalf of the Flipped Class Monitoring Committee (Prof Ajit Chaturvedi, DOAA, Chairman SUGC, Prof Satyaki Roy)

Senate Desk.

25/7/16

Agreed and approved
In dream of
23.7.16

Telephone: (91) (512) 2597618, 2597638 (office) 2598556 (residence)
Fax: (91) (512) 2590725   E-mail: tvp@iitk.ac.in

For n/a please
23.7.16
Secretary, Senate