# सीनेट की पन्द्रहवीं बैठक का कार्यवृत्त MINUTES OF THE $15^{TH}$ MEETING OF THE SENATE

30<sup>TH</sup> MARCH 2006



भारतीय प्रौद्योगिकी संस्थान रूड़की रूड़की - २४७ ६६७ (भारत) INDIAN INSTITUTE OF TECHNOLOGY ROORKEE ROORKEE – 247 667 (INDIA)



Lt Col A K Srivastava (Retd) Registrar

#### भारतीय प्रौद्योगिकी संस्थान रुड़की

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No.IITR/MS/15<sup>th</sup> Senate (3/2006)/696 Dated: 10<sup>th</sup> April 2006

#### All Members of the Senate Indian Institute of Technology Roorkee

Subject: Minutes of the 15<sup>th</sup> Meeting of the Senate held on 30<sup>th</sup> March 2006 in the Senate Hall of the Institute.

Sir,

Enclosed herewith please find a copy of the Minutes of the 15<sup>th</sup> meeting of the Senate of this Institute held on 30<sup>th</sup> March 2006 at 11.00 A.M. in the Senate Hall, for your perusal. Your comments, if any, on the minutes may please be sent within 15 days.

Yours faithfully,

( A. K. Srivastava ) Lt. Col. (Retd.) Registrar

Encl: As above

### INDIAN INSTITUTE OF TECHNOLOGY, ROORKEE ROORKEE-247 667 (INDIA)



### Minutes of the 15<sup>th</sup> Meeting of the Senate held on 30<sup>th</sup> March 2006 at 11.00 A.M. in the Senate Hall of the Institute.

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## Minutes of the 15<sup>th</sup> Meeting of the Senate held on 30<sup>th</sup> March 2006 at 11.00 A.M. in the Senate Hall of the Institute.

The following were present: -

1.	Prof. Prem Vrat, Director	- Chairman
2.	Prof. R. Shankar	(Architecture & Planning)
3.	Prof. G.S. Randhawa	(Biotechnology)
4.	Prof. B.M.J. Periera	(Biotechnology)
5.	Prof. H.S. Dhaliwal	(Biotechnology)
<u>6</u> .	Prof. R.P. Singh	(Biotechnology)
7.	Prof. I.M. Mishra	(Chemical Engineering)
8.	Prof. Bikash Mohanty	(Chemical Engineering)
9.	Prof. Shri Chand	(Chemical Engineering)
10.	Prof. I.D. Mall	(Chemical Engineering)
11.	Prof. A.K. Jain	(Chemistry)
12.	Prof. G. Bhattacharya	(Chemistry)
13.	Prof. R.N. Goyal	(Chemistry)
14.	Prof. Ravi Bhushan	(Chemistry)
15.	Prof. V.K. Gupta	(Chemistry)
16.	Prof. (Mrs) Mala Nath	(Chemistry)
17.	Prof. A.K. Singh	(Chemistry)
18.	Prof. S.M. Sondhi	(Chemistry)
19.	Prof. G. Ramaswamy	(Civil Engineering)
20.	Prof. A.K. Jain	(Civil Engineering)
21.	Prof. K.K. Singh	(Civil Engineering)
22.	Prof. S.S. Jain	(Civil Engineering)
23.	Prof. M.N. Viladkar	(Civil Engineering)
24.	Prof. Deepak Kashyap	(Civil Engineering)
25.	Prof. (Mrs) Renu Bhargava	(Civil Engineering)
26.	Prof. U.C. Kothyari	(Civil Engineering)
27.	Prof. P.K. Garg	(Civil Engineering)
28.	Prof. Ashwani Kumar	(Earthquake Engineering)
29.	Prof. H. R. Wason	(Earthquake Engineering)
30.	Prof. H. Sinvhal	(Earth Sciences)
31.	Prof. V.N. Singh	(Earth Sciences)
32.	Prof. A.K. Awasthi	(Earth Sciences)
33.	Prof. R.G.S. Sastry	(Earth Sciences)
34.	Prof. A.K. Sarat	(Earth Sciences)
35.	Prof. R.N. Mishra	(Electrical Engineering)
36.	Prof. H.O. Gupta	(Electrical Engineering)
37.	Prot. Pramod Agarwal	(Electrical Engineering)
38.	Prof. S. Mukherjee	(Electrical Engineering)
39.	Prof. D.K. Mehra	(Electronics & Computer Engg.)
40.	Prof. R.C. Joshi	(Electronics & Computer Engg.)
41.	Prof. S.N. Sinha	(Electronics & Computer Engg.)

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42.	Prof. Ranvir Singh	(Hydrology)
43.	Prof. N.K. Goel	(Hydrology)
44.	Prof. (Ms) Asha Kapoor	(Humanities & Social Sciences)
45.	Prof. (Ms) Renu Rastogi	(Humanities & Social Sciences)
46.	Prof. A.K. Singh	(Paper Technology)
47.	Prof. J.S. Upadhyay	(Paper Technology)
48.	Prof. Satish Kumar	(Paper Technology)
49.	Prof. V.K. Nangia	(Management Studies)
50.	Prof. G. S. Srivastava	(Mathematics)
51.	Prof. (Mrs.) R.R. Bhargava	(Mathematics)
52.	Prof. S.P. Sharma	(Mathematics)
53.	Prof. T.R. Gulati	(Mathematics)
54.	Prof. R.C. Mittal	(Mathematics)
55.	Prof. V.K. Katiyar	(Mathematics)
56.	Prof. Roshan Lal	(Mathematics)
57.	Prof. Sunita Gakkhar	(Mathematics)
58.	Prof. V.K. Goel	(Mechanical & Industrial Engg.)
59.	Prof. Satish C. Sharma	(Mechanical & Industrial Engg.)
60.	Prof. Dinesh Kumar	(Mechanical & Industrial Engg.)
61.	Prof. P.K. Jain	(Mechanical & Industrial Engg.)
62.	Prof. P.S. Mishra	(Metallurgical & Material Engg.)
63.	Prof. S. Ray	(Metallurgical & Material Engg.)
64.	Prof. P.K. Ghosh	(Metallurgical & Material Engg.)
65.	Prof. Ishwar Singh	(Physics)
66.	Prof. Jagdish Rai	(Physics)
67.	Prof. G.S. Singh	(Physics)
68.	Prof. Gopal Chauhan	(WRDM)
69.	Prof. S.K. Tripathi	(WRDM)
70.	Prof. Ashwani K. Chaudhary	(Institute Instrumentation Centre)
71.	Prof. Karmeshu	Prof. & Dean, JNU, New Delhi
72.	Mr. Arun Kumar	Head, AHEC
73.	Mr. R.K. Jain,	Associate Dean of Students Welfare
74.	Mr. Yogendra Singh	Librarian
75.	Dr. R.P. Saini	Chief Warden, Cautley Bhawan
76.	Dr. R.P. Maheshwari	(Electrical Engineering)
77.	Dr. Rashmi Gaur	(Humanities & Social Sciences)
78.	Dr. M.R. Maurya	(Chemistry)
79.	Dr. Ajay Gairola	(Civil Engineering)
80.	Lt. Col. (Retd) A.K.Srivastava,	Registrar - Secretary

The Chairman welcomed the members to the  $15^{\text{th}}$  Meeting of the Senate.

Before taking up the agenda items, the Senate thanked the undermentioned outgoing members and recorded its appreciation for their valuable contribution in the meetings of the Senate.

- 1. Prof. H.C. Mehndiratta, Civil Engineering
- 2. Prof. M. Bhattacharya, Mech. & Indl. Engineering
- 3. Dr. Praveen Kumar, Associate Professor, Civil Engineering
- 6. Dr. A.K. Saraf, Associate Professor, Earth Sciences
- 5. Dr. S.P. Srivastava, Associate Professor, Electrical Engineering
- 7. Dr. (Ms.) Sunita Gakkhar, Associate Professor, Mathematics
- 4. Dr. B.K. Mishra, Associate Professor, Mechanical & Industrial Engg.
- 8. Dr. Anjan Sil, Associate Professor, Metallurgical & Material Engg.

The Senate also welcomed the under- mentioned new members and hoped for their valuable contribution and active participation in its functioning:

- 1. Prof. R.P. Singh, Biotechnology
- 2. Prof. I.D. Mall, Chemical Engineering
- 3. Prof. S.M. Sondhi, Chemistry
- 4. Prof. R.G.S. Sastri, Earth Sciences
- 5. Prof. R. Anabalagan, Earth Sciences
- 6. Prof. A.K. Saraf, Earth Sciences
- 7. Prof. Y.K. Gupta, Mathematics
- 8. Prof. Sunita Gakhar, Mathematics
- 9. Dr. M.R. Maurya, Associate Professor, Chemistry
- 10. Dr. Manoj Arora, Associate Professor, Civil Engineering
- 11. Dr. Ajay Gairola, Associate Professor, Civil Engineering
- 12. Dr. R.P. Maheshwari, Associate Professor, Electrical Engineering
- 13. Dr. Manoj Mishra, Associate Professor, Electronics & Computer Engg.
- 14. Dr. Rashmi Gaur, Associate Professor, Humanities & Social Sc.
- 15. Dr. R.P. Saini, Chief Warden, Cautley Bhawan

The Senate recorded the apologies received from the following members for not attending the meeting:

- 1. Prof. N.K. Gupta, IIT Delhi.
- 2. Prof. Devi Singh, Director, IIM, Lucknow
- 3. Prof. A.K. Ray, Head, Department of Paper Technology
- 4. Prof. Pashupati Jha, Department of Humanities & Social Sciences
- 5. Prof. Rama Bhargava, Department of Mathematics
- 6. Prof. D.K. Paul, Head, Department of Earthquake Engineering
- 7. Dr. Manoj Arora, Associate Professor, Department of Civil Engg.

At the outset, the Chairman (Director) stated the house that Prof. D.K. Mehra, Department of Electronics & Computer Engineering, and Prof. H. Sinvhal, Department of Earth Sciences have been nominated on the Board of Governors of the Institute as Senate nominees.

The Director also thanked to Prof. H.K. Verma, Department of Electrical Engineering and Prof. A.K. Jain, Department of Chemistry, outgoing members of the Board of Governors (as Senate nominees) and recorded its appreciation for their valuable contribution in the meetings of the Board of Governors.

The agenda was then taken up.

### Item No.15.1.1 To confirm the minutes of the 14<sup>th</sup> Meeting of the Senate held on 5<sup>th</sup> December 2005.

The Senate confirmed the minutes of the 14<sup>th</sup> Meeting of the Senate held on 5<sup>th</sup> December 2005 with the under-mentioned observations:

The name of Prof. H. Sinvhal at Sl. No.3 of the page No.3 of the minutes, under the list of members whose apologies were received for not attending the meeting, be deleted.

### 14.2.13 To consider the format of Transcript to be used by the Institute.

The Senate decided that the para No.4 of the said minutes be read as under:-

4. The transcript be sent to the students within 02 **working** days after receipt of the fee from the students.

Further, the under-mentioned two para No.6 & 7 may also be added to the said minute:-

- 6. The Institute should advertise the procedure for issuance of transcripts on its website.
- 7. The Institute should try to make arrangements so that the required fee can be deposited by money transfer through bank by credit card or other electronic means.

#### Item No. 15.1.2 To receive a report on the actions taken to implement the decisions taken by the Senate in its 14<sup>th</sup> Meeting held on 5<sup>th</sup> December 2005.

The Senate noted that the actions have been taken on the decisions taken by the Senate in its 14<sup>th</sup> Meeting held on 5<sup>th</sup> December 2005.

#### **ITEMS FOR CONSIDERATION:**

#### Item No. 15.2.1 To consider the issue for inducting Chairman, JEE & Chairman, GATE on the ECS as Ex-Officio Members.

After discussion, the Senate decided that the Chairmen, JEE and GATE of the Institute be made an Ex-Officio member of the ECS.

Further decided that the functions of the ECS be reviewed and a separate proposal for inducting other members on the ECS be placed before the Senate for consideration.

### Item No.15.2.2 To consider the subject registration of the student having back papers.

After discussion, the Senate decided that the students should first select the back papers and then the remaining papers to make up 28 credits/ semester. The backlog papers may be in the 8 O'clock slot and there be more time/slots for back papers. Academic Deans to take up the same to facilitate this process.

#### Item No.15.2.3 To consider the interchange in teaching scheme of B.Tech. (Electrical Engineering) IV year.

After discussion, the Senate decided that the recommendations of the BUGS for interchange the "Departmental Elective-III of B.Tech. IV year (Spring Semester) with Institute Elective-III of B.Tech. IV year (Autumn Semester)" as given at **Appendix 'A'** be approved from the session 2006-07. This will also evenly distribute departmental electives.

#### Item No.15.2.4 To consider the letter No. EED/362/GEE dated 23.12.2005 from Prof. & Head, Department of Electrical Engineering regarding to award the scholarship

As considered and recommended by the Board, UGS, the Senate decided that those students, who have been punished for unfair-means during MTE / ETE or a severe disciplinary action, be not awarded Merit-cum-Means Scholarship and other trust scholarship for entire remaining period of programme. However, for Medals, Prizes and awards, the student shall not be considered for such Medals, Prizes and awards for that session only.

# Item No.15.2.5 To consider the number of seats available and offers of admission to be made in the B.Arch. programme.

As considered and recommended by the Board, UGS, the Senate decided that during the session 2006-07, 10% more offers of admissions in B.Arch. Programme be made over and above the sanctioned strength, so that the numbers of seats in these courses do not remain vacant if some candidates withdraw. The revised distribution of seats will be as under:

Name of Branch	General	SC	ST	PD	Total
B.Arch.	43	08	04	02	55+2

#### Item No. 15.2.6 To introduce a new Institute Elective course ICE-01: Geographic Information System.

As considered and recommended by the Board, UGS, the Senate decided that the introduction of a new Institute Elective course ICE-01: Geographic Information Systems as given at **Appendix 'B'**, be approved for both the semesters.



### Item No. 15.2.7 To consider the revision of syllabus of B.Tech. Ist year "CY-101: Chemistry" core course.

As considered and recommended by the Board, UGS, the Senate decided that the syllabus of B.Tech. 1<sup>st</sup> year "CY-101: Chemistry" as given at **Appendix 'C'**, be approved subject to distribution of breakup of marks as per norms of the Senate.

#### Item No. 15.2.8 To consider the revised syllabi for Master of Technology Geotechnical Engg. and Geotechnical Engg. with diversification in Rock Mechanics.

As considered and recommended by the Board, PGS&R, the Senate decided that the revised syllabi for Master of Technology in Geotechnical Engineering, and Geotechnical Engineering with diversification in Rock Mechanics, as given at **Appendix 'D'** be approved in principle. The department be requested to modify indicative contact hours of various courses to a maximum of 42. The number of suggested books should also be increased. The Senate authorised the Chairman, Senate to approve the modified courses and teaching scheme for these courses.

#### Item No. 15.2.9

#### 9 To consider the recommendations of the BPGS&R to modify the clause No.R-2 (3-e) and withdraw the clause R.2 (4) of Ph.D Ordinance and Regulation.

As considered and recommended by the Board, PGS&R, the Senate decided that the clause No. R-2(3e) of Ph.D Ordinance and Regulation be modified is as under:

R-2 (3-e) The facility of part- time registration will be available only to candidates working in organizations having R&D Sections and public sector undertakings recognized by IITR and/ or having MOU with IITR. The applicants must have been in continuous service with the sponsoring organization for at least **two years** at the time of submitting the application form for admission.

The Senate further decided that the Clause R.2 (4) of Ph.D. Ordinance and Regulation be withdrawn. In case, the sponsorship is withdrawn, the candidate can continue his Ph.D., provided he/she has passed the comprehensive examination.

### Item No. 15.2.10 To consider the fee to be charged by the Institute for obtaining transcripts.

As considered and recommended by the BUGS, the Senate decided that from the session 2004-05 onwards, the under-mentioned fee be charged from all the students/ graduates for obtaining the transcripts:

- For students /graduates requesting Rs. 1000/for 10 copies and (or) part thereof at one address specified by the applicant in India, or collected personally in sealed & signed envelope.
- (2) For students/graduates requesting US\$ 100 or for 10 copies and (or) part thereof at one address abroad.
   US\$ 100 or equivalent in Indian Rupees
- (3) Additional charges for sending Transcripts at more than one address:

(a) In India	Rs. 50 per address
(b) Abroad	US\$ 20 per address or
	equivalent in Indian Rupees

- (4) The charges be reviewed after two years.
- (5) The Transcripts be sent to the students latest within five working days after receipt of the fee from the students.
- (6) The words "Officer on Special Duty / Assistant Registrar be replaced by "Authorized Signatory".
- (7) The same be displayed on the Institute Website.
- (8) Electronic fund transfer facility, payment through credit card, with the commission etc. to be charged to the sender, be explored with the SBI, IIT Roorkee.

#### Item No. 15.2.11 To consider the Academic Calendar for the Autumn Semester of the session 2006-2007 (June 20, 2006 to January 02, 2007).

After discussion, the Senate decided that the Academic Calendar for the Autumn Semester of the session 2006-2007 (June 20, 2006 to January 02, 2007) as given at **Appendix 'E'**, be approved.

#### Item No. 15.2.12 To consider the change of branch for 5 years Integrated M.Sc. /M.Tech. / IDD Programmes to B.Tech. /IDD or M.Sc. / M.Tech. Programmes.

As considered and recommended by the Board UGS, the Senate decided that the amendments to the regulations 13(1)-13(5), to include IDD and 5-year Integrated M.Sc./M.Tech. (Sciences) programmes also for the branch change be approved as under:

- 13 (1) The allotment of branch/programme to a student shall be made at the time of counselling by JEE on the basis of merit according to the preference of the student and the availability of seats.
  - (2) A student enrolled for B.Tech./IDD/five year integrated M.Sc./M.Tech (sciences) programmes through Joint Entrance Examination carried out by JEE, shall be eligible for change of branch/programme at the end of first year provided that he/she satisfies the following criteria:
    - (i) CGPA for general category  $\geq 7.5$
    - (ii) CGPA for SC/ST category students  $\geq 6.5$
    - (iii) Earned credits at the end of first year  $\geq 50^*$

\*The credits for NCC/NSS/NSO/Rangering, Proficiency and discipline shall not be counted for this purpose.

(3) While making the change of branch/ programme of a student the strength of a class should not fall below the existing strength by more than 10% and should not exceed the sanctioned strength by more than 5%. For this

purpose the strength refers to the total strength of the students in the class of a given branch/programme excluding the direct admissions and failures:

Provided that a student of general category shall not be allowed the change of branch/ programme against the vacant seats of SC/ST category.

- (4) A student who has secured a rank within the top 1% and satisfies the criteria for eligibility of change of branch/programme, shall be allowed change of branch/programme to his/her choice without any constraint if he/she applies for it. The remaining eligible applicants shall be allowed change of branch/programmes strictly on the basis of inter-se-merit as reflected in their CGPA. In case the CGPA of more than one student seeking the change of branch/programme is the same, their inter-semerit shall be decided on the basis of their ranks in JEE.
- (5) If a student of higher CGPA is not offered a particular branch/progamme because of other constraints, this will not be offered to any other student with a lower CGPA even if he/she is eligible for change of branch/programmes on the basis of regulations in sections 13(2) to (4).

The above regulations shall be applicable from the session 2006-07 for the students in I year.

The Senate further decided that the first year course will be common to all the B.Tech./IDD/five year Integrated M.Sc./ M.Tech. (Sciences) programmes, to which entry is through the JEE.

### Item No. 15.2.13 To consider the proposal of DPT Saharanpur to increase the intake of B.Tech. (P&P) course.

As considered and recommended by the Board UGS, the Senate decided that the proposal of DPT Saharanpur Campus for increasing the intake of

students for B.Tech. (Pulp & Paper) programme from 51 to 70 be approved as under.

Name of Branch	General	SC	ST	PD	Total
B.Tech. (P&P)	54	11	05	02	70+2

#### Item No. 15.2.14 To consider the Guidelines for the "Self Study Course "under the special nature courses.

As considered and recommended by the Board UGS, the Senate decided that the existing regulation 6.8 for the "Self Study Course" be approved with minor addition highlighted below:-

"One self study course may be offered under special circumstances from the list of regular courses of study, to a student in his/her final semester or thereafter when he/she is likely to fall short by a maximum of 6 earned credits to become eligible for the degree. A student shall be awarded a maximum of "B" grade in the course. This course shall be offered only if approved by the Dean, UGS on the recommendation of the chairman, DUGC with the provision that the valuation process will not be diluted."

#### Item No. 15.2.15 To introduce a new Institute Elective course IHS-74: Entrepreneurship Development: Strategies

As considered and recommended by the Board UGS, the Senate decided that the proposal of Department of Humanities & Social Sciences to introduce a new Institute Elective course "HIS-74: Entrepreneurship Development: Strategies" and the syllabus as given at **Appendix 'F'** be approved for both the UG & PG students.

#### Item No. 15.2.16 To consider the relative weightage for undergraduate/ IDD/Integrated M.Sc. & M.Tech. courses

As considered and recommended by the Board UGS, the Senate decided that the under-mentioned relative weightage assessment for CWS, MTE, PRS and

ETE for all the courses across all the Departments/ Centres be approved:

Lectures, Tutorials and Lab work without Practical exam.

Lectures, Tutorial without Lab work

(a) CWS – 15 CWS - 25(b) PRS - 15 MTE - 25 (c) MTE - 30 ETE - 50 (d) ETE - 40

The End Term Examination shall be of 03 hrs. duration for the courses having 3 hours lectures/ week.

The Senate further decided that the above relative weightage be considered for all UG/IDD/ Integrated M.Sc. & M.Tech. programmes with the modification that the weightage for courses not covered by the above subject categories will be at the discretion of concerned Head of the Department/ Centre.

#### Item No. 15.2.17 To consider the course structure and syllabi for five years Integrated M.Sc./ M.Tech. Programmes.

As considered and recommended by the Board UGS, the Senate decided that the course structure and syllabi for five years Integrated M.Sc./ M.Tech. Programme be approved as under:

- The first year course of the five year Integrated 1. M.Sc./ M.Tech. (Sciences) courses to which entry is through the JEE will be common with that of B.Tech. Ist year/IDD Ist year programmes.
- The course of 2 credits on IT Skills' in the third 2. be replaced by a 4 credit course in semester Chemistry.
- 3. The scheme of teaching and examination for the M.Sc./M.Tech. (Sciences) programmes for second year be approved as per Appendix 'G'.

The Senate further decided that the additional students in B.Tech. and M.Tech.(Polymer Sciences & Technology) be admitted at DPT, Saharanpur Campus this year for the session (2006-07) through JEE and the remaining five year M.Sc./M.Tech. programmes will start from the next year (2007-2008), subject to availability of adequate hostel facilities.

#### Item No. 15.2.18 To consider the inclusion of Mother's name in all Certificates and documents as per MHRD letter F.No.12-6/2006-T.S.-1 dated 7<sup>th</sup> February 2006.

As considered and recommended by the Board UGS, the Senate decided that the name of the mother of the candidates be included in all such documents, where the name of father is mentioned. In future, the Institute application form for entry to various courses will be modified to facilitate this process. This be implemented prospectively.

# Item No. 15.3.1 To report that the Director has approved the academic awards and other prizes to the students for the year 2005.

The Senate noted that the Director has approved the academic awards and other prizes to the students for the year 2005. The prizes/ awards to the students were given in the Science Day function for the year 2005 held on 6<sup>th</sup> February 2006 **(Appendix 'H').** 

#### **UNDER ANY OTHER ITEMS:**

#### Item No. 15.2.19 To consider the issue for the faculty selections.

The Director (Chairman) stated to the house about the letter received from the Chairman, Board of Governors regarding faculty selection. After discussion, the Senate decided that a letter be sent to the Chairman, BOG stating that there is no such convention in the any Institute or provision in the Statutes, which places any restriction on the Director on holding faculty/ other selections, hence the Director may hold faculty/ other selections during his entire tenure.

The meeting ended with a vote of thanks to the Chair.

### **Curricular Structure**

	<u></u>	Teaching Scheme			Но	Conta urs/V	ict Veek	Ex Dur (H	am. ation rs.)	Re	lative	e Wei	ghlag	e (%
S.No.	Subject Code	COURSE TITLE	Subject Area	Credits	L	Т	Р	Theory	Practical	CWS	PRS	MTE	ETE	PRE
AUT	UMN SEME	STER (7th Semester)												
1	EE-401	Electrical Drives	DC	5	З	1	2	3	-	15	15	30	40	] -
2	EE-403	Control Systems	DC	5	3	1	2	3	3	15	.15	15	40	15
3	EE-405	Protection & Switchgear	DC	5	3	1	2	3	3	15	15	15	40	15
4		Departmental Elective-II	DE	4	3	1	0	3	•	25	•	25	50	•
5		Institute Elective-III	IE	4	3	1	0	3	-	25	•	25	50	-
6	EE-407	Practical Training Viva	DC	2		2	-	•	·	100	•	1.	· ·	-
7		Project*	DC	<b>-</b> `.	3		•	•	-	•	· ·	· ·	•	
SPRI	NG SEMES	TER (8th Semester)							_		_			
1		Departmental Elective-II	DE	4	3	1	0	3	•	25	•	25	50	
2		Departmental Elective-IV	DE	4	3	1	n	3	·	25	•	25	50	-
3		Departmental Elective-V	DE	4	3		0	3		25.	-	25	50	- ·
4		Project*	DC	12		•	16	- ·	- 1			50	50	

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[]	LE-4111:	Teating and Commissioning of Electrical Equipments
2	EE-412	Utilization and Traction
3	EE-413	CAD of Electrical Power Apparatus
4	EE-414	EHV AC and DC Transmission
5	EE-415	Switch Gear
6	EE-416	Elements of Power System Reliability
7	EE-417	Advanced Power Electronics
8	EE-418	Power Quality Improvement Techniques
9	EE-419	Design of Electric Drives

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10	EE-421	Data Structures
11	EE-422	Digital Signal Processing
12	EE-422	Introduction to Antificial Neural Networks
13	EE-424	Introduction, of Robotics
14	EE-425	Programming Techniques for On-line Computer Applications
15	EĘ-427	Substation Automation
16	EE-429	Digital Image Processing
17	ÉE-430	Single Chip Microcomputers and Applications

Appendix-B Item 15.2.6

#### **INDIAN INSTITUTE OF TECHNOLOGY ROORKEE**

#### NAME OF DEPT/CENTRE

Subject Code: ICE-01

1.

#### CIVIL ENGINEERING DEPARTMENT

#### Course Title: Geographic Information Systems



<sup>7.</sup> Pre-requisite : NIL

8. Subject Area: Multidisciplinary, to be coordinated initially by the Civil Engg. Deptt.

- 9. Objective of the Course: The objective of the course is to provide basic knowledge of GIS theory and engineering applications using the existing state-of-the-art GIS software. The course shall be taught using a combination of lectures, demonstrations, and hands-on, interactive practicals in the classroom, with the assistance of faculty drawn from various departments in both the semesters. Faculty can be drawn by the coordinating department in collaboration with the other departments.
- 10. Details of Course:

SL No.	Particulars	Contact Hours
1	GIS and the Information Age: Introduction., Information and Change, Why GIS? What is GIS? GIS Principles	2
2	What Does GIS Do?: Introduction, Preview of GIS Functions, Modeling. The Nature of GIS	2
3	Spatial Data: Introduction, Spatial Data and its Analysis, The GIS Database, Attributes, Data Manipulation Options, The GIS Relational Database, The Database Approach, Tools from Spatial Statistics.	6
4	Raster and Vector Data: Introduction, Descriptions: Raster and Vector data. Raster Versus Vector. Raster to Vector	2
5	Topology: Introduction, Topology and Spatial Relationships, Intelligent Structure, Database Links, Topology and Relational Query, Multiple Connectivity, Topology's Advantages	4
6	Data Entry: Introduction, GIS Data Acquisition, Remote Sensing, General Reference to Thematic Data, Manual Digitizing, Editing Digitized Data: Problems, Automatic Digitizing, Georeferencing., Digitized File Conversion, Database Construction, GIS and the GPS. Data Output	5
7	Inventory Operations: Introduction, List Operations, Database Capabilities, Linking, Graphic Selection Query, Boolean Queries, Measurement, Statistical Reports, Recode	4
8	Basic Analysis: Introduction, Database Recode, Overlay, Map Algebra and Overlay. Overlay Codes: Planned Results, Overlay Using Weights, Matrix: Add, Matrix Recode Overlay, Vector Overlay, Overlay Options, Clip and Mask, Scalar Image, Mosaic with Rotate, Analysis Method, Buffers, Spatial Analysis, Statistical Reporting and Graphing	5
9	Advanced Analysis: Introduction. Proximity Analysis, Graphics Operations. Terrain Analysis. Network Operations,	4
10	Site Suitability and Models: Introduction, Overlay, Models, Application Planning, Site Suitability and Models Recap	3
11	Data Issues and Problems: Introduction. Raster Problems. Second-generation Data. Scale. Edge Matching, Area and Scale Coverage, Data Problems. Data Issue	2
12.	Case Studies, Various Engineering Applications.	3

11.	Suggested Books	
SI. No.	Name of Books/Authors	Year of Publication
1	Exploring geographic information systems, . Nicholas R. Chrisman	2002
2	Geographic information systems and science, Paul A. Longley	2001
3	Fundamentals of Geographic Information System, Second Edition, Michael N. Demers	2000

Chemistry

	CY-101, B.Tech. 1 <sup>st</sup> Yr. Common Course Cf. BUGS (Item 25.2.4 dated 20.10.06) <u>Revised: DFB-20 Jan 2006</u>
Subject : CY-101 Cour	se Title: B.Tech. 1 <sup>st</sup> Year Common Course
Contact Hours : L-3; T-1;	P-2
Examination Duration (Hrs)	Theory 03 Practical 0 2
Relative weightage: CWS .15	PRS 10 MTE 25 ETE 35 PRE 15
Credits: 05 6. Sem	nester Yes

Autumn

Spring

Both

7. Pre-requisite:

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5.

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8. Subject Area :

Objective of Course : r To provide a theoretical and experimental knowledge of reaction mechanisms and to make the scientific background stronger for engineering discipline students.

NII

Chemistry

10. Details of Course:

S. No.	Particulars	Contact Hours
1	Thermodynamics: Entropy, Free energy, Partial Molar quantities, Chemical potential, Gibb's-Duhem equation and their applications to physical and chemical equilibria	6
2	<i>Kinetics and Catalysis:</i> Theories of chemical reactions, Adsorption- Langmuir adsorption isotherm, Surface activity – Gibb's adsorption isotherm, Homogeneous and Heterogeneous catalysis – Enzyme catalysed reactions, Langmuir-Hinshelwood mechanism	6
3	Electrocheme al cells: Electrochemical corrosion and fuel cells, battery .	2
4	Stereoisomerism: Configuration, Fischer projections, R,S nomenclature, geometrical isomerism in compounds containing two C=C double bonds (E&Z), and simple cyclic systems. Elementary idea of conformation, Newman projection (ethane & substituted ethane). Optical isomerism of compounds without asymmetric carbon atom (allenes, spiro compounds, etc.), chirality involving atoms other than carbon	5
5	<ul> <li>Reaction Mechanism and Stereochemistry in Organic Synthesis:</li> <li>(a) Carbocations, carboanion and free radicals: their generation and stability</li> <li>(b) Addition of Br<sub>2</sub>, KMnO<sub>4</sub>, OsO<sub>4</sub>, on cis-, and trans-2-butene</li> <li>(c) Diels-Alder reaction: (4+2) cycloaddition MO treatment</li> </ul>	3
	<ul> <li>(d) Aromatic nucleophilic substitution mechanism (SNAr, SN1, Arynes) reactivity and reactions</li> </ul>	2
	(e) Novel Polymers: Stereo chemical control of synthesis, Ziegler-Natta catalyst, Polyurethanes, conducting polymers	2
	. Mr	Ρ.Τ.Ο

6	Introduction to NMR and MS	2
7	Coordination compounds: Crystal field theory of octahedral and tetrahedral complexes, colour and magnetic properties, John-Teller distortion with specific reference to d <sup>9</sup> case.	4
8	Organometallics (i) Metal carbonyls: synthesis, structure and bonding (ii) Metal alkene complexes: Bonding in Metal alkene complexes, role of metal alkene complexes in hydrogenation and hydro-formylation	4
9	Instrumental Techniques: UV-visible, and IR: Elementary idea and application to simple compounds/coordination complexes	4
10	Metal ions in biological systems Role of trace metals in biological systems with special reference to transition metals (Cu, Fe, Co), toxic effect of Cd and Hg.	2
	<ol> <li>Practicals*         <ol> <li>Determination iron in iron ore using potassium dichromate (Internal indicator method)</li> <li>Determination of sodium carbonate in baking/ washing soda</li> <li>Determination of hardness of water by EDTA-complexometry titrations</li> <li>Heat of neutralization of a strong base by a strong acid</li> <li>Equivalent weight of an acid</li> <li>Viscosity of mixtures of liquids</li> <li>Surface excess of 1-butanol in aqueous solution</li> <li>Order of reaction</li> <li>Percentage of ammonia in an ammonium salt</li> <li>Identification of functional groups in organic compounds</li> </ol> </li> <li>Blue Printing</li> <li>pH metry/ potentiometry titrations         <ol> <li>Strong acid – strong base;</li> <li>Determination of acetanilide or Aspirin, by microwave irradiation</li> <li>Preparation of acetanilide or Aspiri</li></ol></li></ol>	

#### Suggested books:

 Lee (JD). Concise Inorganic Chemistry. 2002. Fifth Edn., Chapman & Hall.
 Malik (T), Madan. Selected topics in inorganic chemistry. 2003. 5<sup>th</sup> Ed., S. Chand & Company.

- 3. Peter Sykes. A guide book to mechanism in organic chemistry. 2002. 6th Ed., Orient Longman.

Morrison (RT), Boyd (RN). Organic Chemistry. 2001. Sixth Ed., Printice Hall of India.
 Mahan (BH). University Chemistry. 1980. 3<sup>rd</sup> Ed., Narosa Publishing House, New Delhi.
 Atkins (PW). Physical Chemistry. 1994. Vth Ed., ELBS, Oxford Univ. Press, Oxford.

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#### INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPTT/CENTRE	:	CIVIL ENGINEERING	

1.	Subjec	ct Code: CE 530 Course Title: Plasticity and Fracture Mechanics in Rock Strue	ctures	
2.	Conta	ct Hours : L - 3; T - 1; P - 0		
3.	Exami	nation Duration (Hrs.) : Theory 0 3 Practical		
4.	Relativ	ve Weightage : CWS 2 5 PRS 0 0 MTE 2 5 ETE 5 0 PR	E	
5.	Credite	Credits : 0 4 6. Semester : Autumn Spring Both $$		
7.	Pre-re	quisite : CE-532 Engineering Behaviour of Rocks		
8.	Subjec	t Area : Geotechnical Engineering		
9. 10.	Object theory and ro Details	ive of Course : The objective of the course is to provide knowledge of (i) fundan of plasticity as applied to problems of various structures excavated in or founded ck masses and (ii) fracture mechanics with special reference to rock structures.	nentals of on rocks	
	S. No.	Particulars	Contact Hours	
	1.	Three dimensional stress analysis, stress invariants, octahedral stresses and generalized stresses	03	
	2.	Large deformations, finite strains – Euler and Lagrangian approaches, Green's and Cauchy's strain trensor, Lagrangian and Almansi finite strain tensors	04	
	3.	Yield criteria : Von Mises, Tresca, Mohr-Coulomb, Drucker-Prager, Modified Mohr-Coulomb, Hoek & Brown yield criteria	05	
	4.	Isotropic and kinematic hardening, softening normality principle, plastic flow rule, plastic potential, Drucker's postulates and Prandtl's conditions for stability of plastically deforming bodies	04	
	5.	Plastic Stress Strain Relations : Stress path dependent behaviour, Prandtl- Rauss equations, Levy-Mises relations, generalized elasto-plastic stress-strain relations, hardening modulus, Applications to problems of tunnels etc.	05	
	6.	Crack phenomenon and mechanics of brittle fracture propagation, strain energy associated with crack propagation, effect of cracks on elastic properties	04	
	7.	Energy theories of failure, elementary theories of crack propagation, propagation of cracks in elasto-plastic media, Constitutive equations for rocks – Class-I and Class-II materials, Servo controlled testing and post failure behaviour of rocks under uniaxial and tri-axial stress conditions in tension. Compression and shear, size effect, representative size of specimen.	08	
	8.	Continuum, characterization of jointed rock mass, Weibull's theory in tension, compression and bending for strength, constitutive equations for discontinuities – Joint stiffnesses and shear strength, Ladanyi's constitutive equations, Stick-Slip phenomenon	05	
	9.	Application of fracture mechanics to underground openings, rock slabbing, rock bursting and hydraulic fracturing	04	
		TOTAL	42	

11. 12. Laboratory Practicals : Nil Suggested Books :

S. No.	Name of Books / Authors	Year of Publication
1.	Fracture Mechanics of Engineering Structures and Rocks / Orekhov, B.G. and Zertsalov, M.G.	2001
2.	Comprehensive Rock Engineering Vol. 1 to 5	1993
3.	Engineering Rock Mechanics ; John, A. Hudson and John P. Harrison	1997

#### NAME OF DEPTT/CENTRE : CIVIL ENGINEERING

1. Subject Code : CE 531 Course Title : Advanced Soil Mechanics

2.	Contact Hours : L - 3; T -	1; P - 2/2
3.	Examination Duration (Hrs.) :	Theory 0 3 Practical
4.	Relative Weightage : CWS	PRS 1 5 MTE 3 0 ETE 4 0 PRE
5.	Credits : 0 4 6	. Semester : Autumn √ Spring Both
7.	Pre-requisite : Nil 8	Subject Area : Geotechnical Engineering

9. Objective of Course : To give advanced knowledge in the mechanics governing the behaviour of soils to students so that they are able to understand the behaviour of foundations and structures constructed in them.

10. Details of Course :

S.	Particulars	Contact
NO.		Hours
1.	Revision of fundamental aspects of Soil Mechanics; Characteristics of soil, Particulate nature, Weight volume relationship, Flow of water through soils, Permeability	03
2.	Theory of elasticity : Few aspects of elasticity, Plane stress and plane strain problems	04
3.	Pore water pressure under undrained loading, Determination of pore water pressure parameters	04
4.	Consolidation : Terzaghi's 1-D consolidation theory, Layered soils, Time dependent loading, 2-D problems, 3-D consolidation (axisymmetric problems, vertical drains), Creep/secondary consolidation and Basic of rheological models	12
5.	Stresses in soils / Shear strength : Mohr's circle, Stress paths, UU, CU, CD tests, Drained and undrained stress-strain relationships and shear strength	09
6.	Critical state theory : Normal consolidation line, Critical state line, Roscoe surface, Hvorslev surface, No tension line	03
7.	Constitutive laws for soils	05
8.	Slope stability analysis : Revision (infinite slope, method of slices, friction circle methods etc.), Bishop's modified method, Bishop's Rigorous Method, Janbu's method	05
	TOTAL	45

11. Laboratory Practicals :

Determination of Relative Density , Vane Shear Test, Oedometer Tests, Direct Shear and Tri-Axial Compression Test – UU, CU, CD tests Influence of Strain Rate, Stress Path Testing etc.

#### 12. Suggested Books :

S.	Name of Books / Authors	Year of Publication
No.		
1.	Advanced Soil Mechanics / Das, B.M.	2001
2.	Soil Mechanics / Lambe, T.W. and Whitman, R.V.	2000

#### NAME OF DEPTT/CENTRE : CIVIL ENGINEERING

1. Subject Code : CE-532 Course Title : Engineering Behaviour of Rocks

2. Contact Hours : L - 3; T - 1; P - 2/2

Practical 3. Examination Duration (Hrs.): Theory 0 3 4. Relative Weightage : CWS PRS 1 5 MTE 3 0 ETE 0 PRE 1 5 4 04 Credits : 5. 6. Semester : Autumn Spring Both 1 7. 8. Subject Area : Geotechnical Engineering Pre-requisite : Nil

 Objective of Course: To impart a comprehensive knowledge to the students on strength and deformational behaviour of rocks and rock masses, using which the students should be able to handle the real life problems related to rock engineering.

#### 10. Details of Course:

S. No.	Particulars	Contact hours
1	Introduction: Definitions; Development of rock mechanics; Activities and applications of rock mechanics and rock engineering.	01
	Properties of intact rocks- Types of specimens for testing- tolerance limits and requirements, preparation of specimens for laboratory tests.	01
	Uniaxial compressive strength tests- Factors affecting UCS; Modes of failures; stress strain curves, post failure behaviour, indirect methods.	03
2	Tensile Strength: Direct methods, Indirect methods, Miscellaneous methods.	03
	Shear tests: Single shear test, double shear test, punch test, direct shear test, oblique shear test.	01
	Triaxial strength test - Triaxial strength test, Coulombs theory, Mohr envelopes and p-q plots.	01
3.	Strength Criteria for intact rocks: Coulomb-Navier, Griffith's (1924), McClintock and Walsh (1962). Empirical failure Criteria by Bieniawski (1974), Hoek and Brown (1980), Ramamurthy (1993), Singh and Singh (2005)	05
	Classification of intact rocks- Geological classification, Geotechnical	02
4.	Classification of jointed rocks: Terzaghi (1946); Deere (1968); RQD; RMR; Q- systems; BGD; J <sub>f</sub> concept, RMI, GSI.	08
5	Strength behaviour of jointed rocks: Scale effect, Classification approaches.	08
6	Deformational behaviour of jointed rocks-Definitions, Computation of modulus of deformation through RMR, Q, GSI and J <sub>f</sub> . Constitutive modelling; Demonstration of UDEC.	05
7	Flow through jointed rock mass- Permeability, effect of stresses	02
	TOTAL	40

#### 11. Laboratory Practicals :

Physical properties, Uniaxial compression test, Brazilian test, Point Load strength index test, Triaxial compression test, Oblique shear test, Sonic wave velocity, Permeability test, Field shear test, Schmidt hammer test.

#### 12. Suggested Books:

SI	Name of Books / Authors	Year of Publication
1.	Comprehensive Rock Engineering Vol. 1 to 5	1993
2.	Rock mass classifications: A practical approach in civil engineering / Singh and Goel	1999
3	Practical rock engineering / Hoek E	2000

#### NAME OF DEPTT/CENTRE : CIVIL ENGINEERING

1. Subject Code : CE-533 Course Title : Soil Dynamics and Machine Foundations 2. Contact Hours : P - 0 L - 3; T - 1; 0 3 З. Examination Duration (Hrs.) : Theory Practical **Relative Weightage : CWS** PRS 00 2 5 5 4. 2 5 MTE ETE 10 PRE 04 Credits : 5. 6. Semester : Autumn Spring Both 1 7. Pre-requisite : Nil 8. Subject Area : Geotechnical Engineering

9. Objective of Course : To impart to the students basic knowledge in theory of vibrations and behaviour of soils under dynamic loads so that foundations for various types of structures and machines could be designed.

10. Details of Course :

S.	Particulars	Contact
No.		Hours
1.	Theory of Vibrations – Single, two and multiple degree of freedom systems, Vibration isolation, Vibration absorber, Vibration measuring instruments	09
2.	Strength characteristics : Factors affecting, Philosophy of design of equipments, Studies by dynamic triaxial and oscillatory shear equipments	04
3.	Liquefaction : Mechanism, Factors affecting, Studies by dynamic triaxial, Oscillatory shear box shake table and blast tests, Assessment of liquefaction potential	06
4	Dynamic Earth Pressures – Analytical and graphical methods, Displacement analysis of retaining walls	05
5.	Seismic stability of slopes : Modified Swedish circle and Taylor's method, Concept of yield acceleration and evaluation of displacement of embankment	04
6.	Machine Foundations – Types and basic requirements, Analysis and design of foundations for reciprocating and Impact type machines, Introduction to the design of T.G. foundations	08
7.	Determination of dynamic elastic constants – Various methods including block resonance tests, cyclic plate load tests. Wave propagation tests, Oscillatory shear box test, Soil liquefaction test	08
	TOTAL	44

11. Laboratory Practicals : Nil

#### 12. Suggested Books :

S.	Name of Books / Authors	Year of
NO.		Publication
1.	Soil Dynamics and Machine Foundations / S. Saran	1999
2.	Soil Dynamics / B.M. Das	2001
3.	Machine Foundations / B.M. Das	1993

#### NAME OF DEPTT/CENTRE : CIVIL ENGINEERING

1. Subject Code : CE-534 Course Title : Seepage in Foundations and Earth Structures



9. Objective of Course : The course is aimed to impart understanding of damaging effect of uncontrolled seepage in civil engineering structures. Therefore the objective of course is to equip the students with the methods of seepage analysis and control.

10. Details of Course :

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	S.	Particulars	Contact
	No.		Hours
	1.	Introduction – Seepage, situation and consequences of uncontrolled seepage in foundations, earth dams, roads, retaining walls, natural slopes and excavations, Seepage force, Critical gradient, Case studies	05
	2.	Basic Principles – Seepage principles, One dimensional flow, Elevation head, Pressure head and total head computations in one dimensional flow, situations, Permeability and its laboratory and field determination, Determination of hydraulic conductivity	05
	3.	Two Dimensional Flow – Laplace equation and its solution by graphical method, Flow nets in confined flow systems, Computation of seepage quality, Uplift pressure on structures, Flow through composite sections, Complex flow nets	05
	4.	Exit gradient, Piping, Filter design to prevent piping, Erosion protective filters, Longitudinal drains and blankets	05
	5.	Unconfined Flow – Unconfined flow around cutoffs, Determination of phreatic line, Flow nets in homogeneous and zoned earth dams under steady seepage and draw down conditions, Seepage control in earth dams – design of blanket, Toe and chimney filters, Influence of seepage, on slope stability, Seepage through earth dam founded on layer of finite depth with cut off wall	08
	6.	Natural Slopes – Stabilization of slopes by drainage methods, Drainage problems in paved areas roads and airfield drainage, Stability analysis of dam body during steady seepage	06
	7.	Seepage control in foundations and retaining walls, Construction dewatering, Ground improvement using sand drains, Design of sand drains, Hydraulic fracturing in embankment dams, Seepage control in earthern dam and levees, Use of synthetic filters	08
Γ		TOTAL	42

#### 11. Laboratory Practicals : Nil

#### 12. Suggested Books :

S.	Name of Books / Authors	Year of
INO.		Publication
1.	Advanced Soil Mechanics / Das, B.M.	2001
2.	Principles of Foundation Engineering / Das, B.M.	1999
3.	Soil Mechanics / Lambe, T.W. & Whitman, R.V.	2000

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#### NAME OF DEPTT/CENTRE : CIVIL ENGINEERING

1. Subject Code : CE-630 Course Title : Foundations on Weak Rocks

#### 2. Contact Hours : L - 3; T - 1; P - 2/2



8. Subject Area : Geotechnical Engineering

9. Course Objective : In hill regions, foundations of various structures are founded on rocks and rock masses. In view of the need of a large infrastructure development in hill regions, this course has been designed to impart knowledge for : i) design of foundations of structures like buildings, bridges, transmission towers, dams etc and ii) various remedial measures / treatment works required to be undertaken for strengthening of foundations of these structures.

#### 10. Details of Course :

S.	Particulars	Contact
No.		Hours
1	Engineering properties of weak rocks, different rock mass classification systems, relative merits and demerits	02
2	Failure criteria for weak rocks : Bi-linear Mohr-Coulomb failure criterion, Hoek and Brown criterion and modified Hoek and Brown failure criterion etc.	04
3	Effect of structural planes on rock foundations, possible modes of failure of foundations on rocks/ rock masses, determination of in-situ shear strength of rocks and rock masses	02
4	Requirements for satisfactory performance of foundations, Theories for ultimate bearing capacity of foundations on rocks and rock masses, theories of allowable bearing pressure of rock foundations using a nonlinear failure criterion, use and relevance of data from monotonic and cyclic plate load tests.	08
5	Evaluation of pressure-settlement characteristics of shallow foundations on rocks, effect of layering, anisotropy, heterogeneity and in-elasticity	04
6	Treatment of foundations - open joints, solution cavities, weak seams	02
7	Shallow foundations on sloping ground, raft foundations, stilt foundations, foundations for suspension bridges, transmission line towers, framed buildings etc.	05
8	Piles in Weak Rocks : bearing capacity and settlement of piles, piles in stratified rock masses, field load tests on piles in weak rocks, behaviour of bored / driven piles in soft / weathered rocks, case studies	06
9	Dam Foundations : Stability analysis, 3D wedge analysis of abutments of arch dams, dam-foundation interaction problems, influence of discontinuities like faults, fault zones, shear zones, seams etc on stability of dams, seepage below dam foundations etc.	06
10	Treatment of Dam Foundations : shear keys, dental treatment of faults, seams, grouting of cavities, grout curtains, cable anchors etc.	04
	TOTAL	43

11. Laboratory Practicals : Nil

12. Su	ggested Books :	
S. No.	Names of Books / Authors	Year of Publication
1	Foundations on Rocks, Wiley Pub.	1992
2	Rock Mass Classification – A Practical Engineering Approach, Singh, B. and Goel, R.K.	1999
3	ISRM Proceedings on Foundations on Weak Rocks	1991
4	Engineering Rock Mechanics by John A. Hudson and John P. Harrison, Pergamon Press, UK	1997

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#### NAME OF DEPTT/CENTRE : CIVIL ENGINEERING

1. Subject

Subject Code : CE-631 Course Title : Advanced Foundation Engineering

#### 2. Contact Hours : L - 3; T - 1; P - 2/2



9. Objective of Course : To impart knowledge of various theories for estimating bearing capacity and other characteristics like settlement, tilt etc. of different types of foundations.

#### 10. Details of Course :

S.	Particulars	Contact
No.		Hours
1.	Planning of soil exploration for different projects, Methods of subsurface exploration : Methods of borings along with various penetration tests	05
2.	Shallow Foundations : Requirements for satisfactory performance of foundations, Methods of estimating bearing capacity, Settlements of footings and rafts, IS Codes	04
3.	Pressure – Settlement characteristics from constitutive laws	04
4.	Pile foundations, Methods of estimating load transfer of piles, Settlements of pile foundations, Pile group capacity and settlement, Laterally loaded piles	06
5.	Well foundations – IS and IRC codal provisions, Elastic theory and ultimate resistance methods	06
6.	Tunnels and arching in soils, Pressure computations around tunnels	04
7.	Open cuts – Sheeting and bracing systems in shallow and deep open cuts in different soil types	04
8.	Coffer Dams – Various types, Analysis and design	04
9.	Foundations under uplifting loads, Underpinning of foundations	04
10.	Soil-structure interaction	03
	TOTAL	44

#### 11. Laboratory Practicals :

Exploratory Borings by different methods including Auger Boring, Wash Boring, Percussion Drilling and Rotary Drilling etc followed by - Planning of Soil Exploration for different projects, Standard Penetration tests, Dynamic Cone Penetration tests, Static Cone Penetration Tests, Plate Load Tests, Load Tests on Piles

#### 12. Suggested Books :

S.	Name of Books / Authors	Year of
No.		Publication
1.	Foundation Analysis and Design / Bowles	1991
2.	Design of Sub-Structures-Limit State Design / Saran, S.	1996
3.	Proceedings of International Conferences on Soil Mechanics and	
	Foundation Engineering	

#### NAME OF DEPTT/CENTRE : CIVIL ENGINEERING

1. Subject Code : CE-632 Course Title : Applied Rock Mechanics

#### 2. Contact Hours : L - 3; T - 1; P - 0

3.	Examination Duration (Hrs.) :	Theory 0	3	Prac	ctical	-	-		
4.	Relative Weightage : CWS 2 5	PRS	MTE	2 5	ETE	5 0	PRE	-	-
5.	Credits : 0 4 6.	Semester : Au	itumn [	Sŗ	oring		Both		

7. Pre-requisite : CE 532 Engineering Behaviour of Rocks

#### 8. Subject Area : Geotechnical Engineering

9. Objective of Course : In view of the present thrust in the area of Infrastructure development, any Geotechnical Engineer should have a certain minimum knowledge of analysis and design of variety of structures, either excavated in rocks like tunnels, caverns etc. or founded on rocks like suspension/other bridges etc.

10. Details of Course :

S.	Particulars	Contact
No.		Hours
1.	Stereographic projection method – Applications to rock slopes and underground openings	04
2.	Application of rock mass classification systems in the evaluation of stability of slopes, underground openings and design of foundations	.04
3.	Elastic stress distribution around circular openings, Uniaxial and biaxial stresses	04
4.	Theories of support pressure–Elasto-plastic theories for tunnels, Large underground openings (tunnels and caverns for power house and storages), Analysis and design of support systems for openings, Design of rock bolts and pre-stressed cable systems, Case Histories, Grouting in Rock	10
5.	Buildings, Bridges and Dam foundations – Effect of dip of joints on bearing capacity, Stability of Abutments and foundations, Case Histories.	10
6.	Stability of Slopes : Plane, Circular and three dimensional wedge analysis, Software packages on Landslides, Slope stabilization techniques	06
7.	Field Instrumentation for slope and large underground excavations	02
	TOTAL	40

#### 11. Laboratory Practicals : Nil

#### 12. Suggested Books :

S.	Name of Books / Authors	Year of
No.	· · ·	Publication
1.	Rock Slope Engineering / Hoek and Bray	2003
2.	Comprehensive Rock Engineering Vol. 1 to 5	1993
3.	Rock Mass Classification, A Practical Engineering Approach / Singh, B.	1999

#### NAME OF DEPTT/CENTRE : CIVIL ENGINEERING

1.

Subject Code : CE-633 Course Title : Design of Substructures

2. Contact Hours : L-3; T-1; P - 0



9. Objective of Course : This course is aimed to train the students in design and detailing of foundations of various structures including both shallow and deep foundations.

10. Details of Course :

S.	Particulars	Contact
1.	Introduction : Substructures – Definition and purpose, role of foundation engineer : Basic soil input parameters for foundation design	Hours 01
2.	Foundation Design : General principles: Types of foundations, selection of type of foundation, Basic requirements, Computation of loads	02
3.	Limit State Design : Basic principles	02
4.	Shallow Foundations : Types and their selection, Conventional method of design, Beams on elastic foundation and Finite difference method of analysis, Structural design of footings and rafts; Foundations subjected to eccentric-inclined loads, Footings in seismic zones	10
5.	Pile Foundations : Type, Construction techniques, Proportioning of pile foundations; loads/forces considered for structural design, Structural design of pile and pile cap, Design of pile foundation for a multistoreyed buildings and other important structures, Pile foundations subjected to dynamic loads	08
6.	Bridge Substructures – Forces on bridge Foundation (IRC & IRS specifications), Design of piers, Abutments and Wing Walls, Well Foundation Components, Stability analysis, Design of various components, Materials for construction, Sinking of well, Placing of curb, Dredging and Jetting	10
7.	Marine Substructures : Types, Breakwaters, Wharves, Sea Walls, Design and Construction methods	04
8.	Foundations of transmission line towers, Forces on tower foundation, General design criteria, Choice & type of foundation, Design procedure	05
	TOTAL	42

#### 11. Laboratory Practicals : Nil

#### 12. Suggested Books :

S. No.	Name of Books / Authors	Year of Publication
1.	Foundation Analysis and Design / Bowles	1991
2.	Design of Sub-Structures-Limit State Design / Saran, S.	1996

#### NAME OF DEPTT/CENTRE : CIVIL ENGINEERING

1. Subject Code : CE-634 Course Title : Design of Underground Excavations

2.	Contact Hours : $L - 3$ ; $T - 1$ ; $P - 0$
3.	Examination Duration (Hrs.) : Theory 0 3 Practical
4.	Relative Weightage : CWS       2       5       PRS       -       MTE       2       5       ETE       5       0       PRE       -
5.	Credits : 0 4 6. Semester : Autumn Spring J Both
7.	Pre-requisite : CE 532 Engineering Behaviour of Rocks

#### 8. Subject Area : Geotechnical Engineering

9. Course Objective : The subject is aimed at teaching methods of design of underground excavations like underground tunnels, caverns, storage chambers, waste disposal facilities and various appurtenant structures of a hydropower project like surge chambers, shafts etc. when excavated in rocks and jointed rock masses.

10. Details of Course :

S.	Particulars	Contact
No.		Hours
1	Introduction: Underground excavations for various infrastructure projects, problems associated with construction	03
2	Various preliminary investigations to be undertaken before planning and designing projects involving large underground constructions – drilling, coring and sampling, geophysical investigations and their interpretation	05
3	Application of stereographic projection method in underground excavation design	03
4	Elastic stress distribution around tunnels of different shapes and under different in-situ stress conditions, Greenspan method for non-circular shapes of tunnels, Design principles, multiple openings, openings in laminated/stratified rocks.	06
5	Elasto-plastic analysis of tunnels, Daemen's theory, Rock Mass-Tunnel Support Interaction Analysis, concept of ground response and support reaction curves, Ladanyi's (1974) elasto-plastic analysis of tunnels	04
6	Design of various support systems including concrete and shotcrete linings, steel sets, rock bolting and rock anchoring, combined support systems, estimation of load carrying capacity of rock bolts	02
7	Merits and demerits of rock mass classification systems as applied to excavations in jointed rock masses, concept of elastic(competent), in-elastic (incompetent), squeezing and swelling ground conditions	04
8	Analysis of tunnels, shafts and caverns in squeezing and swelling ground conditions, Empirical methods of analysis and design, various methods of estimation of elastic modulus and modulus of deformation of rocks using uni-axial jacking / plate jacking tests, radial jacking and Goodman jacking tests	05
9	Long term behaviour of tunnels and caverns, effect of saturation	02
10	In-situ stress determination using flat jack, hydraulic fracturing and over coring techniques and USBM type drill hole deformation gauge, single and multi-point bore hole extensometers, load cells, pressure cells, etc., Instrumentation and Monitoring of underground excavations during and after construction, Various Case studies	05
11	New Austrian Tunneling Method (NATM), Norwegian Tunneling Method (NTM)	02
	TOTAL	44

#### 11. Laboratory Practicals : Nil

#### 12. Suggested Books :

S.	Names of Books and Authors	Year of
No.	5 x	Publication
1.	Comprehensive Rock Engineering Vo 1 to 5	1993
2	Engineering Rock Mechanics, John A. Hudson and John P. Harrison, Pergamon Press, UK,	1997
3	Rock Mass Classification Systems – A Practical Engineering Approach, Singh, B. and Goel, R.K.	1999

#### NAME OF DEPTT. / CENTRE :

**CIVIL ENGINEERING** 

1. Subject Code : CE-635

Course Title : Ground Improvement Engineering

<ol><li>Contact Hours</li></ol>	; ;	L - 3,	T - 1,	P-0
---------------------------------	-----	--------	--------	-----

3.	Examination Duration (Hrs)	: T	heory	0	3		Practi	cal [	-	-					
4.	Relative Weightage : CWS	2	5	PRS	-	-	MTE	2	5	ETE	5	0	PRE	-	-
5.	Credits : 0 4	6.	Seme	ester :	Autu	mn		Sprir	ng [		Both				
7.	Pre-requisite : Nil	8.	Subje	ect Area	a:G	eote	chnical	l Eng	ineel	ring					-

9. Course Objective : Due to large scale industrialization, civil engineering structures often get constructed on weak/filled up ground. This course is framed to impart the techniques of strengthening weak foundation soil to make it a competent supporting media.

10. Details of Course :

S.	Particulars	Contact
No.		Hours
1	Introduction, Typical situations where ground improvement becomes necessary, Historical review of methods adopted in practice, Current status and the scope in the Indian context	05
2	Methods of Ground Improvement : Mechanical compaction, Dynamic compaction, Impact loading, Compaction by blasting, Vibro-compaction; Pre-compression, Dynamic consolidation, Stone columns; Use of admixtures, Injection of grouts; Design guidelines and quality control, Design examples on preloading with sand drains	14
3	Reinforced Earth : Basic mechanism, Constituent materials and their selection; Engineering applications – Shallow foundations on reinforced earth, Design of reinforced earth retaining walls, Reinforced earth embankments structures, Wall with reinforced backfill, Analysis and design of shallow foundations on reinforced earth	10
4	Getoextiles : Selection and engineering applications, Design examples, Stabilisatrion/Improvement of ground using Geomembranes, Geocells, Geonets	07
5	Soil Nailing : Use of ply soils, Improvement of saline soils, Improvement of black botton soils	06
	TOTAL	42

11. Laboratory Practicals : Nil

12.	Suggested Books :		
S.	Names of Books and Authors		Year of
No.		ŧ	Publication
1	Reinforced Soil and Its Engineering Applications /Saran, S.		2005
2	Theory and Practice of Foundation Design / Som N.N. and Das, S.C.		2003
3	Principles of Foundation Engineering / Das, B.M.		1999

1.8 2.09 2.09

#### NAME OF DEPTT. / CENTRE : CIVIL ENGINEERING

1. Subject Code : CE-636

Course Title : Excavation Technology

2. Contact Hours : L - 3, T - 1, P - 0

3.	Examinatior	n Duration (H	-Irs)	:Theo	ory :	0	3	] P	ractica	al : [	0	0					
4.	Relative We	eightage : CN	ws	2	5	PRS	0	0	мте[	2	5	ETE	5	0	PRE	0	0
5.	Credits :	04	6.	Sem	ester	:	Autu	nn		Sprir	ng [		Both	$\checkmark$			

7. Pre-requisite : CE-532 Engineering Behaviour of Rocks

8. Subject Area : Geotechnical Engineering

9. Course Objective : The subject is aimed at teaching the technology used for excavation of underground structures like tunnels, shafts, caverns, storage chambers, surge chambers etc. when excavated in soils, rocks and jointed rock masses.

10. Details of Course :

S.	Particulars	Contact
No.		Hours
1	Construction, Planning & Scheduling : Importance of planning, pre-planning analysis,	04
	Network planning including CPM & PERT techniques	
2	Contract Management : Contractual Risks & Risk Management	04
3	Excavation in Soils : Tractors, Dozers, Bulldozers, Wheel Loaders, Showels, Draglines,	04
	Buckets, Clamshells, Scrappers, Hydraulic Excavators.	
4	Excavations in Rocks : Manual exavation tools and techniques, Drilling and blasting versus Rinning	03
5	Excavation of Dam Foundations : Controlled drilling and blasting. Selection and matching	04
Ŭ	of loading and hauling equipments.	04
6	Excation of Tunnels and Caverns : Type of cuts and drilling patterns, Methods of tunnel driving, Excavation cycles, Full face heading, heading and benching, Ring drilling method, Forepoling, Side drift method, Presplitting and smooth blasting, Excavation in different ground conditions, mixed face tunneling.	06
7	Machine Tunneling : Shield tunneling, Types of tunnel boring machines, new dimensions in TBMs, New Austrian Tunneling Method (NATM), Norwegian Tunneling Method (NTM), TBMs versus Drilling and blasting, TBM in different ground conditions, Limitations of machine tunneling.	08
8	Excavation of Shafts and Caverns : Excavation with limit raise climber, Shaft boring,	06
_	lining segments for shield driven tunnels, Different stages in excavation of caverns.	
9	Ventilation in Long Tunnels	02
	TOTAL	41

11. Laboratory Practicals : Nil

12.	Suggested Books :	
S.	Names of Books and Authors	Year of
NO,_		Publication
1	Heavy Construction –Planning, Equipment and Methods by Jagman Singh, Oxford & IBH Pub. Co. Pvt. Ltd., N. Delhi	2001
2	Construction Project Management by K.K. Chitkara, Tata McGraw Pub. Co. Ltd., N.Delhi.	1998
3	Underground Excavations, Hoek, E. and Brown, E.T., The Institution of Mining and Metallurgy, London.	1988
4	Rock Engineering by John Franklin and Maurice Dusseault, Tata McGraw Pub. Co. Ltd., N.Delhi.	1989

#### NAME OF DEPTT/CENTRE : CIVIL ENGINEERING

1. Subject Code : CE-637 Course Title : Rock Slope Engineering

2.	Contact Hours : L - 3; T - 1; P - 0
3.	Examination Duration (Hrs.) : Theory 0 3 Practical
4.	Relative Weightage : CWS       2       5       PRS       -       MTE       2       5       ETE       5       0       PRE
5.	Credits : 0 4 6. Semester : Autumn Spring J Both
7.	Pre-requisite : CE-532 Engineering Behaviour of Rocks

8. Subject Area : Geotechnical Engineering

9. Objective of course: Failure of rocks or Landslides is a very common phenomenon in road cuts and hilly regions and results in heavy loss of life and property. The course is designed to identify various modes of rock failures and study their safety aspects including provision of remedial measures.

#### 10. Details of Course:

S,No.	Particulars	Contact
		Hours
1	Introduction – Classification of natural slopes and excavation failures, Slope	
	stability – Mechanics of slope failure, Failure modes.	05
2	Collection and analysis of Geological Data - Field survey and testing,	
	Graphical presentation of geological data and evaluation of potential slope	09
	problems	
3	Shear Strength behaviour of Rock Masses using Patton's, Barton's, Ladanyi	
	and Archambault, Hoek & Brown and other empirical failure criteria,	10
	Classification techniques; Estimation of peak and residual shear strength	
	parameters in field. Rock Hydraulics, Insitu permeability tests	··· <del>·</del> ·
4	Design of Rock Slopes and Open Cuts – Methods of slope stability analysis,	
	Plane failure and wedge failure, circular failure and Over toppling failure,	10
	Hoek & Bray's charts, Three dimensional wedge analysis, Seismic	
	considerations, Computer programs, Use of non-linear failure criteria in slope	
	stability analysis.	
5	Strengthening Measures – Retaining walls, Stabilization and strengthening of	
	rock slopes, Shotcreting and rock bolting, Surface protection of slopes,	03
	Surface and subsurface drainage.	
6	Instrumentation and Monitoring of Slopes and Slope Movements, Warning	
	devices, Maintenance of slopes, Landslide Hazard Zonation (LHZ) Mapping,	03
	Monitoring.	
7	UDEC Modelling	04
	TOTAL	44

#### 11. Laboratory Practicals : Nil

#### 12. Suggested Books:

S.No.	Name of Books / Authors	Year of
		Publication
1	Rock Slope Engineering / Duncan C. Willey	2003
2	Software for Engineering Control of Landslides and Tunnelling hazards /	2002
	Singh, B. and Goel, R.K	
3	Discontinuity Analysis in Rock Engineering / Priest, S.D.	1993
4	Rock Slope Engineering / Wyllie and Mah	2001

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#### Appendix 'E' Item No.15.2.11

#### INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

#### ACADEMIC CALENDAR FOR THE AUTUMN SEMESTER, 2006 – 2007 (JUNE 20, 2006 to JANUARY 02, 2007)

1.	J.E.E. COUNSELLING FOR B.TECH./B.ARCH.	JUNE 20-JUNE 23,	TUE-FRI
0		LUNE 23 2006	FRIDAV
2.	LAST DATE FOR SUBMISSION OF M TECH /	UNE 20, 2000	FDIDAV
3.	MARCH /MURP / M PHIL / M So & M TECH	00110 30, 2000	FRIDAT
	DESSERTATION		
4.	EXAMINATIONS FOR SUMMER TERM.	JULY 07-08, 2006	FRI SAT.
5.	DECLARATION OF RESULTS FOR SUMMER	JULY 10, 2006	MONDAY
6	TERM EXAM.		MONDAY
0.	DESSERTATION OF WILLECH.	3011 10, 2000	MONDAI
7	INSTITUTE REOPENS FOR THE SESSION	JULY 17 2006	MONDAY
' .	2006-2007.		
8.	REGISTRATION FOR ALL PG AND Ph.D.	JULY 25, 2006	TUESDAY
	STUDENTS (NEW ENTRANTS)	,	
9.	COUNSELLING/REGISTRATION FOR PG	JULY 25, 2006	TUESDAY
	STUDENTS AGAINST VACANT SEATS ONLY	(AFTERNOON)	
	(EXCEPT FOR MBA PROGRAMME)	<u></u>	
10.	REGISTRATION FOR ALL UG/PG/Ph.D.	JULY 25, 2006	TUESDAY
	STUDENTS (OTHER THAN NEW ENTRANTS) IN	(10 A.M. ONWARDS)	
11	ODIENTATION FOR LIG STUDENTS	1ULV 25 2006	TUESDAV
11.	(NEW ENTRANTS)	0011 23, 2000	TUESDAT
12	ORIENTATION FOR PG STUDENTS	JULY 26, 2006	WEDNESDAY
	(NEW ENTRANTS )		
13.	CLASSES BEGIN FOR ALL UG/PG COURSES	JULY 26, 2006	WEDNESDAY
	(OTHER THAN NEW ENTRANTS) AND Ph.D.		
	PROGRAMMES.		· · · · · · · · · · · · · · · · · · ·
14.	REGISTRATION FOR ALL UG COURSES	JULY 26, 2006	WEDNESDAY
	(NEW ENTRANTS).		
15.	CLASSES BEGIN FOR ALL COURSES	JULY 27, 2006	THURSDAY
16	(NEW ENTRANTS)	ALLOUGT OI & OO	
10,	N C C DADADE ODOLINDS OF 3 HA CTE NCC	$2006(\Delta T \times 0.0 \times$	WEDNESDAY &
1.17	ACCONMENTE OF HIS DECIDE	2000 (AT 0.00 A.M.)	TEDILESDAT
17.	ASSIGNMENT OF UG PROJECT	AUGUST 04, 2006	FRIDAY
18.	LAST DATE FOR SUP FOT DECISTRATION OF	AUGUST 07, 2006	MONDAY
19.	LAST DATE FOR SUBJECT REGISTRATION OF UC/PC/Ph D STUDENTS (NEW ENTRANTS)	AUGUSI 07, 2000	
20	DEPARTMENTS TO SEND THE LISTS OF	AUGUST 18 2006	FRIDAY
20.	INSTITUTE ELECTIVES TO UG SECTION TO		
	BE RUN IN SPRING SEMESTER – 2006-2007	· · ·	
21.	LAST DATE OF SUBMISSION OF SEMINAR	AUGUST 31, 2006	THURSDAY
	(PG STUDENTS)		
	·		

22.	UG & PG SECTIONS TO SEND TO DEPTTS/CENTRES FINAL LISTS OF REGISTERED STUDENTS.	SEPTEMBER 01, 2006	FRIDAY
23.	MID TERM EXAM.I FOR ALL UG/PG STUDENTS INCLUDING PREPRATORY COURSE FOR UG COURSES	SEPT. 07-08, 2006	THURSDAY & FRIDAY
24.	LAST DATE FOR WITHDRAWAL FROM A COURSE(S).	SEPTEMBER 14, 2006	THURSDAY
25.	LAST DATE FOR DISPLAY OF ATTENDANCE RECORD OF STUDENTS FALLING SHORT OF MINIMUM ATTENDANCE REQUIREMENTS DURING THE MIDDLE OF SEMESTER (BY DEPARTMENTS/CENTRES)	SEPTEMBER 19, 2006	TUESDAY
26.	ANNUAL CONVOCATION -2006	SEPTEMBER 21, 2006	THURSDAY
27.	INTIMATION TO PARENTS/GUARDIANS OF STUDENTS HAVING "SHORT ATTENDANCE" BY ACADEMIC SECTION (UGS AND PGS&R)	SEPTEMBER 26, 2006	TUESDAY
28.	INTIMATION TO THE STUDENTS (UGS) ABOUT THE INSTITUTE ELECTIVES TO BE RUN DURING SPRING SEMESTER 2006-07 BY THE ACADEMIC SECTION.	SEPTEMBER 26, 2006	TUESDAY
29	LAST DATE FOR SUBMISSION OF PROJECT (PG STUDENTS)	SEPTEMBER 30, 2006	SATURDAY
30.	LAST DATE OF SUBMISSION OF REMAINING DOCUMENT(S) BY ALL NEW ENTRANTS	OCTOBER 03 , 2006	TUESDAY
31.	SEMESTER BREAK (FOR STUDENTS ONLY)	OCTOBER 03-06, 2006	TUEFRI.
32.	PRE SUBJECT REGISTRATION OF INSTITUTE ELECTIVES FOR SPRING SEMESTER OF 2006-07 FOR UG STUDENTS	OCTOBER 13-18, 2006	FRI WED.
33.	MID TERM EXAM. II FOR ALL UG/PG STUDENTS	OCTOBER 16 & 17, 2006	MONDAY & TUESDAY
34.	ISSUE OF BLANK PROGRESS FORMS FOR Ph.D. STUDENTS BY THE PG SECTION TO RESPECTIVE DEPTTS./CENTRES	NOVEMBER 01, 2006	WEDNESDAY
35.	LAST DATE FOR FINALIZATION OF TIME TABLES OF SPRING SEMESTER-2006-07 SESSION BY ALL DEPARTMENTS/CENTRES	NOVEMBER 01, 2006	WEDNESDAY
36.	PRE SUBJECT REGISTRATION FOR SPRING SEMESTER FOR THE SESSION 2006-2007	NOV. 06-07, 2006	MON. –TUE.
37.	FILLING OF RESPONSE FORMS BY UG/PG STUDENTS IN THE RESPECTIVE DEPARTMENTS/CENTRES	NOV. 06-10, 2006	MONFRI.
38.	NOTIFICATION OF SEATING PLAN FOR AUTUMN SEMESTER EXAM	NOVEMBER 06, 2006	MONDAY
39.	NOTIFICATION OF DATES OF EXAM FOR COMMON SUBJECTS	NOVEMBER 10, 2006	FRIDAY
40.	INFORMATION REGARDING SHORT ATTENDANCE CASES TO ACADEMIC SECTIONS UGS AND PGS&R BY DEPARTMENTS/ CENTRES	NOVEMBER 14, 2006	TUESDAY

41.	LAST DATE OF TEACHING FOR ALL UG/PG CLASSES.	NOVEMBER 22, 2006	WEDNESDAY
42.	DISPLAY OF COURSE WORK EVALUATION	NOVEMBER 23, 2006	THURSDAY
43.	NOTICES TO STUDENTS' NOTICE BOARDS REGARDING SHORTAGE OF ATTENDANCE (BY DEPARTMENTS/CENTRES)	NOVEMBER 23, 2006	THURSDAY
44.	ACTION BY ACADEMIC SECTIONS UGS AND PGS&R TO ASCERTAIN THAT THE DETAINED STUDENTS DO NOT APPEAR IN EXAM.	NOVEMBER 23 2006	THURSDAY
45.	LAST DAY OF EVALUATION OF M.TECH. DESSERTATION FOR 3 <sup>RD</sup> SEMESTER & SENDING OF SATISFACTORY/UNSATISFACTORY REPORT TO A.R.(PGS&R) BY DEPARTMENTS/CENTRES	NOVEMBER 24, 2006	FRIDAY
46.	PRACTICAL EXAMINATIONS, IF ANY	NOV. 24 TO 26, 2006	FRISUN.
47.	*END TERM EXAM. FOR ALL UG/PG/Ph.D. CLASSES INCLUDING PREPRATORY COURSE	NOV. 27 TO DEC. 05, 2006	MONDAY TO Ist TUESDAY of DEC.
48.	NCC CAMP	TO BE DECIDED BY DOSW	
49.	J.M.E.T2007 EXAMINATION	DECEMBER 10, 2006	SUNDAY
50.	LAST DATE TO SHOW THE ANSWER SCRIPT OF END TERM EXAMINATION TO THE STUDENTS	DECEMBER 11, 2006	MONDAY
51.	FINALIZATION OF GRADES BY THE GRADE MODERATION COMMITTEES	DECEMBER 12, 2006	TUESDAY
52.	DISPLAY OF GRADES FOR ALL CLASSES ON DEPARTMENT NOTICE BOARD	DECEMBER 12, 2006	TUESDAY
53.	LAST DATE FOR SENDING OF GRADES TO ACADEMIC SECTIONS UGS & PGS&R AFTER SCRUTINY	DECEMBER 12, 2006	TUESDAY
54.	SUBMISION OF PROGRESS REPORTS OF THE Ph.D. STUDENTS BY THE DEPTTS./CENTRES TO A.R. (PGS&R)	DECEMBER 15, 2006	FRIDAY
55.	LAST DATE FOR DECLARATION OF AUTUMN SEMESTER RESULTS	DECEMBER 15, 2006	FRIDAY
56.	WINTER VACATIONS FOR TEACHING STAFF	DEC. 16-31, 2006	SAT. To last SUN.
57.	SPRING SEMESTER 2006-2007 BEGINS	JANUARY 01, 2007	MONDAY
58.	REGISTRATION FOR ALL COURSES IN RESPECTIVE DEPTTS./CENTRES	JANUARY 01, 2007	MONDAY
59.	CALSSES BEGIN FOR ALL COURSES	JANUARY 02, 2007	TUESDAY

\*The Practical Examination may be organised by the departments during the last practical engagement of a particular batch/class before November 22, 2006 or between 24-26.11.2006.

Note: - Heads of Departments are requested to plan the functions / Seminar on Saturdays' and Sundays' so that the Institute is able to maintain the Minimum Teaching days required in a semester.

#### INDIAN INSTITUTE OF TECHNOLOGY

#### Name of Department: Humanities & Social Sciences

1.	Subject Code: IHS-74/75
2.	Course Title: Entrepreneurship Development: Strategies
3.	Contact Hours: L: 03; T: 01; P:0
4.	Examination Duration (Hrs.): Theory 0 3 Practical 0 0
5.	Relative Weightage:   CWS   25   MTE   25   ETE   50
6.	Credits: 04
7.	Semester Yes
8.	Pre-requisite: Nil 9. Subject Area: Economics

#### 10. Objective:

The objective of the course is to help the students to understand concept and importance of entrepreneurship and to help them to develop necessary skills to cope with the rigours of an entrepreneur.

#### 11. Details of Course:

S.No.	Particulars	Contact
		Hrs.
1.	Introduction to Entrepreneurship Development:	8
	Entrepreneurial Motivation Development: Entrepreneurial Motivation Training (EMT)	
	Lab, Propositions, Objectives of EMT, Exercises for Entrepreneurship Motivation Training	
2.	Source of help for Entrepreneurs: Identification and Selection of Good Business	6
	Opportunity: Search for an opportunity and selecting the right product, market Survey and	-
	research, Techno-economic feasibility Assessment: Preliminary Project Report (PPR).	
3.	Raising Money for Your Venture: Sources of Finance, Your Business Plans: Detailed	4
1	Project Report (DPR), Presenting Your Case for a Term Loan	
4.	Establishing Your Venture: Selecting Right infrastructure, Buying machinery, Sources of	.4
	Technology and its Evaluation, Recruiting the Right people, project Implementation	
5.	You and Your Market: Marketing Management for Small Business, Selling and Sales	3
	Promotion	
б.	Managing for Production and Productivity: Production Management	5
7.	Managing Your Scarce Resources ' FINANCE': Management of Working Capital.	4
	Costing, Break-even Analysis: Concept and Implications for planning and Decision making	-
8.	Knowing Your Directions: Where you are Heading?: Management in Small Scale	4
	Enterprise, Book Keeping, Financial Accounting for Technical Entrepreneurs, Monitoring	
	Progress Through Network Analysis, Guidance norms for new entrepreneurs	
9.	Plans for Survival, Case Studies	4
	Total	42

#### **Suggested References:**

SI.	Name of Books / Authors	Year of
No.		Publication
1.	A Handbook for New Entrepreneurs, Entrepreneurship Development Institute of India (EDII), Gandhinagar, Oxford University Press	2003
2.	Developing New Entrepreneurs, Entrepreneurship Development Institute of India (EDII), Gandhinagar	2000
3.	Trainers' Manual on Developing Entrepreneurial Motivation, National institute for Entrepreneurship & Small Business Development, New Delhi	2000
4.	The Entrepreneurial Connection by Narula, Gurmeet, Tata McGraw-Hill Publishing Company Ltd. New Delhi.	2001

SECOND YEAR														
		SUBJECT TITLE	rea		CON HO	TACT URS		Ex Dura	am ation		WE	IGHT	AGE	r 
S.NO.	COURSE		Subject A	CREDITS	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
TE	HRD SEN	AESTER												
1	HS-211	Introduction to Economics & IPR	HS	3	2	1	0			25		25	50	-
2	CY-261	Inorganic Chemistry	BS	4	3	1	0.	3		25	-	25	50	Ţ
3	GL-211	Physical Geology	ES	4	3	1	0	<u>3</u>	-	25		25	50	-
4	GL-212	Structural Geology	ES.	4	3	0	2	3	2	15	10	25	35	15
5	GL-213	Crystallography and Mineralogy	ES	4	3	0	2	3	2	15	10	25	35	15
6	GL-214	Stratigraphy	ES	4	3	1	0	3	0	25	_	25	50	
		Total Credits		23	17	4	4		A.	~.		<i>n.</i> .		
FC	URTH S	L'MESTER					· · ·			2.4	ŝ.			
1	BM-202	Management Basics	BM	2	2	0	0	2		25	4	25	50	-
2	H3212	Behavioral Science	HS	2	2	0	)			× *		40	50	
5	Mr - 2.4	Numerical Methods	BS	3	2	1	0			25	-	25	50	
4	Gi 221	I'etiology	ES	_4	3	0	2	3	2	15	16	25	35	15
5	GL 222	Paleontology	ES	4	3	0	2	3	?	_15_	10	25	35	15
6	G 223	Field Training-I	ES	4	-	-	8		-			1		100
		Tota: Credits	[	19	11	1	12							

#### CURRICULUM STRUCTURE FIVE YEAR INTEGRATED M.TECH. COURSE IN APPLIED GEOLOGY

#### CURRICULAR STRUCTURE FOR 5 YEAR INTEGRATED M. Sc./M.Tech PROGRAMMES IN SCIENCES\* 2<sup>nd</sup> Year

			Teaching Schen (Hrs./Week)	Exan Dura (Hrs.	1. tion )	Relative Weightage (%)						
S.No.	Subject Code	COURSE TITLE	SUBJECT AREA	CREDITS	Ρ	Theory	Practical	CWS	PRS	MTTE	ETE	PRE

TTL COMARCE INTO A TIPET IN ANT	
1.         HS-211         Introduction to Economics &         HS         3         2         1         0         2         -         25         -         25         50	
2. CY-261 Inorganic Chemistry-I BS 4 3 1 C 3 - 25 - 25 50	-
3. MA-257 Transform Methods B5 3 2 1 0 2 - 25 - 25 50	-
4. MA-253 Mechanics BS 5 2 1 0 2 - 25 - 25 50	-
5. PH-211 Mechanics, Oscillations and BS 5 3 1 2 3 - 15 15 30 40 Properties of Matter	-
6. CY-251 Physical Chemistry - I BS 4 3 1 0 3 - 25 - 25 50	-
Sub Total 22 15 6 2	

#### IV SEMESTER (SPRING)

1		· · · · · · · · · · · · · · · · · · ·				· · · · · · · · ·								_
1.	BM-202	Management Basics	BM	2	2	0	0	2		25		25	50	-
2.	HS-212	Behavioral Science	HS	2	2	0	0	2	-	-	(	40	60	-
3.	MA-252	Complex Analysis I	BS	3	2		0	2	-	25		25	50	-
4.	MA-254	Numerical Methods	BS	3	2	1	10	2	-	25		25	50	- 1
5.	PH-212	Electrostatics,	BS~	5	3	$1^{-1}$	2	3	-	15	15	30	40	1 -
·	I	Magnetostatics and		¦ •••		<b>}</b>	ļ	1	1		1			1.
		Thermodynamics		<u> </u>	<u> </u>			<u> </u>		l				
6.	CY-252	Organic Chemistry – I	BS	4	3	1	0	3	-	25	-	25	50	-
7.	CY-262	Lab - 2	BS	2	0	0	4		4	·	25	25		50
			Sub Total	21	13	4	6			1				

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\* Excepting M.Tech. (Applied Geology)

C) O

#### Aparna Mukherjee (M.Sc. Chemistry Previous)

Dr. G. Pande Medal for obtaining highest CGPA in M.Sc. (Previous) examination,

#### Vikramjit Singh Saini (MBA)

Mr. Harish & Ms. Veena Midha cash prize of Rs. 10000/- for excellence in Human Resources Management Studies in MBA 1<sup>st</sup> year.

#### Harshita Sial (MBA)

Balmer Lawrie Endowment Cash Prize of Rs. 10000/- for obtaining highest CGPA in Technology Management Paper in Department of Management Studies.

#### Saket Gupta B.Tech. (Civil) II year

- 1. Prameshwari Das Lakshman Swarup Agarwal Memorial Cash Prize of Rs. 1000/for obtaining highest CGPA in B.Tech. (Civil) I Year class.
- 2. Rai Saheb Dr. B.M. Lal Cash Prize of Rs. 1000/- to a student of B.Tech.(Civil) | year for obtaining highest CGPA in Graphics I

#### Ms. Nitika Nathani B.Tech. (CSE) II year

Rai Singh Jain Cash Prize of Rs. 3000/-for the girl student obtaining highest CGPA in B.Tech. (CSE/E&C/Elect.) ! Year

#### Abhishek Gupta B.Tech. (CSE) li year

Rai Singh Jain & Mrs. Shakuntla Devi Jain Cash Prize of Rs. 3000/- for the student (Male or Female) obtaining highest CGPA in B.Tech (CSE/E&C/Elect.) | Year.

#### Ms.Tulika Garg B.Tech. (E&C) III year

- 1. Rai Singh Jain & Smt. Shakuntla Devi Jain Cash Prize of Rs. 3000/- for the student (Male or Female) obtaining highest CGPA in B.Tech. (CSE/E&C/Elect.) II Year.
- 2. Rai Singh Jain Cash Prize of Rs. 3000/- for the girl student obtaining highest CGPA in B.Tech. (CSE/E&C/Elect.) II Year

#### Rubal Dua B.Tech. (Chem.) III year

- 1. Dr. N. Gopal Krishna Medal for obtaining highest CGPA in B.Tech. (Chem.) II Year.
- 2. Prof. B.S. Varshney Memorial Cash Prize of Rs. 5000/- for securing highest CGPA in the following three subjects:

CH- 207 Principles of Thermodynamics

- CH-206 Application of Thermodynamics
- CH-204 Transfer Processes I (Heat Transfer)

#### Vibhor Kumar B.Tech. (Civil) III year

Rai Bahadur Khushi Ram Sud & Smt. Durga Devi Sud Memorial Cash Prize of Rs. 2000/- for obtaining highest CGPA in B.Tech. (Civil) II Year class.

#### Ms. Pallavi Tiwari B.Tech. (Civil) IV year

Lt. Gen. Ram Adhar Loomba Cash Prize of Rs. 1000/- for the student who obtains highest CGPA in B.Tech.(Civil) III Year (among girl students)

#### Ravi Anand Gupta B.Tech. (Civil) IV year

- Lt. Gen. Ram Adhar Loomba Cash Prize of Rs. 1000/- for obtaining highest CGPA in B.Tech. (Civil) III Year (among boy students).
- 2. Tara Chand Kanti Devi Cash Prizes of Rs. 2500/- to the student scoring highest C.G.P.A. in B.Tech. Civil III Year

#### Ms. Shilpa Agarwal B.Tech. (Elect.) IV year

- 1. Prof. P. Mukhopadhyay Cash Prize of Rs. 2000/- for obtaining highest CGPA in B.Tech.(Elect.) III year.
- 2. Rai Singh Jain Cash Prize of Rs. 3000/-for the girl student obtaining highest CGPA in B.Tech. (CSE/E&C/Electrical) III Yr.

#### Ankit Agarwal B.Tech. (CSE) IV year

Rai Singh Jain & Smt. Shakuntla Devi Jain Cash Prize of Rs. 3000/- for the student (Male or Female) obtaining highest CGPA in B.Tech.(CSE/E&C/Elect.) III Year.

#### Kushal Mukherjee B.Tech. (Mech.) IV year

Roy Memorial Cash Prize of Rs. 6000/- for obtaining highest CGPA up to III year Mech.Engg.

#### Chitwan Saluja B.Arch V Year(Discritinue from next yer)

Madan Gopal Agarwal Cash Prize of Rs. 1000/- for obtaining highest CGPA in Architectural Design in B.Arch IV Year.

#### Keerthi Raghavan B.Tech. (E & C) IV year

Swami Dial Sesquicentennial Award of books worth of Rs. 1000/- for the best student who wins 'The Thomason Quiz'.

#### Sidharth Gupta B.Tech. (Mech.) IV year

Cash Award of Rs. 1000/- for the best dressed student among Boys for the Session 2004-05

#### Ms. Aanchal Sharma B. Arch V Year

Cash Award of Rs. 1000/- for the best dressed among Girls for the Session 2004-05

#### Vipin Verma B.Tech. (Chem.) III year Best NCC Cadet for the session 2004-05

#### Deepak Verma M.Tech. (CSE) I Year

Maj. Sudhir Prakash Memorial Trophy and Cash Prize of Rs. 2000/- for outstanding performance in Cricket for the session 2004-05

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