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ADMITTED TO THE

**NATIONAL INSTITUTE OF TECHNOLOGY,
(DEEMED UNIVERSITY)
KURUKSHETRA**

**AGENDA
OF
SENATE**



**5th MEETING
TO BE HELD ON JANUARY 14th, 2006**

NATIONAL INSTITUTE OF TECHNOLOGY
(DEEMED UNIVERSITY)
KURUKSHETRA-136119

Agenda : 5th Meeting of Senate
Venue : Board Room, NIT, Kurukshetra
Date & Time : 14.01.2006 at 11:00 AM

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NATIONAL INSTITUTE OF TECHNOLOGY,
(DEEMED UNIVERSITY)
KURUKSHETRA-136119

No. R/5th Senate/ 266-96

Dated: 7/1/2006

1. Dr. M.N.Bandyopadhyay,
Director,
NIT, Kurukshetra.
2. Prof.C.V. Ramakrishnan,
Professor,
Department of Applied Mechanics,
Indian Institute of Technology,
New Delhi-110016.
3. Dr.Mrs.Renu Bhargava,
Professor,
Civil Engineering Department
Indian Institute of Technology,
Roorkee (UA).
4. Dr. M P Kapoor,
Y-8A, 1st Floor,
Hauz Khas,
New Delhi - 110 016
5. Prof. Sameresh Kar,
(Retired Professor, IIT Kanpur),
House No. 501,
IIT Campus,
Kanpur-208016 (UP).
6. Sh. Ravi Jadika,
President,
Indian Sugar & Gen. Engg. Corporation,
Yamuna Nagar, Haryana
7. Er. V K Sachdeva,
Executive Director,
The Saraswati Sugar Mills,
Yamuna Nagar-135001. (Haryana).

8. Prof. K R Sharma,
(Former Prof. & Head, EE, IIT Kanpur),
Vice-President, Samtel Colour Ltd.,
Ghaziabad (UP).
9. Shri V K Raizada,
(Former Member Rly. Board),
Managing Director, IRWO,
58, Rail Vihar, Sector 33,
NOIDA (UP).
10. Dr. A K Bhatnagar,
Petrotech Chair Professor,
Department of Chemical Engineering,
Indian Institute of Technology,
Hauz Khas,
New Delhi-110016.
11. Dr. Krishna Gopal,
Professor, Elect. Engg. Deptt.
and Dean (Planning & Development),
NIT, Kurukshetra.
12. Dr. R K Arora ,
Professor,
Electrical Engineering Department,
and Dean(Administration),
NIT, Kurukshetra.
13. Dr. R K Bansal,
Professor,
Civil Engineering Department
NIT, Kurukshetra.
14. Dr. T K Garg,
Professor, Mech. Engg.Deptt.,
and PTSW,
NIT, Kurukshetra.
15. Dr. M.K.Soni,
Professor,
Electrical Engineering Deptt.,
NIT, Kurukshetra

16. Dr. S P Jain,
Professor,
Electrical Engineering Department,
NIT, Kurukshetra.
17. Dr. V K Arora,
Professor,
Civil Engineering Department
NIT, Kurukshetra.
18. Dr. V K Sehgal,
Professor & Chairman,
Civil Engineering Department,
NIT, Kurukshetra.
19. Dr. S K Sharma,
Professor & Chairman,
Mechanical Engineering Department,
NIT, Kurukshetra.
20. Dr. K C Goyal,
Professor,
Mechanical Engineering Department,
NIT, Kurukshetra.
21. Dr. A K Gupta,
Professor,
Electronics & Communication Engg. Deptt.,
NIT, Kurukshetra.
22. Dr. K S Kasana,
Professor,
Mechanical Engineering Department,
& Dean(Academic),
NIT, Kurukshetra.
23. Dr. K B Singh,
Professor,
Humanities Department,
NIT, Kurukshetra.

24. Dr. A Swarup,
Professor & Chairman,
Electrical Engineering Department,
NIT, Kurukshetra.
 25. Dr. S K Chakarvarti,
Professor & Chairman,
Physics Department
and Chief Warden,
NIT, Kurukshetra.
 26. Dr. D V Singh,
Professor & Chairman,
Mathematics Department,
NIT, Kurukshetra.
 27. Dr. Rajender Kumar,
Asstt. Professor & Chairman,
Department of Humanities,
NIT, Kurukshetra
 28. Prof. Umesh Ghanekar,
Asstt. Professor & Chairman,
Electronics & Communication Engineering Department,
NIT, Kurukshetra.
 29. Dr. Dinesh Kumar,
Assistant Professor & Chairman,
Chemistry Department,
NIT, Kurukshetra.
 30. Prof. Mayank Dave,
Asstt. Professor & Chairman,
Computer Engineering Department,
NIT, Kurukshetra.
 31. Dr. Baldev Setia,
Asstt. Professor,
Civil Engineering Department,
& Officer Incharge (Academic Affairs),
NIT, Kurukshetra
- Special Invitee

Subject: 5th meeting of the Senate, National Institute of Technology, (Deemed University) Kurukshetra.

Sir,

This is in continuation of this office letter No.R/5th Senate/91-121 dated 3.1.2006 vide which it was intimated to you that the 5th meeting of the Senate, NIT Kurukshetra, will be held on **Saturday, the 14th January, 2006 at 11.00 AM in the Board Room of the Institute at Kurukshetra.**


The external Govt. and non-Govt. members of the Senate are entitled to sitting allowance of Rs. 1,000/- (Rupees one thousand only) per sitting in addition to TA/DA as per rules of the Institute.

We enclose herewith a copy of the Agenda for the said meeting for your kind perusal and reference. Kindly make it convenient to attend the meeting of the Senate on the above said date and time.

You are cordially invited to join us over lunch at about 1.30 PM in the Institute Guest House after the meeting is over.

Yours faithfully,

Encls: Agenda.


(RPS Lohchab)
Registrar & Member Secretary,
Senate NIT Kurukshetra

Item 5.1 To confirm the minutes of the 4th meeting of the Senate held on 5.02.2005.

The minutes of the 4th meeting of the Senate held on 5.02.2005 was circulated to all the members. The minutes are enclosed as **Appendix 1** from page 2 to 14.

NATIONAL INSTITUTE OF TECHNOLOGY,
KURUKSHETRA-136119

Minutes of 4th meeting of Senate of NIT, Kurukshetra held on 05.02.2005 at 11.00
AM in the Board Room of the Institute.

The following members were present:

1. Dr. S N Mahendra,
Director,
NIT, Kurukshetra.
 2. Dr. M P Kapoor,
'SHANTI NIKETAN'
H.No. 11, Salaria Vihar,
Army Welfare Housing Organisation,
Radio Station Road,
P.O. Punjabi University,
Patiala-147002 (Punjab).
 3. Dr. N P Mehta,
Professor,
Mechanical Engineering Department,
NIT, Kurukshetra.
 4. Dr. Krishna Gopal,
Professor, Elect. Engg. Deptt.
and Dean (Planning & Development),
NIT, Kurukshetra.
 5. Dr. R K Arora,
Professor,
Electrical Engineering Department,
NIT, Kurukshetra.
 6. Dr. T K Garg,
Professor,
Mech. Engg. Deptt.,
and P.T.S.W.,
NIT, Kurukshetra.
- Dr. S P Jain,
Professor & Chairman,
Electrical Engineering Department,
NIT, Kurukshetra.

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8. Dr. V K Arora,
Professor & Chairman,
Civil Engineering Department
& Chief Warden,
NIT, Kurukshetra.
9. Dr. V K Sehgal,
Professor,
Civil Engineering Department,
NIT, Kurukshetra.
10. Dr. S K Sharma,
Professor & Chairman,
Mechanical Engineering Department,
NIT, Kurukshetra.
11. Dr. K C Goyal,
Professor,
Mechanical Engineering Department,
NIT, Kurukshetra.
12. Dr. A K Gupta,
Professor,
Electronics & Communication Engg. Deptt.,
NIT, Kurukshetra.
13. Dr. K S Kasana,
Professor,
Mechanical Engineering Department,
NIT, Kurukshetra.
14. Dr. K B Singh,
Professor & Chairman,
Humanities Department,
NIT, Kurukshetra.
15. Dr. A Swarup,
Professor,
Electrical Engineering Department,
NIT, Kurukshetra.
16. Dr. S K Chakarvarti,
Professor,
Physics Department
and Dean (Academic),
NIT, Kurukshetra.
- RK

17. Dr. D V Singh,
Professor,
Mathematics Department,
& Controller of Examinations
NIT, Kurukshetra.
18. Dr. Dinesh Kumar,
Assistant Professor & Chairman,
Chemistry Department,
NIT, Kurukshetra.
19. Dr. V K Aggarwal,
Assistant Professor & Chairman,
Mathematics Department,
NIT, Kurukshetra.
20. Prof. Umesh Gharekar,
Asstt. Professor & Chairman,
Electronics & Comm. Engg. Deptt.,
NIT, Kurukshetra.
21. Prof. Mayank Dave,
Asstt. Professor & Chairman,
Computer Engineering Department,
NIT, Kurukshetra.
22. Dr. M.L. Mehta,
Asstt. Professor & Chairman,
Physics Department,
NIT, Kurukshetra.
23. Sh. R.P.S. Lohchab,
Member-Secretary

Er. Surya Kant, Vice President, Tata Consultancy Services, New Delhi telephonically expressed his inability to attend the meeting.

The following members also could not attend the meeting:-

1. Prof. Samresh Kar,
(Retired Professor, IIT Kanpur),
House No. 501,
IIT Campus,
Kanpur-208016 (UP).

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2. Er. V K Sochdeva,
Executive Director,
The Saraswati Sugar Mills,
Yamuna Nagar-135001. (Haryana).
3. Prof. K R Sharma,
(Former Prof. & Head, EE, IIT Kanpur),
Vice-President, Samtel Colour Ltd.,
Ghaziabad (UP).
4. Shri V K Raizada,
(Former Member Rly. Board),
Managing Director, IRWO,
58, Rail Vihar, Sector 33,
NOIDA (UP).
5. Dr. A K Bhatnagar,
Petrotech Chair Professor,
Department of Chemical Engineering,
Indian Institute of Technology,
Hauz Khas,
New Delhi-110016.
6. Prof. C. V. Ramakrishnan,
Professor,
Department of Applied Mechanics,
Indian Institute of Technology,
New Delhi-110016.
7. Prof. S. Gupta,
Principal,
Nemi Chand College of Engineering,
Israna,
Distt. Panipat (Haryana).
8. R K Bansal,
Professor,
Civil Engineering Department
NIT, Kurukshetra.

Before the agenda items were taken up for discussion, Sh. R.P.S. Lohchab, Registrar & Member Secretary of the Senate extended hearty welcome to the Director and Chairman of the Senate, Dr. M.P. Kapoor and the faculty members of the Institute.

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The Senate took the following decisions:-

- Item 4.1** To confirm minutes of the 3rd meeting of the Senate held on 28.5.2004.

The Minutes of the 3rd meeting of the Senate held on 26.5.2004, as circulated were confirmed.

- Item 4.2** To consider the action report on minutes of the 3rd meeting of the Senate held on 26.5.2004.

The Senate noted the action taken on minutes of the 3rd meeting of the Senate held on 26.5.2004 as per details furnished in the agenda item 4.2.

- Item 4.3** To consider report on registration for Ph.D.

The Senate noted that as on date of the meeting, 42 scholars were registered for Ph.D. and the fresh applications received in response to the Institute's recent advertisement are under examination in respective departments.

Out of 42 scholars registered, one has since left. The details are furnished in the Annexure-1 to the minutes. The Senate decided that the list be circulated to all the Departments.

The Senate also decided that when a scholar is registered for Ph.D., intimation of his/her registration be sent to the candidate, the department, the Supervisor and the Co-supervisor.

- Item 4.4** To consider review of ceiling on Professor, Asstt. Professor and Lecturer to Guide Ph.D. scholars imposed by the BOG.

The Senate resolved that to encourage and promote Ph.D. research, BOG may be requested to reconsider its earlier decision. The BOG may like to reconsider and leave the question of fixing the supervisors for a Ph.D. scholar on the DRC of the concerned department. However, the ceiling may be fixed on the maximum number of Ph.D. scholars which may be registered under the department at any given time on the lines of JI, Delhi with following formula.

Maximum number of Ph.D. scholars To be registered in a Department	=	Total number of regular faculty x 1.5
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The number of Ph.D. scholars so arrived at shall include both full time and part time.

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- Item 4.5** To consider allocation of Institute scholarships to each Department for Ph.D. Research.

The Senate noted that the BOG in its meeting held on 15.3.2003 had approved 25 (twenty five) scholarships for the Ph.D. students (16 for Engg. Departments and 9 for Applied Sciences and Humanities Departments). The Senate also noted that the allocation of scholarships to each department is to be made by the Director as per decision of the Board.

Within the above broad allocation, the Senate, therefore, desired that the department-wise allocation be made by the Director.

- Item 4.6** To note the revised fee structure for Ph.D. students under different categories.

The Senate noted that the BOG in its 6th meeting held on 30.9.2004 had approved the revised fee structure for Ph.D. scholars as recommended by a committee but had advised that the fee structure at IIT, Delhi may also be consulted.

The Senate decided that the same Committee under the Chairmanship of Dr. Krishna Gopal, which had earlier recommended the fee structure of Ph.D. scholars, may review the aforesaid matter and submit its report at the earliest possible. It was decided that report be placed before the Finance Committee in its next meeting.

- Item 4.7** To consider minor amendments in scheme for M.Tech. (Instrumentation) course of Physics Department.

The agenda item 4.7 regarding amendments proposed by Physics Department in the teaching scheme for M.Tech.(Instrumentation) was deferred. The Senate decided that the department may put up the proposal to Senate afresh with more detailed justification including operational difficulties faced.

- Item 4.8** To consider approval for students to be awarded degrees in the Convocation scheduled to be held on 19.3.2005.

The Senate recommended to the Board that the award of the degrees to B.Tech., B.E. and M.Tech. students as per details furnished in the agenda item 4.8 be approved. The lists containing the name of students to be awarded various degrees be authenticated by the Controller of Examination.

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The Senate observed that the various lists containing names of the students for awards of degrees should have been titled as 3 Semesters' B.Tech. Degree course, 6 Semesters' B.E. Degree Course and 4 Semesters' M.Tech. Degree course as the case may be.

In case some more candidates complete their degrees by 28.2.2005, the Senate authorized the Director to approve award of degrees to them also in the Convocation scheduled to be held on 19.3.2005 and the matter be reported to the Senate in its next meeting.

Item 4.9 To consider report on detailed criteria/procedure and weightage for admission in M.Tech.

The Senate approved the following detailed criteria/procedure and weightage for admission in M.Tech. during 2005 onwards on the basis of the recommendations made by Prof. S.P.Jain Committee. The selection criteria for M.Tech. admission shall be as under:-

i) Eligibility

A candidate should have at least 60% marks (or 6.67 CGPA on 10 point scale) in qualifying examination such as B.Sc.(Engg.)/B.E./B.Tech./ M.Sc. Degree Examination (50% marks or 5.56 CGPA for Scheduled Caste/Scheduled Tribes Candidates) on the basis of which the admission is being sought. For AMIE, the minimum requirement shall be 55% marks in degree.

The sponsored candidates also shall have minimum 60% marks (or 6.67 CGPA) in the qualifying degree examination (50% marks or 5.56 CGPA eligibility for SC/ST candidates). In addition, the sponsored candidate should have on the last date of applying, an experience of at least two years in the organization(s) of the types specified, out of which at least one year continuous experience should be as regular employee in the sponsoring organization.

The eligibility criteria is also given below in tabular form-

Category of Candidates	Eligibility Criteria
General	60% marks in qualifying degree examination or CGPA 6.67 on 10 point scale
SC/ST	50% marks in qualifying examination or CGPA 5.56 on 10 point scale
AMIE	55% marks in degree
Sponsored candidates	60% marks in qualifying degree examination or CGPA 6.67 on 10 point scale. (50% marks or CGPA 5.56 on 10 point scale, if belonging to SC/ST). On last date of applying, two years experience in the organization(s) of the types specified, out of which at least one year continuous experience should be as regular employee in the sponsoring organization.

ii) Basis for Selection

A merit list of the eligible candidates will be drawn on the basis of their valid GATE score only (i.e. 100% weightage to GATE score and no weightage to qualifying degree marks).

Seats will first be filled by GATE qualified candidates and the remaining vacant seats, if any, shall be offered to other candidates on the basis of their marks or CGPA in the qualifying examination. **Non-GATE candidates, however, shall not be eligible for any scholarship.**

The above mentioned revised eligibility conditions be suitably incorporated in the prospectus for 2005 onwards.

etc

- Item 4.10** To consider data on present strength of students, admissions in B.Tech. and M.Tech. during 2003 and 2004, dropouts and pass percentage analysis and suggestions for improvement in the system.

The senate observed that there are several inconsistencies in the data enclosed with the agenda item. The inconsistencies be looked into and the revised data be prepared. While preparing the revised data the following be taken in to consideration:-

- i) The pass %age of the results should be given semesterwise.
- ii) The yearwise data may be presented for the institute as a whole.
- iii) The data may also be prepared discipline wise and also graphically.
- iv) 1st year data may be presented semesterwise.
- v) Name of branches in the data should be presented in alphabetical order, clearly indicating the sanctioned intake, admissions made, dropouts, backlog, not cleared, passed out and pass %age etc.

Other Items

With the permission of the Chair, some other items were considered by the Senate and the following decisions were taken:-

1. ✓ The Senate noted observations made by the Board of Governors in its 6th meeting held on 30.9.2004 while considering minutes of the 3rd meeting of the Senate held on 26.5.2004 and observed that follow up actions as desired by the Board be taken at the earliest.

2. ✓ The Senate considered the point raised by Dr. S.K.Chakarvarti on the Senate agenda item 3.6 of its 3rd meeting held on 26.5.2004 and decided as under:-

- i) In case of a tie the aggregate score of the end-semester theory exams of 1st year in the subjects of Mathematics, Computer Engg. and physics shall be taken into account.
- ii) In case there is still a tie, first the marks obtained in end-semester theory exams of 1st year in the subject of Mathematics be considered followed sequentially by marks in Computer Engineering and finally in Physics in case it is required to break persisting ties.

This rule of tie breaking will be effective from year 2005 admissions onwards.

3. ✓ The Senate considered the observations made by Dr. M.K. Soni on the Senate agenda item 3.12(ii) of its 3rd meeting held on 26.5.2004 and decided that the

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decision already taken by the Senate under its said agenda item i.e. 3.12(11) stands which reads as under:-

"It should be mandatory for Ph.D. scholars to publish at least two papers in refereed national/international journals".

At the end of deliberations, the Director intimated the house that next meeting of the Senate will be held in near future. He will constitute some Committees to review examination system, reports/details relating to new courses and intake etc. so that they could be placed before the next Senate meeting.

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


(R.P.S. Lohchab)
Registrar & Member Secretary

Approved

Sd/-
(S.N. Mahendra)
Director & Chairman, Senate

NATIONAL INSTITUTE OF TECHNOLOGY - KURUKSHETRA
 Details of registered Ph.D students as on 05.02.2005

Sr. No.	Name SRS, M.S.	Part-time/Regular	Duplt.	Supervisor (NITK)	Co. Supervisor, if any	Regn. No. & date	Remarks
1.	Anam Aggarwal	Part-time	Mechanical	Dr. Han Bugh	-	No. 1019 dt. 3.9.04	Teacher
2.	Suresh Chaman	-00-	-00-	Dr. BK Sharma	Dr. RK Sengul, MIT, Hamirpur	No. 1020 dt. 3.9.04	Other
3.	Anish Kumar	-00-	-00-	Dr. BK Sharma	Dr. TP Singh, TIET, Patiala	No. 1021 dt. 9.9.04	Teacher
4.	Sanjeev Goel	-00-	-00-	Dr. KC Goyal	-	No. 1022 dt. 29.9.04	Other
5.	Rajeev Varna	-00-	-00-	Dr. NP Mehta	Dr. SS Rastan, NITK	No. 1023 dt. 14.9.04	NITK, Teacher
6.	Pravesh Kulkarni	-00-	-00-	Dr. VP Wani	Dr. Sujati Arora, NITK	No. 1024 dt. 16.9.04	Other
7.	Vijay Mittal	-00-	-00-	Dr. KS Kawasa	Dr. NS Thakur, NIT, Hamirpur	No. 1025 dt. 15.9.04	Teacher
8.	Vishal Gualti	-00-	-00-	Dr. Puneel Tandon	-	No. 1026 dt. 21.9.04	Teacher
9.	Parveen Kumar Saini	-00-	-00-	Dr. Puneel Tandon	Dr. PAM Rao, ITD	No. 1027 dt. 14.9.04	NITK, Teacher
10.	Sanjeev Kumar	-00-	-00-	Dr. VP Wani	Dr. TK Gang.	No. 1028 dt. 15.9.04	Teacher
11.	Sandeep Singh	-00-	-00-	Dr. BK Sharma	Dr. Puneel Tandon, NITK	No. 1029 dt. 14.9.04	NITK, Teacher
12.	Flameeth Kumar	-00-	-00-	Dr. KS Kawasa	Dr. Dinesh Khemraj, NITK	No. 1030 dt. 17.9.04	Teacher

Saini
- contd -

13.	Dh. Raj. Jathi	Part-time	Electrical	Dr. MK Soni	Dr. KS Sarathi, NITK	No. 1001 dt. 26.4.04	NITK, Teacher
14.	Anil Gupta	-do-	-do-	Dr. (Mrs.) Lilla Dewan	-	No. 1004 dt. 6.5.04	Teacher
15.	Jyoti Uhal	-do-	-do-	Dr. MK Soni	Dr. (Mrs.) Lilla Dewan, NITK	No. 1011 dt. 19.5.04	NITK, Teacher
16.	Rajeev Kumar	-do-	-do-	Dr. K. Gopal	-	No. 1012 dt. 2.5.04	Teacher
17.	Safwan	-do-	-do-	Dr. MK Soni	-	No. 1018 dt. 21.5.04	NITK, Teacher
18.	Saurabh Chandra	-do-	-do-	Dr. Anand Khandel	-	No. 1031 dt. 14.5.04	NITK, Teacher
19.	Rajesh Kumar Hooda	-do-	-do-	Dr. RK Arora	Dr. HK Sarbani, CSIC, Chandigarh	No. 1032 dt. 23.5.04	Teacher
20.	Yash Paul Singh	-do-	-do-	Dr. M.K. Soni	-	No. 1038 dt. 17.5.04	Teacher
21.	Sangeeta Lakshmi Pariza	-do-	-do-	Dr. A. Swarup	Dr. M. Harimandla, IITD	No. 1040 dt. 20.8.04	NITK, Other
22.	Yash Pal	-do-	-do-	Dr. A. Swarup	Dr. Bhan Singh, IITD	No. 1042 dt. 13.1.05	NITK, Teacher
23.	Mohan Lal	-do-	Civil	Dr. VK. Arora	Dr. SK Gupta, CSIR, Kanpur	No. 1005 dt. 30.4.04	Other
24.	Mohinder Singh	-do-	-do-	Dr. VK. Arora	Dr. Anupam Mittal, NITK	No. 1008 dt. 29.4.04	Other
25.	Gupta Sanjeev Kumar, Varinder	-do-	-do-	Dr. KK Singh	CSP Ojha, IIT Roorkee	No. 1017 dt. 9.7.04	Teacher
26.	Saravali Seta	-do-	-do-	Dr. VK. Sehgal	Dr. CVR Mummy, IIT Kanpur	No. 1041 dt. 6.1.05	NITK, Teacher
27.	Anv Sharma	Regular	Physics	Dr. J.K. Gaurava	-	No. 1002 dt. 23.3.04	Scholarship from DRDO Project, Other
28.	Prehishethi Turigal	-do-	-do-	Dr. J.K. Gaurava	-	No. 1003 dt. 29.3.04	Scholarship from IIT Kanpur Project, Other
29.	Moharaj Nain	Part-time	-do-	Dr. SK Chakravarti	-	No. 1006 dt. 22.4.04	Teacher

Review

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No.	Visiting	Part-time	Physics	Dr. SK Chakravart	No. 1006 dt. 7.4.04	Teacher
31.	Rajesh Kumar	-0-	-0-	Dr. SK Chakravart	No. 1010 dt. 5.4.04	Teacher
32.	Rishi Singh	-0-	-0-	Dr. J.K. Quamara	No. 1018 dt. 29.3.04	Teacher
33.	Amit Singh	-0-	Chemistry	Dr. Dinesh Kumar	No. 1013 dt. 4.6.04	Teacher
34.	Durjus Das	-0-	-0-	Dr. Dinesh Kumar	No. 1014 dt. 5.6.04	Teacher
35.	Ramesh Kumar	Regular	-0-	Dr. D.P. Singh	No. 1015 dt. 9.6.04	Scholarship Area (ISC Project) Other
36.	Rimpi Bhanu (In the Charge)	Part-time	-0-	Dr. D.P. Singh	No. 1035 dt. 18.10.04	Teacher
37.	Amit Mehta	-0-	Mathematics	Dr. D.V. Singh	No. 1007 dt. 18.3.04	Teacher
38.	Sandeep Singh	-0-	-0-	Dr. Jai Singh	No. 1033 dt. 30.3.04	Other
39.	Sudhar Kumar Gupta	-0-	-0-	Dr. Jai Singh	No. 1004 dt. 24.9.04	Teacher
40.	Rajesh Kumar	-0-	-0-	Dr. Kuldip Kumar	No. 1006 dt. 27.9.04	Teacher
41.	Abhishek Kumbhakar	-0-	E & CE	Dr. K.K. Gupta	No. 1037 dt. 8.10.04	Teacher
42.	Amrita Bani (In the Charge)	-0-	Comp. Engg.	Dr. Manoj Pradhan, MOU	No. 1008 dt. 31.10.04	Teacher

*Sh. Mohinder Singh, Regn. No. 1006 dt. 25.4.04 did not pay his fee for July/Aug, 2004 Semester. The Department has been requested to guide about cancellation of his registration.

Signature

Mechanical - 12
Electrical - 18
Chemistry - 4
Mathematics - 4
Comp. Engg - 1
E & CE - 1

- Item 5.2 To consider the Action Taken Report on the minutes of the 4th meeting of the Senate held on 5.02.2005.**

The Action Taken Report on the minutes of the last meeting is as under:

Item No.	Minutes	Action Taken
4.3	To consider report on registration for Ph.D.	Decision noted for compliance. An upto date list of candidates registered for Ph.D. is attached as Appendix II from page 17 to 22.
4.4	To consider review of ceiling on Professor, Asstt. Prof. and Lecturer to guide Ph.D. scholars imposed by the BOG.	Decision implemented.
4.5	To consider allocation of Institute scholarships to each Department for Ph.D. Research.	Decision noted for implementation.
4.6	To note the revised fee structure for Ph.D. students under different categories.	Matter under review by the Committee under the Chairmanship of Dr. Krishna Gopal, Professor, Electrical Engg. Dept. & Dean (P&D), NIT, Kurukshetra.
4.7	To consider minor amendments in Scheme for M.Tech.(Instrumentation) course of Physics Department.	The item had been withdrawn by the Chairman, Physics Deptt.
4.8	To consider approval for students to be awarded degrees in the Convocation to be held on 19.3.2005	Third para of the minutes of the item reads as under: 'In case some more candidates complete their degrees by 28.2.2005, the Senate authorized the Director to approve award of degrees to them also in the Convocation held on 19.3.2005 and the matter be reported to the Senate in its next meeting'

(In compliance of the same, the list provided by the Controller of Examination is placed before the Senate at **Appendix III Page 23**

- 4.9 To consider report on detailed criteria/ procedure and weightage for admission to M.Tech. Decision implemented
Accordingly it was incorporated in the prospectus of M.Tech. (2005-06) and admissions of session 2005-06 were done on the basis of this criteria/ procedure.
- 4.10 To consider data on present strength of students, admissions in B. Tech. and M.Tech. during 2003 and 2004, dropouts and pass percentage analysis and suggestions for improvement in the system. Revised data with present strength of the students admitted in B.Tech. & M.Tech. during 2003 and 2004, dropouts and pass percentage analysis etc. is put up in the present meeting at **Appendix from IV Page 24 to 38.**
- Other items:**
- 4.11
- (i) The Senate noted observations made By Board of Governors in its 6th meeting held on 30.9.2004 while minutes of the 3rd meeting of the Senate held on 26.5.2004 and observed that follow up actions as desired by the Board be taken at the earliest. Noted and various steps have been initiated.
- (ii) Regarding the breaking of the tie for change of branch (Ref: point raised by Dr. S K Chakarvarti) Noted and incorporated for the year-2005 admission onwards.
- (iii) Regarding publication of two research papers being mandatory for Ph.D. Scholars (Ref: point raised by Dr. M. K. Soni) Noted for compliance.

Appendix-II

NATIONAL INSTITUTE OF TECHNOLOGY – KURUKSHETRA
Details of registered Ph.D students as on 01.01.2006

Sr. No.	Name S/Sh./Ms.	Part-time/Regular	Deptt.	Supervisor (NITK)	Co. Supervisor, if any	Regn. No. & date	Remarks
1.	Dheeraj Joshi	Part-time	Electrical	Dr. MK Soni	Dr. KS Sandhu, NITK	No. 1001 dt. 25.4.04	NITK, Teacher
2.	Anu Sharma	Regular	Physics	Dr. JK Guamara	-	No. 1002 dt. 29.3.04	Scholarship from DRDO Project, Other
3.	Prabhavathi Turaga	Regular	Physics	Dr. JK Guamara	-	No. 1003 dt. 29.3.04	Scholarship from IITUP Project, Other
4.	Arun Gupta	Part-time	Electrical	Dr. (Mrs.) Lile Dewan	-	No. 1004 dt. 8.5.04	Teacher
5.	Mohan Lal	Part-time	Civil	Dr. VK Arora	Dr. SK Gupta, CSSRI, Karnal	No. 1005 dt. 30.4.04	Other
6.	Amit Manocha	Part-time	Mathematics	Dr. DV Singh	Dr. RK Tuleja, NCC, Israna (Panipat)	No. 1007 dt. 19.3.04	Teacher
7.	Manish Nain	Part-time	Physics	Dr. SK Chakravarti	-	No. 1008 dt. 22.4.04	Teacher
8.	Vijay Kumar	Part-time	Physics	Dr. SK Chakravarti	-	No. 1009 dt. 7.6.04	Teacher
9.	Rajesh Kumar	Part-time	Physics	Dr. SK Chakravarti	-	No. 1010 dt. 5.4.04	Teacher
10.	Jyoti Oberi	Part-time	Electrical	Dr. MK Soni	Dr. (Mrs.) Lile Dewan, NITK	No. 1011 dt. 19.5.04	NITK, Teacher
11.	Rajeev Kumar	Part-time	Electrical	Dr. K. Gopal	-	No. 1012 dt. 12.5.04	Teacher
12.	Amit Kumar	Part-time	Chemistry	Dr. Divesh Kumar	-	No. 1013 dt. 14.5.04	Teacher

13.	Durga Dees	Part-time	Chemistry	Dr. Dinesh Kumar	-	No. 1014 dt. 14.6.04	Teacher
14.	Ramesh Kumar	Regular	Chemistry	Dr. DP Singh	-	No. 1015 dt. 14.6.04	Scholarship from UGC Project, Other
15.	Randhir Singh	Part-time	Physics	Dr. JK Quamara	Dr. BK Kaushik NITK	No. 1016 dt. 20.3.04	Teacher
16.	Gupta Sanjeev Kumar Vasinder	Part-time	Civil	Dr. KK Singh	CSP Ojha, ET Rorkee	No. 1017 dt. 9.7.04	Teacher
17.	Sathans	Part-time	Electrical	Dr. MK Sami	-	No. 1018 dt. 21.5.04	NITK, Teacher
18.	Aman Aggarwal	Part-time	Mechanical	Dr. Hari Singh	-	No. 1019 dt. 3.6.04	Teacher
19.	Suresh Dhiman	Part-time	Mechanical	Dr. SK Sharma	Dr. RK Seligal, NIT, Hamirpur	No. 1020 dt. 9.8.04	Other
20.	Anish Kumar	Part-time	Mechanical	Dr. SK Sharma	Dr. TP Singh, TIET, Patnala	No. 1021 dt. 9.9.04	Teacher
21.	Sanjeev Goel	Part-time	Mechanical	Dr. KC Goyal	-	No. 1022 dt. 29.9.04	Other
22.	Rajeev Verma	Part-time	Mechanical	Dr. N.P. Mehta	Dr. S.S Rastan, NITK	No. 1023, dt. 14.9.04	Lecturer, NITK
23.	Pawan Kataria	Part-time	Mechanical	Dr. VP Wani	Dr. Surjit Avgris NITK	No. 1024 dt. 16.9.04	Other
24.	Vijay Mittal	Part-time	Mechanical	Dr. KS Karsane	Dr. NS Thakur NIT, Hamirpur	No. 1025 dt. 15.9.04	Teacher
25.	Vishal Guddi	Part-time	Mechanical	Dr. Puneet Tandon	-	No. 1026 dt. 21.9.04	Teacher
26.	Parveen Kumar Sami	Part-time	Mechanical	Dr. Puneet Tandon	Dr. PAM Rao, ITD	No. 1027 dt. 14.8.04	NITK, Teacher
27.	Sanjeev Kumar	Part-time	Mechanical	Dr. VP Wani	Dr. TK Garg, NITK	No. 1028 dt. 15.9.04	Teacher
28.	Sandeep Singhal	Part-time	Mechanical	Dr. SK Sharma	Dr. Puneet Tandon, NITK	No. 1029 dt. 14.9.04	NITK, Teacher

28.	Ramesh Kumar	Part-time	Mechanical	Dr. KS Kalsana	Dr. Dinesh Khanduja, NITK	No. 1030 dt. 17.9.04	Teacher
30.	Saurabh Chonana	Part-time	Electrical	Dr. Ashwani Kumar	-	No. 1031 dt. 14.9.04	NITK, Teacher
31.	Savitri Garg	Part-time	Mathematics	Dr. Jai Singh	-	No. 1033 dt. 20.9.04	Other
32.	Sudhir Kumar Gupta	Part-time	Mathematics	Dr. Jai Singh	-	No. 1034 dt. 24.9.04	Teacher
33.	Rimpi Mahari (nee Chopra)	Part-time	chemistry	Dr. D.P. Singh	-	No. 1035 dt. 14. 10.04	Teacher
34.	Rajesh Kumar	Part-time	Mathematics	Dr. Kuldeep Kumar	-	No. 1036 dt. 27.9.04	Teacher
35.	Alok Kr. Kuchwaha	Part-time	E & CE	Dr. A.K. Gupta	Dr. Manoj Pandey, MDU	No. 1037 dt. 8.10.04	Teacher
36.	Amrita Rani (nee Singh)	Part-time	Comp. Engg.	Dr. Mayank Dave	-	No. 1038 dt. 11. 10.04	Teacher
37.	Yash Paul Singh	Part-time	Electrical	Dr. M.K. Soni	-	No. 1039 dt. 17.5.04	Teacher
38.	Samranya Lakshmi Parra	Part-time	Electrical	Dr. A Swarup	Dr. M. Havramandu, IITD	No. 1040 dt. 20.8.04	NITK, Other
39.	Sarawati Sella	Part-time	Civil	Dr. VK Bhangal	Dr. CVR Murthy, IIT Kanpur	No. 1041 dt. 05.1.05	NITK, Teacher
40.	Yash Pal	Part-time	Electrical	Dr. A Swarup	Dr. Bhim Singh IITD	No. 1042 dt. 13.1.05	NITK, Teacher
41.	Sarjoo Kumar Aggarwal	Part-time	Electrical	Dr. Ashwani Kumar	Dr. L.M. Saini	No. 1043 dt. 21.2.05	Teacher
42.	Vijay Kumar Gupta	Part-time	Mathematics	Dr. Jai Singh	-	No. 1044 dt. 28.3.05	Teacher

43.	Mrs. Parvitha Mishra	Part-time	Civil	Dr. S.M. Gupta	Dr. Rajat Siddique	No. 1043 dt. 28.4.05	Lecturer, NITK
44.	Mr. Satish Kumar	Part-time	Physics	Dr. J.K. Guamara	Dr. M.L. Malta	No. 1046 dt. 3.5.05	Lecturer, Karnal
45.	Mrs. Mitu G Mehta	Part-time	Humanities	Dr. P.J. Philip	Dr. Rajender Kumar	No. 1047, dated 30.5.2005	Teacher
46.	Mrs. Bhawna Saini	Part-time	Humanities	Dr. P.J. Philip	Dr. R.K. Deepwal	No. 1048, Dated 30.5.2005	Teacher
47.	Vijay Kumar Bansal	Part-time	Civil	Mahesh Pal		No. 1049, dated 27.4.2005	Lecturer, Civil
48.	Anup Kumar	Part-time	Physics	Dr. S.K. Chakravarti	Dr. T.S. Kehwar, AP, Chandigarh	No. 1050, dated 16.8.2005	R SO
49.	Anil Kumar	Part-time	Physics	Dr. S.K. Chakravarti	-	No. 1051, dated 20.8.2005	Lecturer
50.	Geetika	Regular	Physics	Dr. J.K. Guamara		No. 1052, dated 6.7.2005	Non-teaching
51.	Pushkar Raj	Part-time	Physics	Dr. J.K. Guamara	Dr. S.K. Mahna	No. 1053, dated 14.7.05	Other
52.	U. Ghansar	Part-time	Computer	Dr. Rajco Panshey	Dr. A.K. Singh	No. 1054, dated 28.7.05	Lecturer, NITK
53.	Abhishek Swaroop Sharma	Part-time	Computer	Dr. A.K. Singh		No. 1055, dated 28.7.05	Lecturer, Delhi
54.	Archana Sharma	Part-time	Maths	-	-	No. 1056, dated 03.08.05	Lecturer, NITK
55.	Abhishek Gupta	Part-time	Humanities	Dr. P.J. Philip	-	No. 1057, dt. 29.7.05	Non-teaching
56.	Anil Kr Dahiya	Part-time	Electrical	Dr. Rajan Dahiya	-	No. 1058, dated 5.8.05	Lecturer, NITK
57.	Ms. Dehinder Kaur	Part-time	Electrical	Dr. Lillie Dewan	Prof. C.L. Mittal, P.T.T.S., Bhawan	No. 1059, dated 5.8.05	Lecturer, T.T.S., Bhawan
58.	Ms. Shaily Vadhwa	Part-time	Electrical	Dr. K.D. Sandhu	-	No. 1060, dated 5.8.05	Lecturer, NITK

58.	Dhanvir Mansal	Part-time	Mechanical	Dr.Pankaj Chandna	-	No. 1001, dt 19.8.05	Lecturer, TITS,Bhiwari
60.	Anand Kumar	Part-time	Electronics	Dr Rajoo Pandey,	-	No. 1062, dt 27.8.05	Lecturer,MITK
61.	Dibyendu Kr.Chaudhary	Part-time	Mechanical	Dr.S.K.Sharma	Mr B.G.Kamath	No. 1063, dt 31.8.05	Project engineering
62.	Sanjeev Kumar	Part-time	Mechanical	Dr.P.C.Tiwari,	-	No. 1064, dt 29.8.05	Lecturer,Ghazalbad
63.	Rohit Garg	Part-time	Mechanical	Dr.Hari Singh	-	No. 1065, dt 1.9.05	Lecturer,Jind
64.	Sahib sarda Singh	Part-time	Mechanical	Dr.K.Khanduja	Dr.V.P.Wari	No. 1066,dt 22.8.05	Lecturer,Gobindgarh, Punjab
65.	Rajv Khanduja	Part-time	Mechanical	Dr.P.C.Tiwari	-	No. 1067, dt 31.8.05	Lecturer,JMIT,Radour
66	Ranjeet Singh	Regular	Physics	Dr.S.K. Chakravarti	Dr.Sanjay Kumar Sharma, Methapur, Ambala	No. 1068,dt 1.10.2005	Lecturer,B.B.S.B Engg.College, Fatehgarh Sahib (Punjab)
67	Sanjeev Kumar	Regular	Maths	Dr.Jai Singh	-	No. 1069, Dt 4.10.2005	Non-teaching
68	Amit Goyal	Part-time	Maths	Dr.D V Singh	Dr.Golehan Lal Taneja, M.D.Uhl. Rohtak	No. 1070, Dt 6.10.05	Lecturer,Karnal
69	Rajeev Kumar	Part-time	Maths	Dr.D V Singh	Dr.Golehan Lal Taneja, M.D.Uhl. Rohtak	No. 1071, Dt 7.10.2005	Lecturer, N.C College of Engg.,Jaraha
70	Pawan Kumar	Regular	Maths	Dr.Jai Singh	-	No.1072 dt 10.10.05	Non-teaching
71	Ms Nidhi Sharma	Regular	Maths	Dr.Paras Ram	Dr.Rajneesh Kumar,K.U.K.	No. 1073, dt 10.10.05	Non-teaching
72	Vijay Kumar	Part-time	Maths	Dr.Kuldeep Kumar	-	No. 1074, dt 10.10.2005	Lecturer,Haryana College of Tech. & Mgt.,Kathal
73	Vandana Pandey	Part-time	Chemistry	Dr.Dinesh Kumar	-	No. 1075,dt 20.10.05	Lecturer,SKJET

74	Anju Gupta	Part-time	Chemistry	Dr.Dinesh Kumar	-	No. 1079, dt 20.10.2005	Non-Teaching
75	Vandna Majik	Part-time	Chemistry	Dr.D.P.Singh, Asstt Professor	-	No. 1077, dt 21.10.2005	Lecturer, SKIET
76	Vidhi Grover	Part-time	Chemistry	Dr.Kiran Jain, M.C.N College, Yamuna Nagar	Dr.D.P.Singh	No. 1078, dt 24.10.05	Lecturer, Yamuna Nagar
77	Meeliza Kamboj	Part-time	Chemistry	Dr.Kiran Jain, M.C.N College, Yamuna Nagar	Dr.D.P.Singh	No. 1079, dt 24.10.05	Lecturer, Yamuna Nagar
78	Mr Aman Gupta	Part-time	Civil	Dr.S.N.Sachdeva	-	No.1080, dated 2.11.2005	Teaching
79	Mrs.Yashu Rai	Part-time	Humanities	Dr.K.B.Singh	-	No. 1081, dt 9.11.2005	Lecturer, Hissar
80	Mr L.R. Aggarwal	Part-time	Humanities	Dr.Rajender Kumar	Dr.P.J.Phuip	No. 1082 dt 9.11.2005	Non-teaching

Discipline wise Ph.D. registration

Civil	:	06
Computer	:	03
Electrical	:	13
Electronics & Comm.	:	02
Mechanical	:	18
Chemistry	:	09
Physics	:	12
Maths	:	12
Humanities	:	05

Modewise Ph.D. registration

Regular/Full-time	:	08
Part-time	:	72



**NATIONAL INSTITUTE OF TECHNOLOGY
(Deemed University)
KURUKSHETRA**

No. Exam./2005/12/8

Dated: 30.12.2005

Please refer to your letter no. Acad' dated 30/12/2005, regarding Senate Item 4.8.

The following students got their degrees in the Convocation-2005, between 5th Feb. 2005 to 28 Feb. 2005 after approval of the senate:-

4 Year B.Tech. Degree Courses:

1.	95052	Monendra Kumar	EcE
2.	97226	Rajmresh Chander	Electrical
3.	2K113	Sarjny Singh Khatri	Mechanical
4.	2K147	Rakesh Kumar	Mechanical
5.	2K329	Megraj Upadhyay	Mechanical

4 Semester M.Tech. Degree Courses:

1.	2K2792	Santosh Kumar Gupta	EcE
2.	2K2763	Mahesh Kumar	Electrical (Power System)
3.	2K2765	Jatin Papneja	-do-
4.	2K2766	Naresh Kumar	-do-
5.	201765	Duli Chand Meena	-do-
6.	2K2751	Ashish Sharma	Electrical (Control System)

Further the following students of B.Tech. Degree Courses were approved in the senate, but their degrees could not be prepared as the students did not submit their old DMC's of Kurukshetra University, Kurukshetra to the Examination Cell.

1.	2K078	K. Arun Kumar	EcE
2.	99229	Sudesh Kumar	Electrical
3.	2K133	Mrida Moloy Mhohanty	Mechanical
4.	2K253	Bharat Bhushan Chandwari	Mechanical

This is for your information & further n.a. pls.

Prof. Incharge (Exam)
 For Controller of Examination

Dean(Academic)



NATIONAL INSTITUTE OF TECHNOLOGY
(Deemed University)
KURUKSHETRA

No. Exam./2005/ 12 / 9

Dated: 02.01.2006

Please refer to your letter No. Acad./ dated 30.12.2005 regarding the Senate Item 4.10.

Please find enclosed herewith the desired information.

slano

Dean (Academic)

slano
27/1/05

JVd
2/1/06
Controller of Examinations

NATIONAL INSTITUTE OF TECHNOLOGY, KURUKSHETRA
Admission Made During 2003

B.TECH 1st Semester

<i>Sr. No.</i>	<i>Total Appeared</i>	<i>Passed</i>	<i>Not Passed</i>	<i>Pass%age</i>
1	301	246	55	82%

B.TECH 2nd Semester

<i>Sr. No.</i>	<i>Total Appeared</i>	<i>Passed</i>	<i>Not Passed</i>	<i>Pass%age</i>
1	298	242	56	81%

B.TECH 3rd Semester

<i>Branch</i>	<i>Total Appeared</i>	<i>Passed</i>	<i>Not Passed</i>	<i>Pass%age</i>
Civil	47	37	10	79%
Computer	33	28	5	85%
Electrical	62	44	18	71%
Electronics & Comm.	70	54	16	77%
Mechanical	87	69	18	79%

Admission Made During 2004

B.TECH 1st Semester

<i>Sr. No.</i>	<i>Total Appeared</i>	<i>Passed</i>	<i>Not Passed</i>	<i>Pass%age</i>
1	303	233	70	77%

NATIONAL INSTITUTE OF TECHNOLOGY, KURUKSHETRA
Admission Made During 2003

M.TECH 1st Semester

<i>Branch</i>	<i>Total Appeared</i>	<i>Passed</i>	<i>Not Passed</i>	<i>Pass%age</i>
Civil	15	12	3	80%
Electrical	21	19	2	90%
Electronics & Comm.	14	14	-	100%
Instrumentation	15	14	1	93%
Mechanical	12	11	1	92%

M.TECH 2nd Semester

<i>Branch</i>	<i>Total Appeared</i>	<i>Passed</i>	<i>Not Passed</i>	<i>Pass%age</i>
Civil	11	9	2	82%
Electrical	21	18	3	86%
Electronics & Comm.	14	14	-	100%
Instrumentation	14	14	-	100%
Mechanical	11	8	3	73%

M.TECH 3rd Semester

<i>Branch</i>	<i>Total Appeared</i>	<i>Passed</i>	<i>Not Passed</i>	<i>Pass%age</i>
Civil	10	10	-	100%
Electrical	18	16	2	89%
Electronics & Comm.	14	13	1	93%
Instrumentation	10	7	3	70%
Mechanical	8	8	-	100%

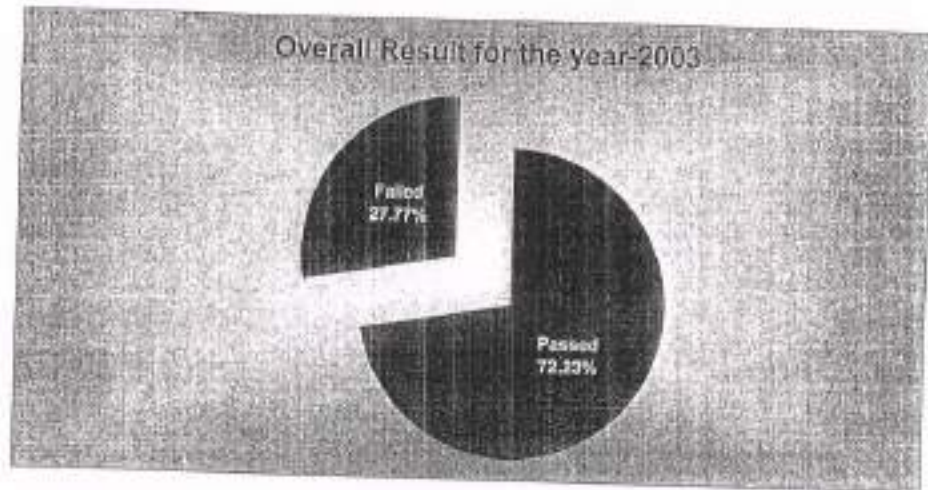
Admission Made During 2004

M.TECH 1st Semester

<i>Branch</i>	<i>Total Appeared</i>	<i>Passed</i>	<i>Not Passed</i>	<i>Pass%age</i>
Civil	17	12	5	71%
Electrical	20	19	1	85%
Electronics & Comm.	14	13	1	93%
Instrumentation	11	11	-	100%
Mechanical	10	8	2	80%

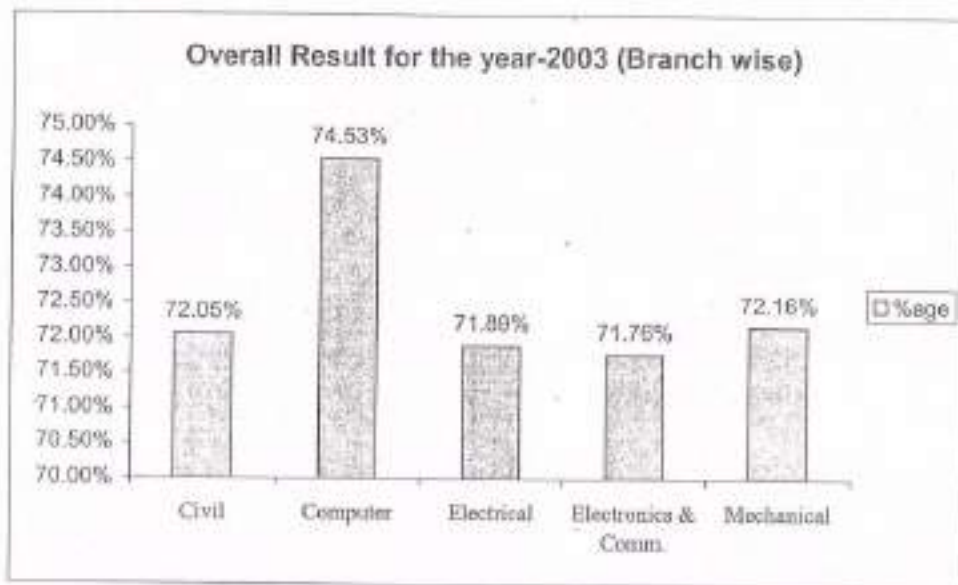
NATIONAL INSTITUTE OF TECHNOLOGY, KURUKSHETRA
YEARWISE DATA (YEAR-2003)

	Appeared	Passed	Failed
Students	2085	1506	579
Percentage	100%	72.23%	27.77%



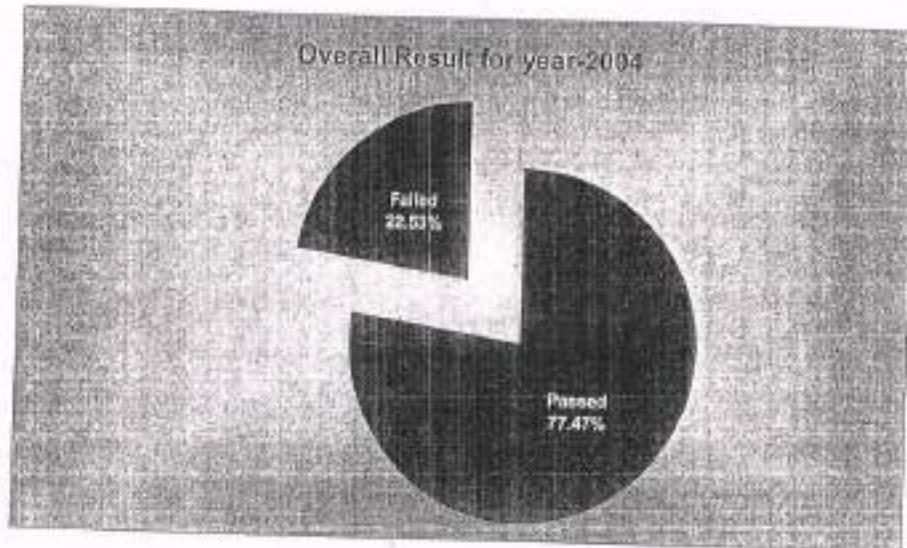
NATIONAL INSTITUTE OF TECHNOLOGY, KURUKSHETRA
Overall Result for the Year-2003

Discipline	Appeared	Passed	Failed	%age
Civil	322	232	90	72.05%
Computer	212	158	54	74.53%
Electrical	498	358	140	71.89%
Electronics & Comm.	471	338	133	71.76%
Mechanical	582	429	162	72.16%



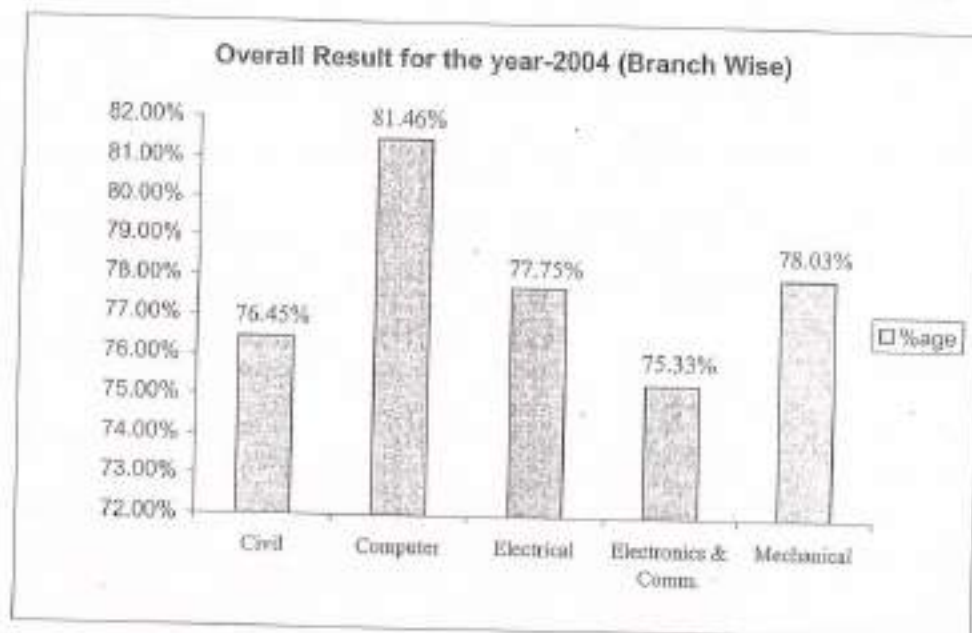
NATIONAL INSTITUTE OF TECHNOLOGY, KURUKSHETRA
YEARWISE DATA (YEAR-2004)

	Appeared	Passed	Failed
Percentage	1984	1537	447
Students	100%	77.46%	22.53%

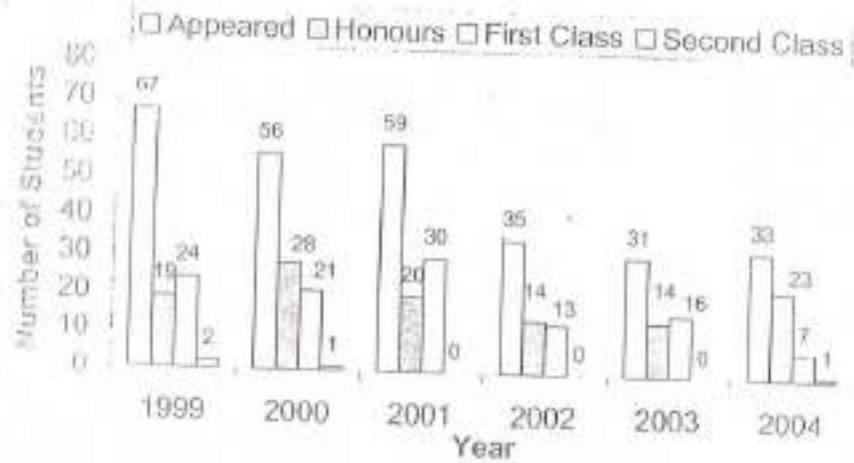


NATIONAL INSTITUTE OF TECHNOLOGY, KURUKSHETRA
Overall Result for the Year-2004

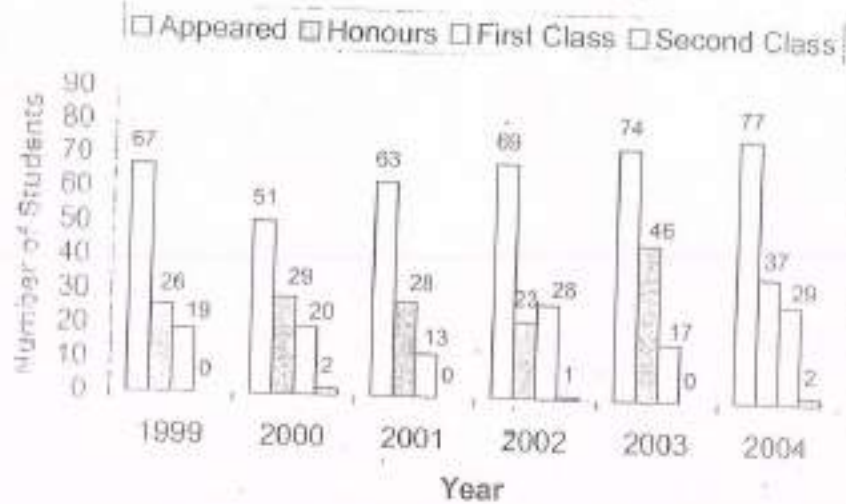
Discipline	Appeared	Passed	Failed	%age
Civil	310	237	73	76.45%
Computer	205	167	38	81.46%
Electrical	454	353	101	77.75%
Electronics & Comm.	446	336	110	75.33%
Mechanical	569	444	125	78.03%



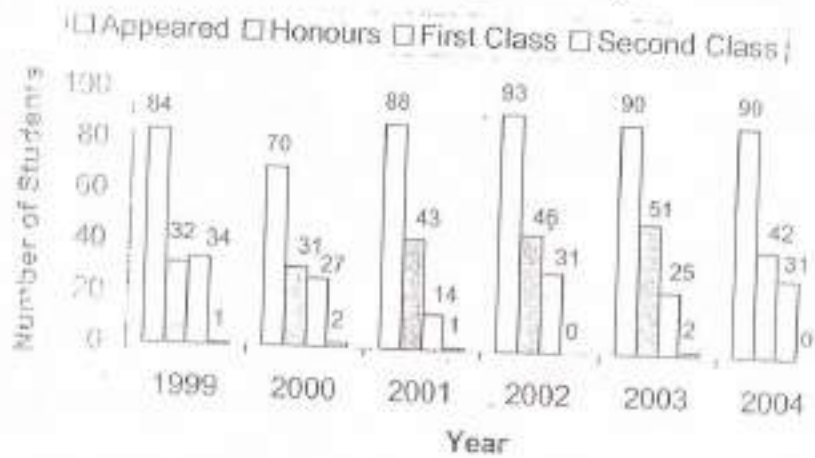
Computer Engineering



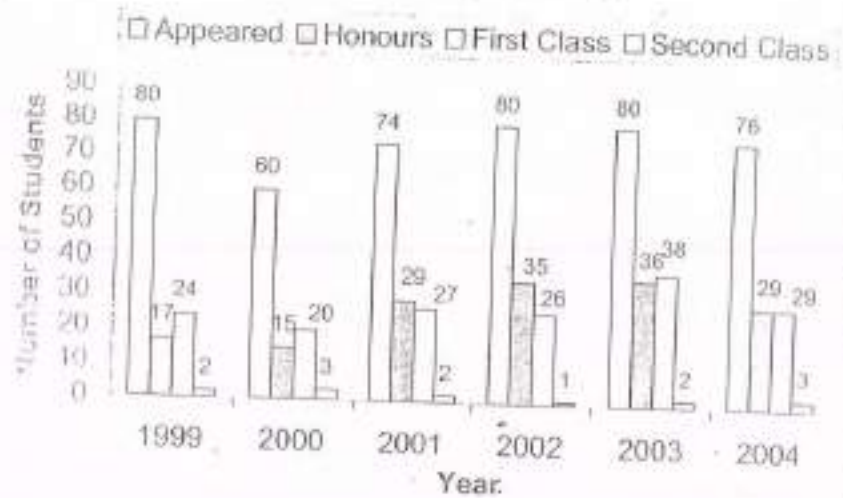
Electronics & Comm. Engg.

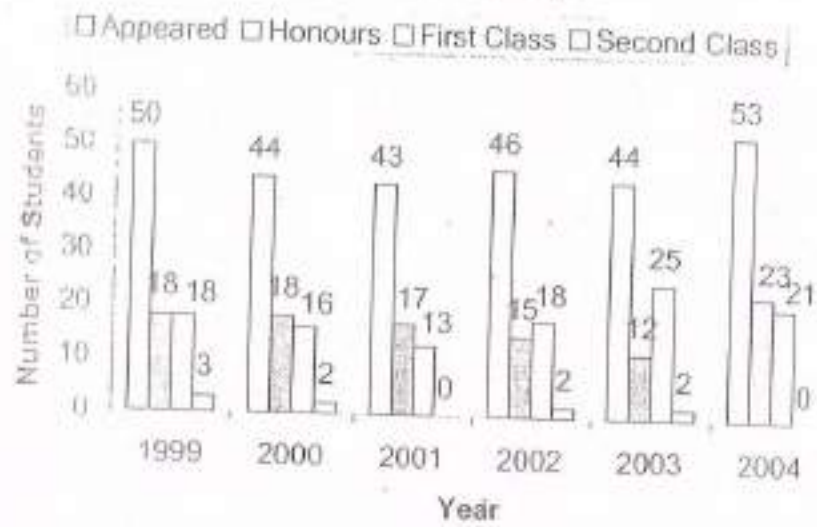


Mechanical Engineering



Electrical Engineering



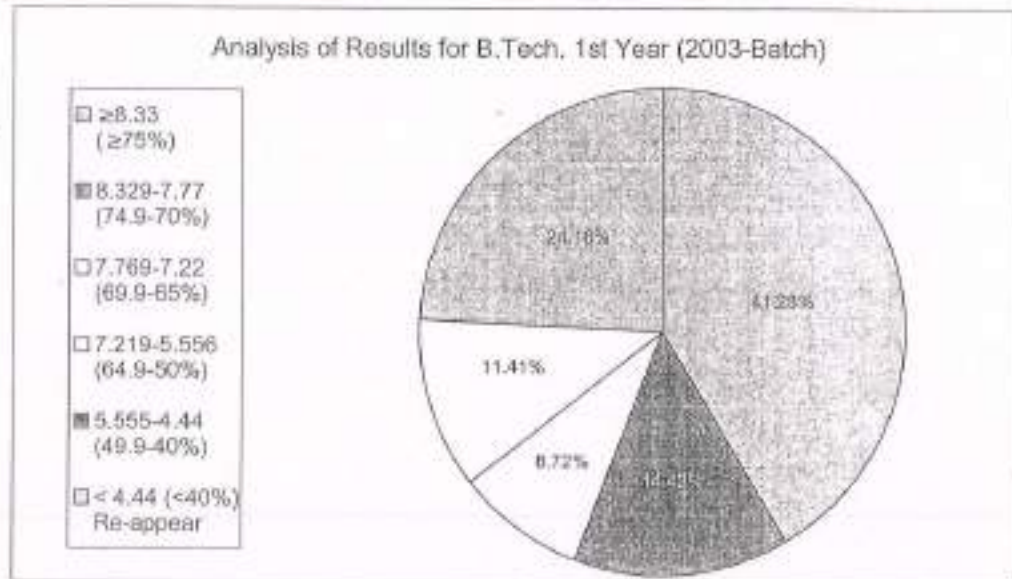
Civil Engineering

ANALYSIS OF RESULTS (GRADE SYSTEM SCHEME)

B.TECH. 1ST YEAR (2003-BATCH)

Examination May/June-2004

CGPA (%)		≥8.33 (≥75%)	8.329-7.77 (74.9-70%)	7.769-7.22 (69.9-65%)	7.219-5.556 (64.9-50%)	5.555-4.44 (49.9-40%)	<4.44 (<40%) Re-appear
Total No. of Students	298	123	43	26	34	-	72
%age	100	41.28%	14.43%	8.72%	11.41%	-	24.16%

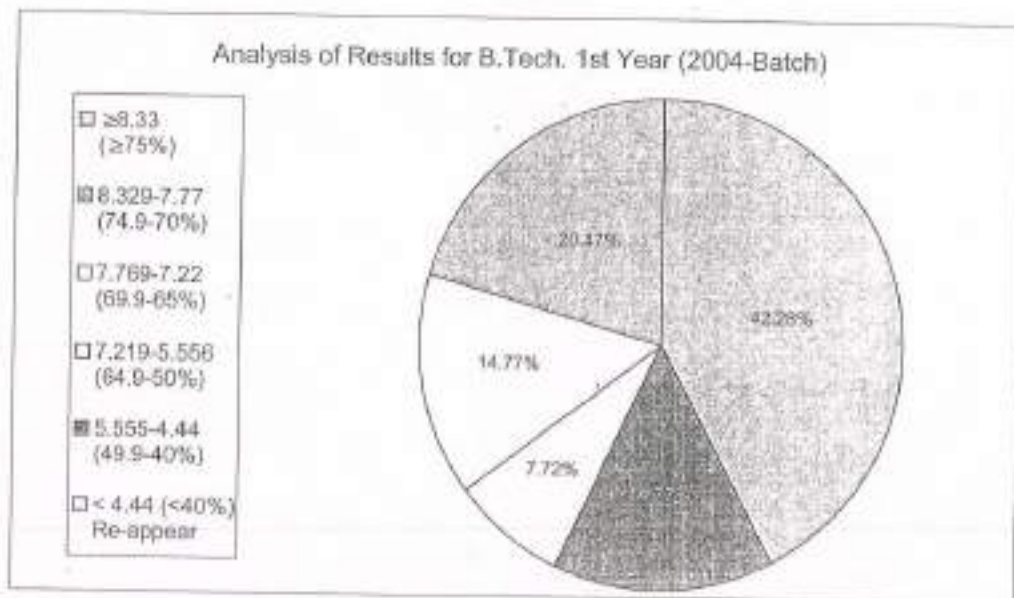


ANALYSIS OF RESULTS (GRADE SYSTEM SCHEME)

B.TECH. 1ST YEAR (2004-BATCH)

Examination May/June-2005

CGPA (%)		≥8.33 (≥75%)	8.329-7.77 (74.9-70%)	7.769-7.22 (69.9-65%)	7.219-5.556 (64.9-50%)	5.555-4.44 (49.9-40%)	< 4.44 (<40%) Re-appear
Total No. of Students	298	126	44	23	44	-	61
Yage	100	42.28%	14.77%	7.72%	14.77%	-	20.47%



NATIONAL INSTITUTE OF TECHNOLOGY, KURUKSHETRA
Students Admitted during 2001 & Passed out in 2005

B.Tech.

<i>Branch</i>	<i>Intake</i>	<i>Admitted</i>	<i>Left</i>	<i>Backlog of Prev. Years</i>	<i>Total</i>	<i>Appeared in Last Sem.</i>	<i>Not Cleared</i>	<i>Passed Out</i>	<i>Pass %age</i>
Civil	45	57	3	2	56	44	3	41	93.18
Computer	33	32	1	-	31	31	3	28	90.32
Electrical	75	72	5	1	68	72	5	67	93.06
Electronics & Comm.	66+1*	66+1*	1	3	68+1*	68	5	63	92.65
Mechanical	88	87	3	2	86	84	3	81	96.43
Total	327	314+1*	13	8	310	299	19	280	93.65

* - Foreign National

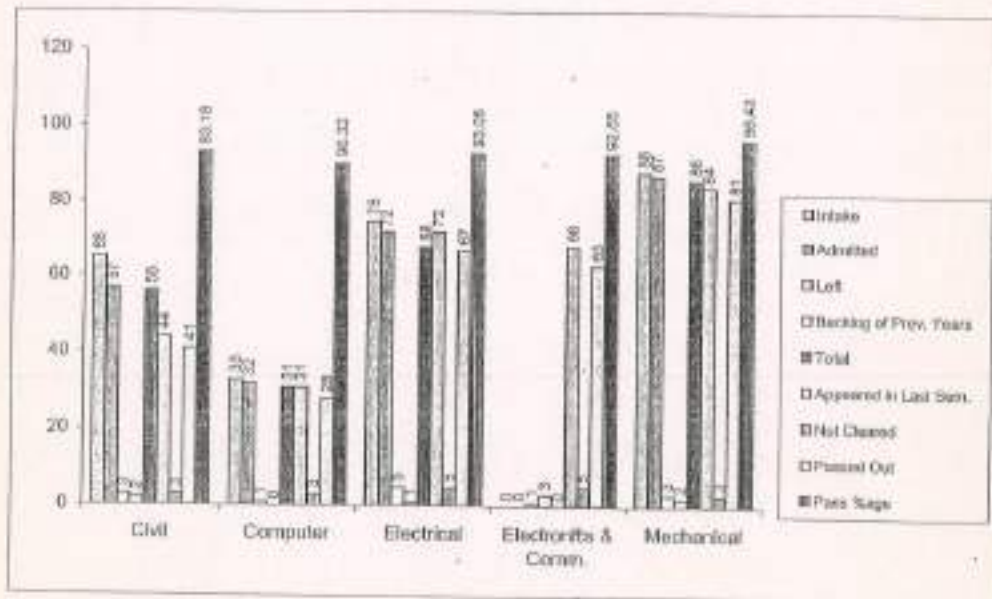
M.Tech.

<i>Branch</i>	<i>Intake</i>	<i>Admitted</i>	<i>Left</i>	<i>Backlog of Prev. Years</i>	<i>Total</i>	<i>Appeared in Last Sem.</i>	<i>Not Cleared</i>	<i>Passed Out</i>	<i>Pass %age</i>
Civil	45	17	2	-	15	10	-	10	100.00
Electrical	30	22	1	-	21	18	3	15	83.33
Electronics & Comm.	18	16	-	-	16	14	1	13	92.86
Instrumentation	18	16	-	-	16	10	3	7	70.00
Mechanical	15	12	-	-	12	8	-	8	100.00
Total	126	83	3	-	80	60	7	53	88.33

NATIONAL INSTITUTE OF TECHNOLOGY, KURUKSHETRA
Students Admitted during 2001 & Passed out in 2005

B.TECH.

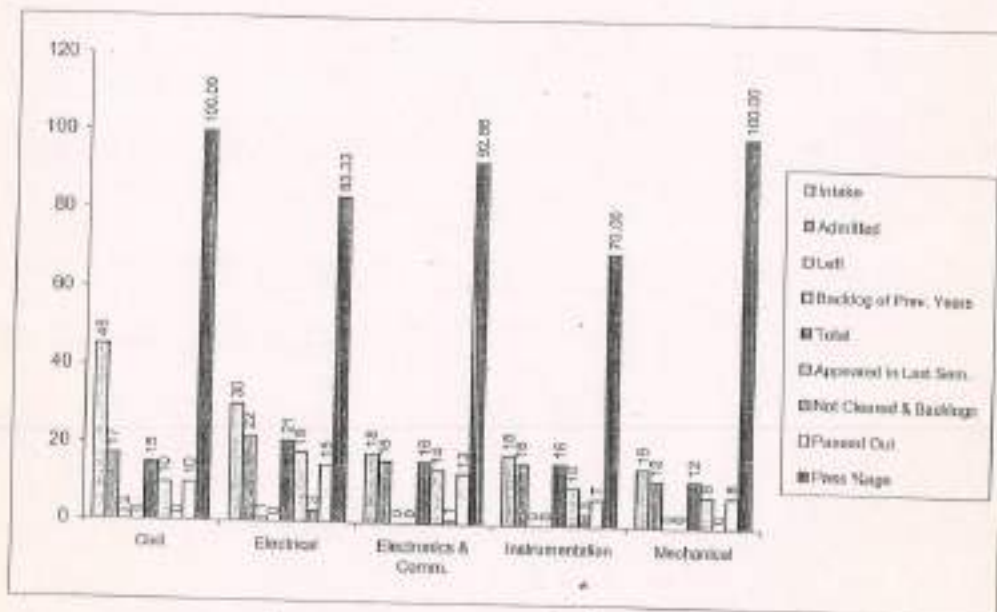
Branch	Intake	Admitted	Left	Backlog of Prev. Years	Total	Appeared in Last Sem.	Not Cleared	Passed Out	Pass %age
Civil	65	57	3	2	56	44	3	41	93.18
Computer	33	32	1	-	31	31	3	28	90.32
Electrical	75	72	5	1	68	72	5	67	93.06
Electronics & Comm.	66+1*	66+1*	1	3	68+1*	68	5	63	92.65
Mechanical	88	87	3	2	86	84	3	81	96.43
Total	327	314+1*	13	8	310	290	19	280	93.65



NATIONAL INSTITUTE OF TECHNOLOGY, KURUKSHETRA
Students Admitted during 2003 & Passed out in 2005

M.TECH.

Branch	Intake	Admitted	Left	Backlog of Prev. Years	Total	Appeared in Last Sem.	Not Cleared &	Passed Out	Pass %age
Civil	45	17	2	-	15	10	-	10	100.00
Electrical	30	22	1	-	21	18	3	15	83.33
Electronics & Comm.	18	16	-	-	16	14	1	13	92.86
Instrumentation	18	16	-	-	16	10	3	7	70.00
Mechanical	15	12	-	-	12	8	-	8	100.00




 Controller of Examination
 N.I.T., Kurukshetra
 (Deemed University)

Item No. 5.3 To consider modifications in the Grade Based Examination System (GBES).

Sr. No.	Existing	Proposed Modification
1.	If a student gets "E" Grade in a subject, he/she can improve the grade only by re-appearing in the end-semester examinations. His/her sessional marks will remain the same as was earned in the first attempt. He/she will require a total of 40 marks including sessional & new end semester exam. Marks, to pass.	<p>If a student gets 'E' Grade in a subject, he/she may be allowed to improve his/her grade, both in sessionals and end-semesters examinations. In sessionals, while there will be no change in the marks he/she has got for 'class work', he/she may be allowed to appear in the two tests/Viva-voce (20 marks each). Similarly for the subject of Practical /Seminar/Project, he/she will be allowed to improve upon his/her performance through teacher's evaluation during the semester. However, in such cases the maximum sessional marks be limited to 40%.</p> <p>This will be applicable to all old students of GBES, if their sessional marks are less than 40%.</p>
2.	If a student gets 40% of the total in sessionals, it is not necessary for him to appear in the end-semester examination.	<p>For a student to pass in a subject, a separate minimum of 40% has to be earned separately, both in sessionals and end-semester examination.</p> <p>This will be implemented with effect from the examinations commencing May, 2006.</p>
3.	A 5 point grading system with a 25-marks range (75-100) for the 'A'(Excellent) grade.	The grading system be changed from 5-points to 6-points with 'A' (Excellent) grade in the range of 75% to 84% and A+ (outstanding) in the range of 85% to 100%.

	Existing			Proposed Amended		
	Marks obtained	Grade	Category	Marks obtained	Grade	Category
1.	75 and above	A	Excellent	85 and above	A ⁺	Outstanding
2.	74 to 65	B	Good	84 to 75	A	Excellent
3.	64 to 50	C	Fair	74 to 65	B	Good
4.	49 to 40	D	Poor	64 to 50	C	Fair
5.	Less than 40	E	Fail	49 to 40	D	Poor
6.	-----			Less than 40	E	Fail

Senate may consider and approve it is to be implemented with effect from Session commencing July, 2006.

Item 5.4: To consider the starting of new M.Tech. courses in CAD/CAM, Transportation Engineering and Power Electronics and Drives under TEQIP.

Concise Institutional Proposal (CIP) of our Institute provides for the starting of the following Post-Graduate (M.Tech.) Programmes indicated below:

Department	Name of the Programme	Level	Proposed Annual Intake
Civil Engg.	Transportation Engineering	PG	20
Electrical Engg.	Power Electronics & Drives	PG	20
Computer Engg.	Computer Engg.	PG	20
Mechanical Engg.	CAD/CAM	PG	10

Consonant with the above, three departments, namely Mechanical Engineering, Civil Engineering and Electrical Engineering have submitted proposals to start M.Tech. Courses from session 2006-07. The details of the proposals as submitted by the departments have been appended in Appendix V, VI & VII from Page 42 to 56, 57 to 62 & 63 to 68 (M1, C1 and E1), respectively. The suggested annual intake (according to the Annexures) which varies from department to department as also from the CIP, may be limited to the proposed annual intake of CIP only. It may be brought to the notice of the Senate that Computer Engineering Department has not submitted any proposal for starting of an M. Tech. Course.

Name of the Programme	Department	Annexure
CAD/CAM	Mechanical Engg.	Annexure M1
Transportation Engg.	Civil Engg.	Annexure C1
Power Electronics & Drives	Electrical Engg.	Annexure E1

The Senate may consider and approve.

**DEPARTMENT OF MECHANICAL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY KURUKSHETRA**

**INTRODUCTION OF NEW COURSES:
M.TECH (MECHANICAL – CAD/CAM)**

1. Background

Design and manufacturing of components are two essential streams of Mechanical Engineering and product design and development. The gap between design and manufacturing need to be bridged, as product life cycle is getting shorter day by day. Acquiring knowledge of CAD/CAM prepares one to stand competitively in present era.

2. Justification

Due to globalization and opening up of the economy, competition has increased enormously in Indian manufacturing and service sector. A specialized course in M.Tech. (Mechanical – CAD/CAM) becomes important in view of the changing global scenario. Our engineers need to be equipped with latest technologies of product design, analysis, manufacturing and development. The courses in the stream of computer-aided design (CAD), computer-aided manufacturing (CAM), computer-aided engineering (CAE), computer-aided inspection (CAI) etc. are the need of the day for the budding Mechanical engineers. Every product is required to be given a final shape right from the concept, which exists in mind, to a reality in the shortest possible time and that too with minimum efforts and wastage. With more and more emphasis on R&D, postgraduate education in the area of CAD/CAM will prepare engineers with direct applications to industry as well as overall environment. The theory and lab courses would fulfill the need of providing students with practical knowledge in the area.

3. Proposed Sub-activities

- a. The proposed PG course will produce engineers with expertise in CAD/CAM. This will help the product design and development sector that is facing the specialized manpower crunch.
- b. The students will undertake practical problems faced by the industries in the product design and development sector and suggest remedies.
- c. The faculty will be utilizing their expertise and will provide solutions to the problems pertaining to the technologies of design, manufacturing and analysis of new and existing products.
- d. The students would strengthen the community, economy and hence, the country to stand tall in globally competitive environment.

4. Resource requirements**1.1 Civil Works**

1. The estimates for civil and electrical works are not included in the proposal.
2. Separate space and electrical connection will be required for these proposed equipments.

1.2 Equipments

Equipments for modernization are detailed in Annexure III.

1.3 Furniture

As per centralized purchase policy.

4.7 Human resources

4.7.1 Training: The teaching and supporting staff need training as detailed in Annexure III. Financial requirements are listed there.

4.7.2 Additional staff required: As detailed in Annexure-IV.

5. Financial requirements

The financial requirements of the course have been covered in Annexure III.

7. Impact: The proposed activity will be helpful in enhancing the much-needed expertise in the CAD/CAM sector. More thrust will be given on strengthening the country's knowledge and research base, as well as to uplift the industry to compete with global organizations.

8. Beneficiaries: All the students, faculty and the community will be benefited.

9. Preparedness: The institute has already identified the equipments to be procured.

10. Sustainability: Department proposes one Post Graduate course in CAD/CAM specialization (in addition to one existing). The intake of students will be 20 for the proposed course. The additional equipments and laboratories are proposed keeping in view the state of the art exposure to the students. The technological development will be keeping in mind the service to the community.

The revenue generation from the proposed missions will be as follows:

a) Fee @ Rs. 30,000 per student per annum for two year PG course:	Rs. 12,00,000.00
b) Revenue through facilities offered to the outside students performing dissertation/ project work:	Rs. 1,00,000.00
c) R & D Consultancy services:	Rs. 1,00,000.00
d) Revenue through short-term courses in emerging areas:	Rs. 1,00,000.00
Total Revenue:	Rs. 15,00,000.00

ENHANCEMENT IN POST GRADUATE EDUCATION AND RESEARCH.

1. Background:

For meeting the needs of the industries and large numbers of teachers required in engineering colleges, there is need for more number of engineers with post graduation and doctorate degrees.

2. Justification:

- a. With ever increasing number of Engineering Colleges there is a big demand of postgraduate engineers.
- b. Industries are also in search of specialized technical manpower.
- c. A lot of MNC's have setup their R&D centers & Indian ventures are also keen to go for in house R&D. There is a big demand for Doctoral and Postgraduate in emerging areas.

3. Sub activities:

In addition to existing Postgraduate course in Mechanical Engineering other postgraduate course is being introduced with intake of 20. Thus the total no of Postgraduate seats will be increased to 30. We may also introduce Part-time Post graduate courses to meet the needs of in service personnel.

EFFECTIVE INTERACTION WITH INDUSTRY

1. Background:

For overcoming the technical problems faced by the industries there is a need for providing consultancy to the industries by the experts in Engineering College. This will also expose our students and faculty to latest equipments in the industry.

2. Justification:

Industry is the end user of the product of engineering colleges. Both industry and institute need to have a meaningful interaction with each other on regular basis to sort out problems being faced by the industry.

3. Sub-activities:

- a. The faculty of the institute may use their expertise in solving the technical problems being faced by the industry.
- b. With increased interaction with industry, a better feed back of our product can be ascertained and accordingly remedial measures may be taken.

ADDITIONAL STAFF REQUIREMENT

Sr. no	Category of staff	Designation / Level	Gross Annual Emoluments (Rs. In Lacs)	No. to be added in different Project year					Total Staff to be added
				1	2	3	4	5	
		Technical Support Staff	(Sup) @ 01.50 (Audit) @ 00.60 (Network Admn.)@ 01.50		05 05 01				11
2	Admn. And Finance	Sr. Admn. Staff							
		Sr. Finance Staff							
		Sr. other Staff Support Staff	@ 01.25		01				01

Funds Required for Salaries of Additional staff Appointed under project

Sr. no.	Category of Staff	Annual Fund requirement of Salaries (Rs. in lacs)					Total Salary Funds reqt.
		1	2	3	4	5	
2	Technical Support Staff	-	12.00	12.00	12.00	12.00	048.00
3	Sr. Administration, Finance and other Staff.						
4	Non-technical support staff		01.25	01.25	01.25	01.25	005.00
	TOTAL						053.00

M.Tech. (Mechanical – CAD/CAM)

Name of the Program	Level (UG/PG)	Proposed Annual Intake	Proposed Year of Starting	Additional Teaching Staff Required
M.Tech(Mechanical CAD/CAM)	PG	20	2 nd Year	1 Professor, 2 Assistant Professor

Staff Requirement:

Sr. no	Category of staff	Designation / Level	Gross Annual Emoluments (Rs. In Lacs)	No. to be added in different Project year					Total Staff to be added
				1	2	3	4	5	
1	Academic	Professor	@ 03.60	-	01	-	-	-	01
		Assistant Professor	@ 02.70	-	02	-	-	-	02
		Lecturer	-	-	-	-	-	-	-
		Technical Support Staff	(Sup) @ 01.50 (Atdt) @ 00.60	-	01	-	-	-	02
2	Admn. And Finance	Sr. Admn. Staff	-	-	-	-	-	-	
		Sr. Finance Staff	-	-	-	-	-	-	
		Sr. other Staff	@ 01.25	-	01	-	-	-	01
		Support Staff	-	-	-	-	-	-	

Funds Required for Salaries of Additional staff Appointed under project

Sr. no.	Category of Staff	Annual Fund requirement of Salaries (Rs. in lacs)					Total Salary Funds reqt.
		1	2	3	4	5	
1	Teaching Staff	-	9.00	9.00	9.00	9.00	36.00
2	Technical Support Staff	-	2.10	2.10	2.10	2.10	08.40
3	Sr. Administration, Finance and other Staff.	-	-	-	-	-	-
4	Non-technical support staff	-	01.25	01.25	01.25	01.25	005.00
TOTAL							49.40

ANNEXURE V

SCHEME FOR NEW M.TECH. COURSE

Title: **M.Tech. (Mechanical – CAD/CAM)**

Subjects:	Theory Courses:	12
	Lab Courses:	06
	Seminars:	03
	Project:	03
	Dissertation:	01

List of theory Courses:

- Computer Aided Design
- Computer Aided Manufacturing
- Finite Element Method
- Optimization Techniques
- Product Design and Development
- Advanced Machine Design
- Advance Manufacturing Technology
- Numerical Analysis and Computer Programming
- Computer Integrated Manufacturing Systems
- Robotics
- Machining Science
- Machine Tool Design
- Tool Design
- Advance Metrology
- Modeling and Simulation
- Soft Computing
- Mechatronics
- Instrumentation

Note: The students will be offered twelve theory courses out of the courses mentioned above.

List of Lab Courses:

- Computer Aided Design Lab
- Computer Programming Lab
- Computer Numerical Control Lab
- Product Design and Development Lab
- Advance Production Lab
- Robotics and Machine Vision Lab
- Mechatronics Lab.
- CIMS Lab

Justification for the Proposed Labs/ Centers of Excellence and Equipments

The equipments are proposed with the intention for the following proposed courses as well as centers of excellence as follows:

- 1) B.Tech. in Mechanical Engineering with specialization in CAD/CAM
- 2) M.Tech. in Manufacturing Technology
- 3) M.Tech. in CAD/CAM

2. In addition to imparting engineering education, these labs will act as common platform for effective industry-institute interaction helpful for

- a. Students in bringing awareness about real industrial problems and
- b. Industries in getting advantage of research and infrastructure facilities.

3. The equipments are proposed taking into consideration the changes incorporated and additions made in the recently revised syllabus. Further, new labs in the area of CAD/CAM are introduced both in B.Tech. and M.Tech. curricula.

4. To conduct short-term skill development courses for unemployed youths in community for encouraging them for self-employment.

5. Machines and equipment will state-of-the-art technologies can be useful for conducting industrial research for the surrounding industries.

6. These facilities with subsequent project and research work can provide consultancy to small scale industries in clusters like Machine tools at Ludhiana, Foundary at Samalkha, Scientific Instruments at Ambala, Utensil industry at Jagadhari etc. in removing obsolescence for their sustainable development and growth.

3.1.1. Improvement in Teaching, Training and Learning Facilities:

- a) The proposed laboratories and modernization to the workshop will be helpful in developing a platform for practical exposure to the UG students, project work to the PG students and research to the research scholars. The awareness of the students with modern equipments with the state of the art technology can be useful to enhance their competency and employability in the national as well as international market.
- b) The proposed new M Tech programs are in the emerging areas with the aim to expose the post graduate students to specializations that are going to form the backbone of the technology in the times to come. The courses are designed to encourage self-employment.

Name of the Program	Level (UG/PG)	Proposed Annual Intake	Proposed Year of Starting	Additional Teaching Staff Required
M.Tech CAD/CAM	PG	20	2 nd Year	1 Professor, 2 Assistant Professors

9. Sustainability Plan

DEPARTMENT PROPOSES FIVE POST-GRADUATE COURSES WITH AN INTAKE OF 20 STUDENTS IN EACH PROGRAM, THE ADDITIONAL EQUIPMENTS AND LABORATORIES ARE PROPOSED KEEPING IN VIEW PROVIDING PRACTICAL AND STATE-OF-ART EXPOSURE TO THE STUDENTS. THE PROJECTS AND R&D WILL BE INDUSTRY-ORIENTED/NEED-BASED AND WILL HAVE THE BILATERAL BENEFITS AT BOTH THE ENDS. THE TECHNOLOGY DEVELOPMENT WILL BE KEEPING IN MIND THE SERVICE TO COMMUNITY.

The revenue generation from the proposed missions will be as follows:

1. Fee @ Rs. 30,000/- per student per annum for two-year Post graduate courses
Intake: 20 students per course per annum
40 students per course (Total: 200 students) = Rs. 6,000,000/-
2. Fee @ Rs. 30,000/- per student per annum for three-year Doctoral programs
Intake: 10 students per annum
30 students = Rs. 900,000/-
3. Revenue through facilities offered to the outside students performing dissertation/project works = Rs. 100,000/-
4. R&D and Consultancy services = Rs. 500,000/-
5. Revenue through offering short-term courses in specialized/emerging areas to industries = Rs. 200,000/-

Total Revenue = Rs. 77,000,000/- (Rs. 77 Lacs)

ANNEXURE-1

NEW COURSE TO BE STARTED

Name of the Course:	M. Tech. CAD/CAM
Starting Year:	Semester I, 2005-06
Total Intake of Students:	25 (15 seats for regular students through GATE + 10 seats for in-service / part-time candidates. The seats of both categories are interchangeable.) The candidates will be allowed to join the M.Tech. at different points of time at the start of each semester.
Qualifications for M.Tech.:	B.Tech. in Mechanical/ Production/ Industrial Engineering / Computer Science and Engineering
Proposed Fee Structure:	Same as for the other M.Tech Courses presently running in the Institute.
Duration of the P.G. Course:	Multi-level entry is proposed with 2 Years duration for regular students and maximum of 5 years duration for the students joining the M.Tech. at different points of time. The students will be allowed to join the M. Tech. at the start of each semester. The students shall be free to select any number of courses in a semester subject to the condition that the duration of M.Tech. shall be minimum 2 years and maximum of 5 years.

SCHEME FOR NEW M.TECH. COURSE

Title: M.Tech. (Mechanical – CAD/CAM)

Subjects:

Theory Courses:	12
Lab Courses:	06
Seminars:	03
Project:	03
Dissertation:	01

List of theory Courses:

Computer Aided Design
 Computer Aided Manufacturing
 Finite Element Method
 Optimization Techniques
 Product Design and Development
 Advanced Machine Design
 Advance Manufacturing Technology
 Numerical Analysis and Computer Programming
 Computer Integrated Manufacturing Systems
 Robotics
 Machining Science
 Machine Tool Design
 Tool Design
 Advance Metrology
 Modeling and Simulation
 Soft Computing
 Mechatronics

Note: The students will be offered twelve theory courses out of the courses mentioned above.

List of Lab Courses:

Computer Aided Design Lab
 Computer Programming Lab
 Computer Numerical Control Lab
 Product Design and Development Lab
 Advance Production Lab
 Robotics and Machine Vision Lab
 Mechatronics Lab
 CIMS Lab

Project Courses:

One in each semester

Dissertation

In Fourth Semester

- **Flexibility of Timings and Selection of Subjects**

The proposed P. G. Programme is made highly flexible in the choice of subjects and timings of attending the classes to facilitate their pursuit by in-service personnel. The classes for in-service persons can be conducted on Saturdays / Sundays / holidays, or in the evening hours as per the feasibility and convenience of the faculty and students.

- **Existing Faculty**

1. Dr. T.K. Garg, Professor
Ph.D.
2. Dr. Puneet Tandon, Assistant Professor
Ph.D. (CAD), M.Tech. (CAM)
3. Dr. Ajai Jain, Lecturer
Ph.D. (CAM), M.Tech. (CAM)
4. Sh. Parveen Kumar Saini
Pursuing Ph.D. in CAD

- Highly qualified faculty is available from other specializations of Mechanical Engineering / other disciplines to teach subjects of interdisciplinary nature.

- **Additional Load**

56 hours per week for both years of M. Tech. (@ 28 periods per week per semester)

Additional Staff Requirement

1-Professor (12 hours) + 2- Assistant Professors (14 hours each) + 1 Lecturer (16 hours each) +
1-Lab Tech. + 1 Lab Attendant / Peon

Staff Designation	Gross Annual Emoluments (Rs.)	Numbers to be added in years		Total Staff to be added
		2005-06	2006-07	
Professor	3,60,000/-	1	-	1
Assistant Professor	3,00,000/-	1	1	2
Lecturer	2,40,000/-	-	1	1
Lab Technician	96,000/-	1	-	1
Lab Attendant	72,000/-	1	-	1
Total				6

1. SUSTAINABILITY OF THE COURSE

Same fee structure as being followed for the other M.Tech courses presently running in the Institute is proposed to be followed. However, after funding from the TEQIP project is over and the proposed M.Tech Course is not given funds from any other source, a fee of Rs 15000/- per semester (Rs. 2500/- p.m.) may be charged from the students. In that case the funds position will be:

- Total funds generated through fee per month:
 2500×50 (25 first yr + 25 second yr students) = 125,000/-
- Total funds needed to meet the salary requirement of the above staff per month:
 1- Professor (30,000) + 2-Asst Prof (25,000 x 2) + 1 Lectuer (20000) 1-Lab Tech (8000)
 + 1 Lab Attendant / Peon (6000) = 1,14,000/-
- As multi-level and multi-back-background entry has been proposed with full flexibility in the timings and selection of the subjects, it is believed that the programme will be able to attract a large number of students including the in-service personnel.
- From the above, it is hoped that the proposed P.G. programme will be able to sustain even after the funding from the project is over.

JUSTIFICATION AND NEED FOR STARTING M.TECH COURSE IN CAD/CAM

1. Background

Design and manufacturing of components are two essential streams of Mechanical Engineering and product design and development. The gap between design and manufacturing needs to be bridged, as product life cycle is getting shorter day by day. Acquiring knowledge of CAD/CAM prepares one to stand competitively in present era.

2. Justification

Due to globalization and opening up of the economy, competition has increased enormously in Indian manufacturing and service sector. A specialized course in M.Tech. (Mechanical – CAD/CAM) becomes important in view of the changing global scenario. Our engineers need to be equipped with latest technologies of product design, analysis, manufacturing and development. The courses in the stream of computer-aided design (CAD), computer-aided manufacturing (CAM), computer-aided engineering (CAE), computer-aided inspection (CAI) etc. are the need of the day for the budding Mechanical engineers. Every product is required to be given a final shape right from the concept, which exists in mind, to a reality in the shortest possible time and that too with minimum

...arts and wastage. With more and more emphasis on R&D, postgraduate education in the area of CAD/CAM will prepare engineers with direct applications to industry as well as overall environment. The theory and lab courses would fulfill the need of providing students with practical knowledge in the area.

3. Impact:

The proposed activity will be helpful in enhancing the much-needed expertise in the CAD/CAM sector. More thrust will be given on strengthening the country's knowledge and research base, as well as to uplift the industry to compete with global organizations. All the students, faculty and the community will be benefited. The impact of the proposed course can be realized as:

- (i). The proposed PG course will produce engineers with expertise in CAD/ CAM. This will help the product design and development sector that is facing the specialized manpower crunch.
- (ii). The students will undertake practical problems faced by the industries in the product design and development sector and suggest remedies.
- (iii). The faculty will be utilizing their expertise and will provide solutions to the problems pertaining to the technologies of design, manufacturing and analysis of new and existing products.
- (iv). The students would strengthen the community, economy and hence, the country to stand tall in globally competitive environment.

5. Enhancement in Post Graduate Education and Research

- a. With ever increasing number of Engineering Colleges there is a big demand of postgraduate engineers.
- b. Industries are also in search of specialized technical manpower.
- c. A lot of MNC's have setup their R&D centers & Indian ventures are also keen to go for in house R&D. There is a big demand for Doctoral and Postgraduate in emerging areas.

EFFECTIVE INTERACTION WITH INDUSTRY

For overcoming the technical problems faced by the industries there is a need for providing consultancy to the industries by the experts in technical institutes. This will also expose our students and faculty to latest equipments in the industry. As Industry is the end user of the product of engineering colleges, both industry and institute need to have a meaningful interaction with each other on regular basis to sort out problems being faced by the industry. Different planned sub-activities are:

1. The faculty of the institute may use their expertise in solving the technical problems being faced by the industry. With increased interaction with industry, a better feed back of our product can be ascertained and accordingly remedial measures may be taken.
2. In addition to imparting engineering education, these lifts will act as common platform for effective industry-institute interaction helpful for
 - a. Students in bringing awareness about real industrial problems and
 - b. Industries in getting advantage of research and infrastructure facilities.

3. The equipments are proposed taking into consideration the changes incorporated and additions made in the recently revised syllabus. Further, new labs in the area of CAD/CAM are introduced both in B.Tech. and M.Tech. curricula.
4. To conduct short-term skill development courses for unemployed youths in community for encouraging them for self-employment.
5. Machines and equipment with state-of-the-art technologies can be useful for conducting industrial research for the surrounding industries.
6. These facilities with subsequent project and research work can provide consultancy to small scale industries in clusters like Machine tools at Ludhiana, Foundry at Samalkha, Scientific Instruments at Ambala, Utensil industry at Jagadhari etc. in removing obsolescence for their sustainable development and growth.

EXISTING INFRASTRUCTURE AND PHYSICAL FACILITIES

1. **CAD Labs** – In the process of development under TEQIP.
2. **CAM Lab** - In the process of development as Equipment Shop of Workshop Extension under TEQIP.
3. **Mechatronics Lab** – Setup in the department.
4. **Machine Vision and Image Processing Lab** – Existing in the department.
5. **Advance Production Lab** – Under development.
6. **Computer and Automation Center** – Existing in the department.

ANNEXURE-1

NEW COURSE TO BE STARTED

- Name of the Course: **M.Tech. in Transportation Engineering**
- Starting Year: **July 2006**
- Total Intake of Students: **20** (10 seats for regular students through GATE + 10 seats for in-service / part-time candidates. The seats of both categories are interchangeable.) The candidates will be allowed to join the M.Tech. at different points of time at the start of each semester.
- Qualifications for M.Tech.: **Multi-background entry** is proposed with B.Tech.in Civil / Architecture / related disciplines of Civil Engg. such as B.Tech. in Structures / Building Const./ Town Planning / Civil Road Transport, etc.; or equivalent. Candidates with background of M.Sc. Geology / Geography and working in transportation related departments shall also be eligible.
- Proposed Fee Structure: Same as for the other M.Tech Courses presently running in the Institute.
- Duration of the P.G. Course: **Multi-level entry** is proposed with 2 Years duration for regular students and maximum of 5 years duration for the students joining the M.Tech. at different points of time. The students will be allowed to join the M.Tech. at the start of each semester. The students shall be free to select any number of courses in a semester subject to the condition that the duration of M.Tech. shall be minimum 2 years and maximum of 5 years.

- **Proposed Course Curriculum**

- I-Semester

1. Traffic Engineering and Management
2. Pavement Design
3. Pavement Materials
4. Statistics and Operations Research
5. Traffic Lab

- II-Semester

1. Bridge Design and Construction
2. Pavement Construction, Maintenance and Management
3. Urban Transportation Planning
4. Elective-1
 - (i) Ground Improvement Techniques
 - (ii) Finite Element Analysis of Structures
 - (iii) Low Cost Roads
 - (iv) Advanced Engineering Geology
 - (v) Project Management
5. Pavement and Materials Lab

- III-Semester

1. Transportation Economics and Project Appraisal
2. Public Transportation Systems
3. Land use and Regional Transportation Planning
4. Elective-II
 - (i) Concrete Technology and Prefabrication
 - (ii) Hydrology and Urban Drainage
 - (iii) Aerial Photogrammetry and Remote Sensing
 - (iv) Hill Roads
 - (v) Tunneling Technology
5. Computation Lab

- IV-Semester

Dissertation

- **Flexibility of Timings and Selection of Subjects**

The proposed P.G. Programme is made highly flexible in the choice of subjects and timings of attending the classes to facilitate their pursuit by in-service personnel. The classes for in-service persons can be conducted on Saturdays / Sundays / holidays, or in the evening hours as per the feasibility and convenience of the faculty and students.

- **Existing Faculty**

- Dr. S.N.Sachdeva, Assistant Professor
Ph.D., M.E. (Highways)
- Dr. Parveen Aggarwal, Lecturer
Ph.D., M.E. (Highways)
- Highly qualified faculty is available from other specializations of Civil Engg Deptt / other disciplines to teach subjects of interdisciplinary nature.

- **Additional Load**

40 hours per week for both years of M.Tech. (@ 4 periods per day)

- **Additional Staff Requirement**

1-Professor (12 hours) + 2- Assistant Professors (14 hours each) + 1-Lab Tech. + 1- Lab Attendant / Peon

Category of Staff	Designation	Gross Annual Emoluments (Rs.)	Number to be added in different project years					Total Staff to be added
			1	2	3	4	5	
			2006-07	07-08	08-09	09-10	11-12	
Academic	Professor	3,60,000	1					1
	Asst Prof.	3,00,000	1	1				2
	Lab Tech.	96,000	1					1
	Lab Attendant	72,000	1					1

• Sustainability of the Course

Same fee structure as being followed for the other M.Tech courses presently running in the Institute is proposed to be followed. However, after funding from the TEQIP project is over and the proposed M.Tech Course is not given funds from any other source, a fee of Rs 15000/- per semester (Rs. 2500/- p.m.) may be charged from the students. In that case the funds position will be:

- o Total funds generated through fee per month:
 2500×40 (20 first yr + 20 second yr students) = 100,000/-
- o Total funds needed to meet the salary requirement of the above staff per month:
 1- Professor (30,000) + 2-Assist Prof. (25,000 x 2) + 1-Lab Tech (8000) + 1-Lab Attendant / Peon (6000) = 94,000/-
- o As multi-level and multi-back-background entry has been proposed with full flexibility in the timings and selection of the subjects, it is believed that the programme will be able to attract a large number of students including the in-service personnel.
- o From the above, it is hoped that the proposed P.G. programme will be able to sustain even after the funding from the project is over.

Justification and Need of Starting M.Tech Course in Transportation

The progress of a country to a great extent depends upon its systems of transportation. For rapid growth of economy, the transportation means have to be very efficient. With the advent of liberalization and globalization of our economy, a great need is felt to provide for fast and efficient transportation in the country to meet the demands of increased traffic for which good roads are required along with other modes of transportation. As a result, transportation has become a **thrust area of the Government**. Some really very big projects like National Highway Development Project (Golden Quadrilateral and North-South-East-West Corridor Project) and PMGSY have been started in the Transportation Sector. The outlay for both the projects is more than one lac crore. Similarly other big projects like improvement of riding quality of roads, Mass Rapid Transit Systems in big cities like Delhi, improvements in Railway, Waterway and Airway sectors have already started / likely to be started in near future. **Implementation of all these projects require the availability of technically advanced manpower in the country.** With the rapid growth and development of our

economy, the demand for transport sector will further increase in future necessitating the need of more Transportation Engineers in the country.

In order to meet the requirements of making the technologically advanced manpower available in the country, an M.Tech. Course in Transportation is fully justified specially in view of the fact that **only a few of the institutes in the region are offering this course at the moment**. The proposed course will also provide an opportunity to the in-service transport personnel of the region to get trained to the latest developments and new techniques in the transportation sector. The training and knowledge gained through the course when applied in the field would enrich the community, society and the country as a whole by bringing in the benefits of improved transportation in the country leading to better living standards in the country.

India is having the second largest network of roads in the world having more than 33 lac k.m. of roads which require many transport engineers to meet its maintenance and construction activities. Moreover, about 40 % of our villages are still to be connected by all-weather roads. Our urban centers have grown disproportionately in the absence of any scientific planning and **need the services of transport engineers to mitigate the problems of congestion, accidents, delays and vehicular pollutions**. These all points to lot of developmental activities in this sector in near future. Thus, out of various transportation sectors, **the road sector alone has the potential to absorb many transportation engineers**. The transportation engineers of the Institute are most likely to be absorbed in various Government / Private organizations in the transport sector such as States PWD (B&R) Depts, CPWD, Railways, RITES, IRCON, CRRI, Other Research labs, Educational / Engineering Institutes, Pollution Boards, World Bank Projects, MORD, MORTH, NRRDA, NHA, Private Sector Organisations / Consultancy Firms dealing with Transport Planning, Design, Construction and Maintenance of Roads / Railways / Other modes of transportation, and Town & Country Planning Depts, Airport Authority of India, Various Port Trusts, etc.

Capability to Run the Course

- o The Transportation Section is a part of Civil Engineering Department, N.I.T.Kurukshetra, which is an autonomous Institution having good managerial, administrative, academic and financial practices creating the ambience for excellence.
- o The department is **well equipped with physical and learning resources** in the form of good labs, library and Internet connected computational centre. The department has highly qualified (Ph.D.s) and experienced faculty to teach the subjects in the area of

proposed P.G.Course in Transportation. It has **One Assistant Professor and one Senior Lecturer, both Doctorates in the field of Transportation Engineering**. The department also has Professors and other faculty from the related fields of Soil, Structure, Hydraulics, Operation Research and Remote sensing to teach the elective subjects as proposed in the programme.

- o **The Transportation Lab of the department has been recently modernized** in 2002 through a MODROB Project of MHRD. An Advanced Transportation Lab has also been set up recently.
- o The senior most faculty in the Transportation section, that is, Dr. S.N.Sachdeva is currently completing one **Research Project of MHRD** on 'Evaluation of Causal Factors of Road Accidents' as Principal Investigator of the project.
- o The Transportation Faculty has to their credit more than 50 papers published in various International / National Journals / Conferences.
- o The Transportation Section is deputed as **State Technical Agency** by the Central Govt. for the implementation of Pradhan Mantri Gram Sadak Yojna in Haryana. In this connection, it provided consultancy and guidance to the State Govt. and scrutinized proposals of roads worth about **Rs. 200 crores** so far. The Transportation section is also providing consultancy to various other organizations to the tune of about Rs. 7-8 lacs per annum every year and earning revenue for the institution.
- o The Transportation Section is having effective linkages with Central Roads Research Institute, N.Delhi, Ministry of Rural Development, Govt. of India; National Rural Roads Development Agency, Govt. of India; and IIT.Roorkee for the purpose of carrying out various schemes of research and consultancy.
- o The Transportation Section is providing service to the community in the form creating trained manpower, and research and consultancy conducted / provided to provide better roads / modes of transportation that will lead to improved economy of the country.
- o **The proposed course provides multi-background and multi-point entry** to the students including the in-service professionals.

In view of vast experience of the highly qualified faculty, the availability of the adequate physical and learning resources, and the elements of multi-background and multi-point entry being in-built into the proposed course of M.Tech. in Transportation, it is assured that the Civil Engineering Department is fully capable to implement and execute the objectives of the proposed project.

DEPARTMENT OF ELECTRICAL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY KURUKSHETRA

APPENDIX-VII

No. DEE/2005/317

Dated: 28.12.2005

Kindly find herewith the proposal for starting a new course of M.Tech. (Elect. Engg.) with specialization in Power Electronics for your kind information and further necessary action at your end.


(SP Jain)
Chairman

Dean (Acad)

**DEPARTMENT OF ELECTRICAL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY KURUKSHETRA**

Name of the Course: M.Tech.(Elect. Engg.) with specialization in Power Electronics & Drives.

Preamble : There are only few Institutes around NIT Kurukshetra, ^{having} M.Tech.(Electrical Engineering) with specialization in Power Electronics and Drives. This course will help in generating additional manpower in the area of Power Electronics and Controls of Electric Drives. At present, Power Electronics and Control of Electric Drives is necessary almost in all big industries – Railways, Steel Plants, Textiles Mills etc. Metro in the neighborhood may also require such specialized manpower.

Starting Year : July, 2006

Intake : 18 students

Eligibility for course : B.Tech. (Electrical Engineering)

Proposed Structure : Same as for other M.Tech. courses running in Electrical Engineering Department

Proposed Course Curriculum: Details in Annexure-1

Class rooms : One with a seating capacity of at least 20 students.

Faculty : 1 Prof. + 2 Asstt. Profs. + 1 Lab Tech. + 1 Lab. Attendant

Category of Staff	Designation	Gross Annual Emoluments	No. to be added in different project years		Total staff to be added	Remarks
			2006-07	2007-08		
Academic	Professor	3,60,000/-	—	1	1	—
	Asstt.Prof./ Lecturer	3,00,000/-	1	1	2	—
	Lab. Tech.	96,000/-	1	1	1	—
	Lab Attendant	72,000/-	1	1	1	—

Laboratory : Power Electronics Lab, Machines and Drives Lab will need to be updated to cater to the needs of this course.

ANNEXURE-1

DEPARTMENT OF ELECTRICAL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY KURUKSHETRA

MASTER OF TECHNOLOGY (ELECTRICAL ENGINEERING)
 POWER ELECTRONICS & DRIVES SPECIALIZATION
 W.E.F. 2006-07

FIRST SEMESTER

Approved in DAC Meeting held on 27.12.2005
 Approved in Senate Meeting held on

Course No.	Title	Schedule of Teaching				Credit Point
		Lecturer	Tutorial	Practical	Total	
ET-605*	Modeling and Analysis of Electrical Machines	3	1	--	4	3.5
ET-531	Power Electronic Devices	3	1	--	4	3.5
ET-501**	Advanced Power System Analysis	3	1	--	4	3.5
ET-561***	Microprocessors and Digital Signal Processors	3	1	--	4	3.5
ET-567****	Digital Control Systems	3	1	--	4	3.5
ET-533	Power Electronics Lab	--	--	3	3	1.5
	Total	15	5	3	23	19.0

- * Common with M.Tech. 3rd Semester, PS-Specialization (Elective)
 ** Common with M.Tech. 1st Semester, PS-Specialization
 *** Common with M.Tech. 1st Semester, PS & CS Specialization
 **** Common with M.Tech. 1st Semester, CS-Specialization

For Theory Courses : During Semester Evaluation weightage = 50%
 End Semester Examination = 50%

For Practical Courses: During Semester Evaluation = 60%
 End Semester Examination = 40%

**DEPARTMENT OF ELECTRICAL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY KURUKSHETRA**

**MASTER OF TECHNOLOGY (ELECTRICAL ENGINEERING)
POWER ELECTRONICS & DRIVES SPECIALIZATION
W.E.P. 2006-07**

SECOND SEMESTER

Approved in DAC Meeting held on 27.12.2005

Approved in Senate Meeting held on

Course No.	Title	Schedule of Teaching				Credit Point
		Lecturer	Tutorial	Practical	Total	
ET-508*	Power Apparatus and machines	3	1	-	4	3.5
ET-532	Electric Drives	3	1	-	4	3.5
ET-534	AC Controllers	3	1	-	4	3.5
ET-562**	Control Devices	3	1	-	4	3.5
ET-536	System Modeling and Optimization	3	1	-	4	3.5
ET-538	Electrical Machines and Drives Lab	--	--	3	3	1.5
ET-540	Seminar	--	--	1	1	1.0
	Total	15	5	4	24	20.0

* Common with M.Tech. 1st Semester, PS Specialization

** Common with M.Tech. 2nd Semester, CS Specialization

For Theory Courses : During Semester Evaluation Weightage = 50%
End Semester Examination = 50%

For Practical Courses: During Semester Evaluation = 60%
End Semester Examination = 40%

DEPARTMENT OF ELECTRICAL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY KURUKSHETRA

MASTER OF TECHNOLOGY (ELECTRICAL ENGINEERING)
POWER ELECTRONICS & DRIVES SPECIALIZATION
 W.E.F. 2006-07

THIRD SEMESTER

Approved in DAC Meeting held on 27.12.2005
 Approved in Senate Meeting held on

Course No.	Title	Schedule of Teaching				Credit Point
		Lecturer	Tutorial	Practical	Total	
ET-631	PLC and Microcontrollers	3	1	-	4	3.5
ET-633	Computer Aided Design of Electrical Machines	3	1	-	4	3.5
ET-667*	Intelligent Control	3	1	-	4	3.5
ET-635	Simulation Lab	-	-	3	3	1.5
	Total	9	3	3	15	12

*Common with M.Tech. 3rd Semester, PS Specialization

For Theory Courses : During Semester Evaluation Weightage = 50%
 End Semester Examination = 50%

For Practical Courses: During Semester Evaluation = 60%
 End Semester Examination = 40%

**DEPARTMENT OF ELECTRICAL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY KURUKSHETRA**

**MASTER OF TECHNOLOGY (ELECTRICAL ENGINEERING)
POWER ELECTRONICS & DRIVES SPECIALIZATION
W.E.F. 2006-07**

FOURTH SEMESTER

Approved in DAC Meeting held on 27.12.2005

Approved in Senate Meeting held on

Course No.	Title	Schedule of Teaching				Credit Point
		Lecturer	Tutorial	Practical	Total	
ET-632	Dissertation	--	--	20	20	20
ET-634	Seminar on Dissertation	--	--	--	--	05
	Total	--	--	20	20	25

For Theory Courses : During Semester Evaluation Weightage = 50%
End Semester Examination = 50%

For Practical Courses: During Semester Evaluation = 60%
End Semester Examination = 40%

Item 5.5: To consider starting of an M.Tech. course in Environmental Engineering in Civil Engineering Department

The rapid economic growth for improving quality of life and meeting requirements of increasing population is causing environmental damage on one hand and depletion of pervious resources on the other hand. For minimizing adverse impacts and optimum use of resource careful disposal of wastes, optimization of process performance and environmentally sustainable development through project planning are need of the hour. In view of this trained technical manpower is needed for improving health, global environment are prosperity of citizens through proper environmental management.

Keeping in view the importance of conservation of Environmental quality and the specialized knowledge required on the subject, it is proposed to start a new M.Tech Course in Environmental Engineering in Civil Engineering Department of the Institute from session 2006-07.

The proposed course will provide an opportunity to in-service personnel for updating their knowledge about latest techniques and innovations for environmental management to suit present and future requirements of the country. The proposed P.G. Course is planned to meet need of technical manpower requirement for industrial growth with optimum resource utilization, environmental protection, adequate and safe water supply, and conservation of natural resources and for sustainable development of country and mankind as a whole.

The details of the course are appended in **Appendix-VIII Page 70 to 73.**

The Senate may consider and approve.

ANNEXURE-II

NEW COURSE TO BE STARTED

- Name of the Course: **M.Tech. in Environmental Engineering**
- Starting Year: **July, 2006**
- Total Intake of Students: **20** (10 seats for regular students through GATE + 10 seats for in-service / part-time candidates. The seats of both categories are interchangeable.) The candidates will be allowed to join the M.Tech. at different points of time at the start of each semester.
- Qualifications for M.Tech.: **Multi-background entry** is proposed with B.Tech. in Civil Engg./Chemical Engg./Environmental Engg./M.Sc. in Environmental Science or equivalent. Candidates with background of M.Sc. Chemistry/Biochemistry/Microbiology/Biotechnology/ Geology / Geography and working in environmental related departments shall also be eligible.
- Proposed Fee Structure: Same as for the other M.Tech Courses presently running in the Institute.
- Duration of the P.G. Course: **Multi-level entry** is proposed with 2 Years duration for regular students and maximum of 5 years duration for the students joining the M.Tech. at different points of time. The students will be allowed to join the M.Tech. at the start of each semester. The students shall be free to select any number of courses in a semester subject to the condition that the duration of M.Tech. shall be minimum 2 years and maximum of 5 years.

- **Proposed Course Curriculum**

- I-Semester

1. Environmental Chemistry and Microbiology
2. Principles of Water Supply and Treatment
3. Water Quality Management
4. Environmental Lab-I
5. Elective-I
 - (i) Application of Remote Sensing in Environment
 - (ii) Fate and Transport of Pollutants
 - (iii) Environmental Policies and Legislation
 - (iv) Earth and Environment

- II-Semester

1. Urban Hydrology and Wastewater Management
2. Air Pollution
3. Environmental Pollution and Impact Assessment
4. Design of Water Treatment Processes
5. Environmental Lab-II

- III-Semester

1. Solid Waste Management
2. Design of Wastewater Treatment Processes
3. Industrial Waste Management
4. Project
5. Elective-II
 - (i) Principles of Instrumentation and Mathematical Modelling
 - (ii) Thermal and Noise Pollution
 - (iii) Water Retaining Structures
 - (iv) Disaster Management

- IV-Semester

Dissertation

• **Sustainability of the Course**

Same fee structure as being followed for the other M.Tech courses presently running in the Institute is proposed to be followed. However, after funding from the TUQP project is over and the proposed M.Tech Course is not given funds from any other source, a fee of Rs 15000/- per semester (Rs. 2500/- p.m.) may be charged from the students. In that case the funds position will be:

- o Total funds generated through fee per month:
 2500×40 (20 first yr + 20 second yr students) = 100,000/-
- o Total funds needed to meet the salary requirement of the above staff per month:
 1- Professor (30,000) + 2-Asst Prof. (25,000 x 2) + 1-Lab Tech (8000) + 1-
 Lab Attendant / Peon (6000) = 94,000/-
- o As multi-level and multi-back-background entry has been proposed with full flexibility in the timings and selection of the subjects, it is believed that the programme will be able to attract a large number of students including the in-service personnel.
- o From the above, it is hoped that the proposed P.G. programme will be able to sustain even after the funding from the project is over.

• **Justification and Need of Starting P.G. Course in Environmental Engineering**

The rapid economic growth for improving quality of life and meeting requirements of increasing population is causing environmental damage on one hand and depletion of precious resources on the other hand. For minimizing adverse impacts and optimum use of resources careful disposal of wastes, optimization of process performance and environmentally sustainable development through project planning are need of the hour. In view of this trained technical manpower is needed for improving health, global environment and prosperity of citizens through proper environmental management. The proposed course will provide an opportunity to in-service personnel for updating their knowledge about latest techniques and innovations for environmental management to suit present and future requirements of the country. The proposed P.G Course is planned to meet need of technical manpower requirement for industrial growth with optimum resource utilization, environmental protection, adequate and safe water supply, and conservation of natural resources and for sustainable development of country and mankind as a whole.

Item 5.6 : To note the change in the allocation of Theory and Sessional marks

It is proposed that as per the new scheme under Grade Based Examination System, the marks for sessional & theory for all the subjects be changed as follows:

		Existing Marks	Amended Weightage
Theory Papers	Sessionals (Class tests and teacher's assessment)	25	50
	End Semester examination	75	50
Practicals	Sessionals (Mid-Semester examination and teacher's assessment)	*	60
	End Semester examination	*	40

- * Varies with different subjects.
The Senate may consider and approve.

Item No.5.7 To consider the modifications of the syllabi of the subject of Physics-I (PHT-105)

Modifications have been proposed in the syllabi of the subject of Physics (PHT-105). Copy of the existing and the proposed syllabi forwarded by the BOS of the Department is being produced in **Appendix IX from page 76 to 78 (Ph.)**

The Senate may consider and approve.

DEPARTMENT OF APPLIED PHYSICS
NATIONAL INSTITUTE OF TECHNOLOGY (DEEMED UNIVERSITY)
KURUKSHETRA-136 119

No. Ph-2005/ 871

Dated: 28.12.2005.
21

In the meeting of the Board of Studies held on 30.5.2005, the members suggested some minor changes in the syllabus for B.Tech Ist Semester Physics-I (PhT-105) and the syllabus in the final form was approved (Annexure-I). A copy of the old syllabus and new syllabus is being sent to you for placing the same as an agenda item in the coming Senate meeting.


(S.K.CHAKRAVARTI)
CHAIRMAN

Dean(Academic)

B.TECH I SEMESTER (COMMON TO ALL BRANCHES)

ANNEXURE - J
(RENEW PAPER)

Physics-I (PHT-105)

L T P
3 1 2Theory : 50
Total : 50
Time : 3 hours

UNIT I: CLASSICAL PHYSICS

PHYSICAL OPTICS:Interference: Division of wave front - Fresnel biprism, Division of amplitude - Newton rings, Michelson interferometer and its applications. (3)Diffraction: Difference between Fraunhofer and Fresnel diffraction, Fraunhofer diffraction at a slit, Plan transmission diffraction grating, its dispersive and resolving power. (4)Polarization: Polarized and unpolarized light, double refraction, Nicol prism, quarter and half wave plate; Polarimetry, Diquartz and Laurent's half-shade polarimeters, Simple concepts of Photoelasticity. (4)DIELECTRICS: Dielectrics- Molecular theory, polarization, displacement, susceptibility, dielectric coefficient, permittivity & various relations between them. Expression of Gauss Law in the presence of a dielectric, Energy stored in electric field, Behavior of dielectrics in ac fields-simple concepts, dielectric losses. (5)

UNIT II: MODERN PHYSICS

QUANTUM PHYSICS: Drawbacks of Classical Physics, Introduction to quantum mechanics- simple concepts, discovery of Planck's Constant, Group velocity and phase velocity, Schrodinger wave equation, Postulates of quantum mechanics, Time dependent and time independent Schrodinger wave equations. Elementary ideas of quantum statistics. (5)X-RAYS: Production of X-rays, continuous and characteristic X-rays, Moseley Law, absorption and diffraction of X-rays, Bragg's law and its applications, Compton scattering. (5)SPECIAL THEORY OF RELATIVITY: The Michelson-Morley experiment, relativistic transformations, length contraction, time dilation, variation of mass with velocity, mass-energy equivalence. (3)NUCLEAR ENERGY: Nuclear fission, moderators, nuclear reactors, reactor criticality & neutron cross-section, nuclear fusion; interaction of radiation with matter (basic concepts), Radiation Detectors-ionization chamber, GM Counter, scintillation and solid state detectors, cloud chamber and bubble chamber. (7)SUGGESTED BOOKS:

Optics	- F. W. Sears
Physics of the Atom	- Wehr, Richards & Adair
Perspectives of Modern Physics	- Arthur Beiser
Physics-I,II	- Halliday and Resnick
Engineering Physics	- S.K. Srivastava and R.A. Yadao

NOTE: Eight questions will be set in the question paper, minimum four from each unit. Candidates will be required to attempt five questions selecting at least two questions from each unit.

B.TECH I SEMESTER (COMMON TO ALL BRANCHES)

Physics-I (PHI-105)

L T P	Theory	: 125
3 1 2	Total	: 125
	Time	: 3 hours

UNIT I: CLASSICAL PHYSICS

PHYSICAL OPTICS: Interference: Division of wave front – Fresnel's biprism; Division of amplitude interference – Newton's rings, Michelson interferometer and its applications.

Diffraction: Difference between Fraunhofer and Fresnel diffraction; Fraunhofer diffraction through a slit. Plane transmission diffraction grating, its dispersive and resolving power.

Polarization: Polarized and unpolarized light; double refraction; Nicol prism, quarter and half wave plates, Polarimetry: Biquartz and Laurent's half-shade polarimeters. Simple concepts of Photoelasticity. (8)

WAVES AND OSCILLATIONS: Simple Harmonic Oscillations, Simple concepts of Harmonic Oscillator, Resonance, Quality factor. E.M. wave theory-review of basic ideas, Maxwell's equations and their experimental basis, simple plane wave equations, simple concepts of wave guides and co-axial cables, Poynting Vector. (6)

DIELECTRICS: Dielectrics- Molecular theory, polarization, displacement, susceptibility, dielectric coefficient, permittivity & various relations between these Gauss's Law in the presence of a dielectric; Energy stored in an electric field, Poisson's and Laplace's equations, Divergence and curl of a vector, Stoke's theorem (derivations not required in all equations and theorems) Behavior of dielectrics in AC fields-simple concepts, dielectric losses. (6)

UNIT-II: MODERN PHYSICS

QUANTUM PHYSICS: Difficulties with Classical Physics, Introduction to quantum mechanics- simple concepts, discovery of Planck's Constant, Group velocity and phase velocity, Schrodinger wave equation, Postulates of quantum mechanics, Time dependent and time independent Schrodinger wave equations, Elementary ideas of quantum statistics. (6)

SPECIAL THEORY OF RELATIVITY: The Michelson-Morley experiment; relativistic transformations; variation of mass with velocity; mass-energy equivalence. (5)

NUCLEAR ENERGY: Neutron Cross-section, Nuclear fission, Moderators, Nuclear reactors. Reactor criticality, Interaction of radiation with matter (basic concepts), Radiation Detectors- Ionization chamber; G.M. Counter; Scintillation and solid state detectors. Cloud chamber and bubble chamber. (6)

SUGGESTED BOOKS:

Optics	- F.W.Sears
Physics of the Atom	- Wehr, Richards & Adair
Perspectives of Modern Physics	- Arthur Beiser
Physics-I,II	- Halliday and Resnick
Engineering Physics	- S.K.Srivastava and R.A.Vadav

NOTE: Eight questions will be set in the question paper, minimum four from each unit. Candidates will be required to attempt five questions selecting at least two questions from each unit.

Item 5. 8: To consider modifications in the syllabi of B.Tech. & M.Tech. Programmes of Mechanical Engineering.

It is proposed to revise the B. Tech and M.Tech. Syllabi in Mechanical Engg. Deptt. of the Institute for the session 2006-07 as per details appended herewith.

The details of the syllabi are appended in appendix-X From page 80 to 121 (M II)

The Senate may consider and approve.

**B.Tech. 1st/Ind Semester
(Common to all branches)
MANUFACTURING PROCESSES
MET-103**

L T P/D
3 1 -

Casting:

Patterns, Materials, Types of allowances, Sand casting: types & properties of molding sand; Various molding methods: Core and its types. Permanent mould castings, Co₂ casting centrifugal castings. Die castings: shell molding, Plaster molding, Investment castings. Casting defects, remedies.

Primary Metal Working Processes:

Hot and cold forging. Hot cold rolling. Wire drawing and extension processes.

Metal Shearing and Forming:

Introduction to shearing, notching, lancing, bending drawing, Stretching. Embossing and coining operations. Process and their types Die and punch operations.

Metal Machining Processes:

Lathe – parts and accessories. Specifications. Turning tools, various operations on lathe (turning, taper turning thread cutting drilling boring turning).

Welding and Allied Processes:

Classification gas welding, Resistance welding and its types, thermit welding. Electric arc welding – metal arc welding carbon arc welding. Submerged arc welding. TIG MIG. Welding defects and remedies. Soldering and brazing.

Special Welding Processes:

Electro slag welding, Atomic hydrogen welding, Plasnet arc welding, Ultrasonic welding, Laser welding.

Plastics Processing:

Plastics. Their types and manufacturing properties. Compression molding and Injection molding.

Suggested Books:

- | | |
|--|-------------------------------|
| 1. Manufacturing Processes | Bageman |
| 2. Manufacturing Materials and Processes | Lindberg |
| 3. Principles of Manufacturing Materials | Campbell |
| 4. Manufacturing Science | Amitabhe Chjose & Kumar Malik |
| 5. Workshop Technology | Hazari, Chowdhary Vol.I & II |
| 6. Workshop Technology Vol. I& II | Raghuwanshi |

**B. Tech. 2nd Semester
ENGINEERING GRAPHICS-II
MET-104**

L T P/D
- - 6

Curves:
Conics, Cycloid, Epicycloid, Hypocycloid, Involute, Evolute, Spiral.

Inter-Section:
Interpenetration of simple solids i.e. prism with prism, Cylinder with cylinder, Cylinder with prism, cone-with cylinder and cone with prism (AXIS of solids horizontal or vertical only).

Development:
Development of right and oblique prism, Cylinder, Cone and pyramids, Sectioned solids, Practical Problems.

Isometric Projections:
Isometric scale, Isometric projections of simple solids and their combinations.

Engineering Graphics Standards:
Projections, Sectioning, Conventional representation, Dimensioning, Basis of tolerancing and surface finish symbols, BIS, ISO, DIN.

Fasteners:
Screw, Threads and threaded fasteners, Rivets and riveted joints, Welds and welded joints.

Machine Drawing:
Free hand drawing of simple machine parts i.e. cotter joint, knuckle joint and shaft couplings, pipe fittings and pipe joints.

Suggested Books:

- | | | |
|----|-------------------------------|-----------------------|
| 1. | Engineering Drawing | N.D. Bhatt |
| 2. | Machine Drawing | N.D. Bhatt |
| 3. | Machine Drawing | N. Sridheshwar |
| 4. | Engineering Drawing | P.S. Gill |
| 5. | Machine Drawing | P.S. Gill |
| 6. | Fundamentals of Engg. Drawing | Luzadder & Duff (PHI) |

B. Tech. (Third Semester) Mechanical Engineering

MET-201 Thermodynamics

L	T	PI/D	Total
3	1	-	4

1. Concepts of Thermodynamics

Definition, Classical and statistical thermodynamics, Macroscopic and microscopic approaches, thermodynamic system, state boundary, surroundings and universe; thermodynamic properties, thermodynamic equilibrium, Quasi-static process, zeroth law of thermodynamics, work and heat transfer.

2. The First Law of Thermodynamics

First law for a closed system; Application of the First Law to non-flow processes viz constant volume, constant pressure, constant internal energy process, Reversible adiabatic and reversible polytropic processes; steady Flow Energy Equation, its application to water, steam or gas turbines, pumps, compressors boilers, condensers, nozzles etc; Transient flow processes; PMM1, Enthalpy.

3. The Second Law of Thermodynamics

Limitations of the First Law, Heat source & sink, Heat engine, Refrigerator & Heat Pump, The Second Law Kelvin Planck and Clausius statements; Reversible & Inversible processes; the Carnot theorem, Absolute temperature scale, Inequality of Clausius, characteristics of Entropy, Entropy change for open & closed systems The Third Law of Thermodynamics, Validity & limitations of the Laws of Thermodynamics.

4. General Thermodynamic Relations

Maxwell Relations, specific heat relations, energy equations; relations between internal energy and entropy, Joule Thomson Coefficient, Clausius clapeyron equation, Application of thermodynamic relations. Availability and the Gibbs function, Availability in closed systems, Availability and steady flow open system, The Gibbs function and the steady flow system.

5. Properties of Fluids

Properties of liquids and vapours; $p-v$, $p-t$, $t-s$ and $h-s$ diagrams for a pure substance (water), Tables of properties, Expansion of steam, Hyperbolic, Isentropic and throttling processes; determination of dryness fraction. Properties of a perfect gas; Equation of state; Property relation for internal energy, enthalpy & heat capacities of an ideal gas; $p-v-T$ surface, Triple point, Real gases, properties of real gases, Vander Waals gas, Reduced

equation of state, Generalized compressibility charts, Virial equation. Properties of ideal gas mixtures.

Reference and Text Books:

1. Engg. Thermodynamics: Roger, GFC & Mayhew, Y.R, ELBS
2. Engg. Thermodynamics: Nag, P.K., TMH
3. Engg. Thermodynamics: Achuthan, M., TMH.

B.Tech. (Third Semester) Mechanical Engineering
MET-203 Strength of Materials-I

L	T	P/D	Total
3	1	-	4

1. **Simple Stress and Strain:**

Mechanical properties of solids, Concept of stress and strain, Normal and shear stresses, Hooke's law, Principle of St. Venant, Stress-Strain diagrams, Principle of superposition, Stress and strain in bars subjected to tension and compression, Elongation due to self weight, Composite sections, Thermal stresses, Poisson's ratio, Relation between elastic constants.

2. **Compound Stresses and Strains:**

Stresses on an inclined plane, 2-D stress and strain systems, Conjugate shear stress at a point on a plane, Principal stresses and principal planes, Surface and volumetric strains, Principle strain and principle axes of strain, Mohr's circle of stresses and strains in 2-D.

3. **Torsion of circular shafts:**

Torque and horse-power, Angle of twist, Shear stresses in hollow and solid shafts within elastic limit, Derivation of torsion equation, Assumptions, Stepped and composite shafts, Closed coil helical springs subjected to axial loads and couple.

4. **Thin Walled Vessels:**

Thin cylinders subjected to internal pressure, Circumferential and longitudinal stresses and strains, Maximum shear stress, Increase in diameter and volume of vessel, Thin spherical shells subjected to internal pressure, Thin cylinders with hemispherical ends, Wire winding of thin cylinders.

5. **Shearing force and bending moment in beams:**

Types of loads and supports, various types of beams, Inter relation between S.F. and B.M. diagrams, Shearing force and bending moment diagrams for various types of loading and supports, Maximum bending moment and point of contraflexure.

6. **Theory of simple bending:**

Stresses due to simple bending of initially straight beams, theory and assumptions, geometrical characteristics of sections, Application of bending formula to simply supported beams of circular, rectangular and I sections, Flitched beams.

Shear stress distribution: Shear stresses in beams of various sections like a rectangular section, a I - section, a circular section, a T - section, a triangular section, a thin circular section (ring), and a few general sections i.e. any combination of the above mentioned sections subjected to shear force; Shear center; Deflection of beams due to shear stresses.

7. **Combined bending, Direct and Torsional loads:**

Short struts subjected to eccentric loads, middle third rule for rectangular sections, middle quarter rule for circular sections, shafts subjected to combined bending and twisting loads, equivalent twisting moments and equivalent bending moments.

8. **Columns:**

Columns under axial load, concept of instability and buckling, slenderness ratio, various end conditions, Euler's theory for initially straight columns, assumptions and limitations, empirical formulae.

9. **Theories of failure:**

Different theories, significance, graphical representation.

Reference and Text Books:

1. Strength of Materials - By Ramamrutham, Dhanpat Rai Pubs.
2. Strength of Materials - By G.H.Ryder, ELBS
3. Strength of Materials - By Sadhu Singh, Khanna Pubs.
4. Engineering Mechanics of Solids - Popov, Prentice-Hall
5. Mechanics of Materials - By Kirpal Singh

B.Tech. (Fourth Semester) Mechanical Engineering
MET-204 Strength of Materials - II

L	T	P/D	Total
4	1	-	5

1. THICK WALLED VESSELS:

Introduction; Lame's theory; Longitudinal, principal and shear stresses in thick cylinders subjected to external and internal pressures; Variation of radial and hoop stresses with thickness; Strains in thick cylinders; Compound cylinders; Stresses and strains in thick cylinders subjected to high pressures; Wire wound thick cylinders; Stresses and strains in thick spherical vessels subjected to internal and external pressures.

2. ROTATING DISCS AND RINGS:

Introduction; Stresses and strains in rotating rims or rings of uniform thickness; Stresses and strains in rotating thin solid and hollow discs of uniform thickness; Stresses and strains in rotating thin disk of uniform strength; Stresses and strains in rotating solid and hollow cylinders.

3. SLOPE AND DEFLECTION:

Introduction; Macaulay's method; Slope and deflection of cantilever beams, simply supported beams, fixed beams, continuous beams and overhanging beams subjected to point loads and/or uniformly distributed loads; Slope and deflection of propped (elastic and rigid) cantilevers and beams subjected to point loads and/or uniformly distributed loads.

4. BENDING OF CURVED BARS:

Introduction; Stresses in bars of initial large radius of curvature; Stresses in bars of initial small radius of curvature; Stresses in crane hooks; Stresses in circular rings; Stresses in simple chain link; Stresses distribution in above family of curved bars; Deflection of curved bars; Deflection of crane hooks, rings, and simple chain links.

5. UNSYMMETRICAL BENDING:

Introduction; Flexural axis; Properties of beam cross-sections; Principal axes and product moment of inertia; Moment ellipse; Slope of neutral axis; Stresses and deflections in a beam due to unsymmetrical bending moment.

6. **SPRINGS:**

Introduction; Stresses and deflections in open coiled helical springs subjected to axial loads and/or twisting couples; Stresses and deflection in leaf springs, flat spiral springs; Concentric springs.

7. **COLUMNS:**

Introduction; Stresses and deflections in eccentrically loaded straight long columns with different end conditions; Stresses and deflections in long columns with initial curvature for different end conditions; Stresses and deflection in straight long columns with transverse loads for different end conditions.

8. **STRAIN ENERGY METHOD:**

Introduction; Strain energy and resilience; Strain energy due to different type loads; Strain energy and deflection of beams due to bending and shear; Strain energy of shafts in twisting; Energy methods in determining spring deflections; Castigliano's and Maxwell's theorems and their applications.

Reference and Text Books:

- | | |
|---|-------------------------------------|
| 5. Strength of Materials | - By Ramamrutham, Dhanpat Rai Pubs. |
| 6. Strength of Materials | - By G.H.Ryder, ELBS |
| 7. Strength of Materials | - By Sadhu Singh, Khanna Pubs. |
| 8. Engineering Mechanics of Solids: By Popov, Prentice-Hall | |

B.Tech. 4th Semester (Mech. Engg.)
MET-206: Steam and Power Generation

L	T	P/D	Total
3	1	-	4

1. Steam Boilers:

Introduction, Classification of boilers, fire tube & water tube boilers, their comparison, description of boilers. Lancashire, Locomotive, Babcock Wilcox, Fluidized bed and super critical boilers (Principle only). Boiler mountings & accessories, Natural draught, artificial draught: Chimney design, steam jet draught and mechanical draught; calculation of boiler efficiency & equivalent evaporation.

2. Vapour Power Cycles:

Carnot cycle, simple & modified Rankine cycles, Effect of operating variables on Rankine cycle; Rankine cycle with superheat, Reheating & regeneration, Reheat factor, Binary vapour cycle.

3. Steam Nozzles:

Function, shape; variation of velocity, area and sp. Volume, S.F.E.E., Continuity equation, Nozzle efficiency, critical pressure ratio, Physical explanation, Critical pressure, super-saturated flow in nozzles, Design of steam nozzles.

4. Steam Turbines:

Introduction, classification of steam turbines, Impulse Turbine, Working principle, compounding, velocity diagrams, calculation of power output and efficiency, condition for maximum efficiency of a single stage impulse turbine; Blade section, Impulse Reaction turbine, working principle, degree of reaction Parson's turbine, Velocity diagram, calculation of power output, Efficiency & blade height, condition of maximum efficiency, Internal losses in steam turbines, Governing of steam turbine.

5. Steam Condensers:

Advantages of steam condensation, components of condensing plant, types of condenser, Air leakage, vacuum efficiency, calculation of cooling water requirements and air pump capacity, air extraction pumps.

Reference and Text Books:

- | | | |
|----|----------------------------------|--------------------------------|
| 1. | Steam & Gas Turbines: | R. Yadav, CPH |
| 2. | Thermal Engg: | Ballarey, Khanna Pub. |
| 3. | Thermal Engg: | Domkundar & Arora, Dhanpat Rai |
| 4. | Engg. Thermodynamics: | P.K. Nag, TMH |
| 5. | Steam Turbine Theory & Practice: | Kearson, W.J. Pitman. |

B.Tech. (Third Semester) Mechanical Engineering
MET-207 Production Technology - I

L	T	P/D	Total
3	1	-	4

1. **Metal Cutting:**

Basic tool geometry, single point tool nomenclature, Chips- various type and their characteristics, mechanism of chip formation, Theoretical and experimental determination of shear angle. Orthogonal and oblique metal cutting. Metal cutting theories, relationship of velocities, forces and power consumption.

2. **Tool Life and Wear:**

Effect of operating parameters like tool geometry, cutting speed, feed depth of cut, coolant, materials etc. on force, temp, tool life, surface finish etc. Tool life relationship, Taylor's equation of tool life. Tool materials, flank wear, crater wear, mechanism of tool wear.

3. **Economics of metal machining:**

Elements of machining cost, tooling economics, machining economics and optimization.

4. **Drilling and Milling Processes:**

Drilling operation, geometry of twist drills, Thrust, torque and power calculations in drilling. Up milling down milling, various milling operations.

5. **Grinding and super finishing processes:**

Grinding process, wheel characteristics, specifications, lapping, honing.

6. **Metrology:**

Linear and angular measurements, sine bar, auto-collimator, comparators: mechanical, electrical, optical and pneumatic, Surface finish and its measurement, Micro and macro deviations, factors influencing surface finish and evaluation of surface finish.

7. **Machine Tools Vibration and Dynamometry:**

Introduction, effects of vibration on-machine tools, cutting conditions, work piece and tool life, Need for measuring forces, basic requirements of measuring

techniques, design requirements of dynamometers, turning dynamometer and drill dynamometer.

Reference and Text Books:

1. Manufacturing Science - By Ghosh and Mallick, E.W. Press
2. Principles of Metal cutting - By Sen and Bhattacharya, New central book.
3. Metal Cutting Principles - By Shaw, MIT Press, Cambridge
4. Manufacturing Analysis -By Cook, Addison-Wesley
5. Production Engineering Science -By Pandey and Singh

B.Tech. (Third Semester) Mechanical Engineering
MET-209 Kinematics of Machines

L	T	P/D	Total
4	1	-	5

1. Mechanism and machines:

Kinematics, introduction to analysis and synthesis of mechanisms, links, Kinematics' pairs, Degree of freedom, Dynamic chain mechanism, Machine, Four-bar chain, Inversions, Single and double slider crank chain, Quick return mechanisms, Introduction to function generation, Path generation and rigid body guidance.

2. Velocity Analysis:

Velocity determination: Relative velocity methods, Instantaneous center method, Acceleration determination, Kennedy's theorem, Space centrode and body centrode.

3. Acceleration Analysis:

Centripetal and tangential accelerations, Acceleration determination by graphical method using velocity polygons, Coriolis' component of acceleration, Klein's and other constructions.

4. Computer-aided analysis and synthesis of mechanism:

Analytical methods to find velocity and acceleration of four-link mechanism, slider crank mechanism, freudenstein's equation, Coordinate angular displacements of input and output links (Path generation, function generation), Least square technique, Rigid body guidance.

5. Lower pairs:

Pantograph, straight-line motion mechanisms (Peaucellier, Hart, Scott Russel, Grasshopper, Watt, Kempe's, Tchebishev, Parallel linkages) Indicator mechanisms (Simplex, Crosby, Thomson, etc) Automobile steering gears (Davis and Ackermann), Hooks joint (universal coupling), Double hooks joints

6. Friction:

Types of friction, Laws of dry friction, Motion along inclined plane Screw threads, Wedge, Pivots and collars, Plate and cone clutches, Antifriction bearings, friction circle and friction axis, bearings and lubrication. Motion along inclined

plane and screws, Pivots and Collars Thrust bearings, Flat and cone clutches, Friction circle and axis, Power loss in bearings, Bearings lubrication.

7. Cams:

Types of cams and followers, various motions of the follower, Construction of cam profiles, Analysis for velocities and accelerations of tangent and circular arc cams with roller and flat-faced followers.

8. Belts, Ropes and Chains:

Open and crossed belt drives, velocity ratio, slip, material for belts, crowning of pulleys, law of belting, types of pulleys, length of belts, ratio of belt tensions, centrifugal tension, power transmitted by belts and ropes, initial tension, creep, chain drive, chain length, classification of chains.

Reference and Text Books:

1. Theory of Machines - By S.S.Rattan, Tata McGraw Hill
2. Theory of Mechanism and Machines - By Jagdish Lal, Metropolitan Book Co.
3. Mechanism Synthesis and Analysis - By A.H. Soti, McGraw-Hill
4. Mechanism - By J.S. Beggs, McGraw-Hill
5. Mechanics of Machines - By P. Black, Pergamon Press
6. Theory of Machines - By P.L. Ballaney, Khanna Publisher

B.Tech. 4th Semester (Mechanical Engg.)
MET-210: Production Technology –II

L	T	P/D	Total
3	1	-	4

1. Unconventional Machining Processes

Need for unconventional processes, Ultrasonic machining, Electric discharge machining, Electrochemical machining, Electrochemical grinding, Laser beam machining, Electron beam machining – their mechanism of metal removal, process parameters, advantages, limitations and applications.

2. Capstan and Turret Lathe

Limitation of a center lathe, Introduction to Capstan and Turret lathe, Universal Bar equipment, tool layout for simple parts

3. Gear Manufacturing

Classification of gear production methods, gear generation – gear hobbing, gear shaping, gear finishing methods – shaving, burnishing, grinding, lapping, honing.

4. Press Working Tools

Introduction, classification of presses, shearing action, cutting forces, clearance and its effect, shear, angular clearance, stripper, Types of dies – Progressive, compound and combination, center line of pressure and its mathematical calculation.

5. Jigs and Fixtures

Introduction, difference between jig and fixture, principles of location, locating and clamping devices, Jig bushes, Milling fixtures, Turning fixtures, Different Materials for jigs and fixtures, Economics of Jigs and Fixtures.

6. Metal Forming

Metal flow condition, plasticity conditions for plain strain, Friction conditions in metal working, Analysis of forming processes wire drawing, extrusion of circular rods, Theory of forging for plates.

Reference & Text Books

1. Modern Machining Processes :- Panday & Shan, Tata – Mc Graw Hill
2. Manufacturing Science :- Ghosh & Mallick, Affiliated East West Press.
3. Tool Design:- Donaldson, Mc Graw Hill
4. Manufacturing Technology:- P.N. Rao, Tata Mc Graw Hill

B.Tech 5th Semester Mech. Engg.
MET-301: I.C. Engines & Gas Turbines

L	T	Total
3	1	4

1. Introduction:

Internal & external combustion engines; classification, cycle of operation in four stroke and two stroke I.C. Engines, Valve timings, Wankel R.C. Engine.

2. Air Standard Cycles:

Assumptions made in air standard cycles, Otto cycle, Diesel cycle, Dual cycle; comparison of these cycles; Sterling and Ericsson cycles; Air standard efficiency; specific work output, work ratio & mean effective pressure, Deviation of actual cycle from ideal cycle.

3. Combustion in I.C. Engines:

SI engines: Ignition Limits, stages of combustion, Effect of engine variables on Ignition Lag and flame propagation, Abnormal combustion, Detonation, Effect of Engine variable on detonation, Pre-ignition, Octave rating of fuels, SI engine combustion chambers. CI engine: stages of combustion, Delay period, variables affecting delay period, Diesel knock, Cetane rating, CI engine combustion chambers.

4. Carburetion, Fuel Injection & Ignition systems:

Mixture requirements for various operating conditions in SI engines: Elementary carburetor, Calculation of A/F ratio, The complete carburetor. Diesel injection systems: requirements, types, petrol, injection. Requirements of ignition systems, types of ignition systems, ignition timing, spark plug.

5. Lubrication and Cooling:

Total engine friction, Function of the lubrication systems, properties of lubricating oil, service rating of oils, Lubrication systems, engine performance & lubrication. Necessity of engine cooling, Cooling systems, Water cooling, air cooling, Radiators.

6 Engine Testing & Performance:

Performance parameters, BHP, IHP, Mechanical efficiency, $b m e p$, $i m e p$, torque, volumetric efficiency $b s f c$ and $i s f c$, thermal efficiency, Heat balance, Basic engine measurements: fuel and air consumption, brake power, indicated power and friction power, performance curves.

6. Air Pollution and its Control:

Sources and classification of air pollution, Effect on human health, pollutants from IC engines, methods of emission control, Alternative fuels, current scenario on the pollution front.

7. Air compressors:

Single stage reciprocating air compressors, work input, volumetric efficiency, isothermal efficiency, Advantages of multi stage compression, Two stage compressor with inter cooling, perfect inter cooling optimum pressure ratio. Rotary air compressors and their applications.

8. Gas Turbines:

Brayton cycle, components of a gas turbine plant, open and closed types, optimum pressure ration, improvements upon the basic cycle, multi stage compression with inter cooling, multi stage expansion with reheating, Regeneration, Applications of gas turbines.

Reference & Text Books:

- | | |
|--------------------------------|---------------------------------|
| 1. Internal Combustion Engines | : Obert E.F. |
| 2. Internal Combustion Engines | : Mathur & Sharma, Dhanpat Rai. |
| 3. Internal Combustion Engines | : Gill, Smith & Zurlis, IBH |
| 4. Internal Combustion Engines | : Ganesan, TMH |

B.Tech. 5th Semester Mechanical Engineering
MET- 303 Fluid Machines

L	T	P/D	Total
3	1	-	4

1. Principles of Hydraulic machines:

Impact of jet on stationary and moving flat and curved plates, force on series of vanes, Radial vanes, vortex motion, free and forced vortex, jet propulsion of ships.

2. Hydraulic turbines:

Introduction, development of hydraulic turbines, components of hydro-power plant, classification of turbines, Euler's equation and degree of reaction, losses and efficiency of turbines, surge tank and its type.

3. Impulse turbines:

Pelton turbine, its components, number and dimension of buckets, speed ratio, jet ratio, energy conversion, condition for maximum efficiency, design considerations, governing etc.

4. Reaction turbines:

Francis turbine: components, working principles, draft tube, types of draft tube, design considerations, outward vs inward flow reaction turbines, introduction to Deriaz turbine, evolution of axial flow turbines, Kaplan turbine, operation at off design loads, governing etc.

5. Performance of turbines:

Unit quantities, specific speed, runaway speed, characteristics of turbines, cavitations and its effects, cavitation parameters, Detection and prevention of cavitation.

6. Centrifugal pumps:

Introduction, classification & components of centrifugal pumps, principle of working, various heads, energy conversion, Euler's head and its variation with vane shapes, effect of finite number of vanes, losses and efficiencies, minimum starting speed, limitation of suction lift, Net Positive Suction Head (NPSH), multistage pumps, specific speed and performance.

7. Reciprocating pumps:

Working principles, classification, components, discharge, slip, power input, indicator diagram, effect of accelerating head and pipe friction, maximum speed, air vessels, comparison with centrifugal pumps.

8. Dimensional analysis and model testing:

Units and dimensions, dimensional homogeneity, dimensional analysis method: Rayleigh and Buckingham methods, application and limitation of dimensional analysis, dimensionless numbers, similitude laws, model testing of turbine and pumps.

9. Other hydraulic pumps:

Propeller pump, Jet pump, Airlift pump, Gear pump, Screw pump, Vane pump, Radial piston pump, Submersible pump, pump problems

10. Hydraulic systems:

Hydraulic accumulators, hydraulic intensifier, hydraulic lift, hydraulic crane, hydraulic coupling, torque converter, hydraulic ram. Hydraulic valves:- check valve, relief valve, speed control valve, pressure compensating valve, direction control valve, Hydraulic filters and piping.

Reference and Text Books:

1. Fluid Mechanics and Machinery
- By S.K. Agrawal, Tata-McGraw-Hill
2. Fluid Mechanics and Fluid power Engineering
- By D.S. Kumar, Katson Pubs.
3. Fluid Mechanics and Hydraulic Machines
- By S.S. Rattan, Khanna Pubs.
4. Introduction to Fluid Mechanics and Machinery
- By Som and Biswas, Tata-McGraw Hill
5. Fluid Mechanics and Machinery
- By D. Ramadurgaiah, New Age International Publishers.

B.Tech. 5th Semester Mechanical Engineering

MIE- 307 Industrial Engineering

L	T	P/D	Total
3	1	-	4

1. Introduction to Industrial Engineering

Definition, functions of Industrial Engineering, Origin & development of factory system, pioneers of scientific management, types production, concept of productivity, factors affecting productivity.

2. Factory Organization:

Principles of organization, Importance and characteristics of organization, Types of organization-military or line organization, Functional organization, line and staff organization & Committees, Type of organisation.

3. Plant Layout:

Concept and factors governing plant location, rural v/s urban sites, factors affecting plant location, Plant layout, principle & objectives, types of plant layout application.

4. Sales Forecasting:

Introduction, objectives and importance of sales forecasting, Types of forecasting, Methods of sales forecasting- Collective opinion method, economic indicator method, regression analysis, Moving average method, time series analysis. Numerical Problems.

5. Production Planning and Control:

Objectives of PPC, Functions of PPC, preplanning and planning, routing, estimating, scheduling -master schedule, daily schedule, Gantt chart, Dispatching-centralized vs. decentralized, control, follow up and progress reporting.

6. Product Design and Development:

Introduction, Product development, Product characteristics, Role of product development, 3S's - standardization, simplification and specialization. Break - even analysis, Numerical problems.

7. Inventory Control:

Introduction, Functions of inventory, Types of inventory, Inventory Control importance and functions, Inventory costs, Factors affecting inventory control, Various inventory control models, A B C analysis Numerical problems.

8. Materials Handling

Objectives , functions & principle of material handling, methods, types of material handling equipments, factors affecting equipment selection.

9. Wage Payment Plans:

Introduction, Factors affecting wage rates, Characteristics of good wage plans, various methods of wage payment- applications and advantages, wage incentives.

10. Program Evaluation & Review Techniques & Critical Path Method.:

Introduction, Terminology used in P.E.R.T. & C.P.M., Determination of critical path, optimization through C.P.M. Time estimates, Frequency distribution of completion of an activity. Estimation of Project completion Time with use of P.E.R.T. Technique, Numerical problems.

Reference and Text Books:

1. Production Planning and Control : S. Eilon
2. Modern Production Management : S.S. Bufla
3. Industrial Engineering and Operation Research :S.K. Sharma & Savita Sharma
4. Industrial Engineering : B. Kumar

**B.Tech. (6th Semester) Mechanical Engineering
MET- 308 Computer Aided Design**

L	T	P/D	Total
3	1	-	4

1. Introduction:

Introduction to CAD/CAM, Historical developments, Industrial look at CAD/CAM, Introduction to CIM, Basics of geometric and solid modeling, explicit, implicit, intrinsic Polar envelope and parametric equations coordinate systems, Torsion, Frenet-Serret formulae.

2. Transformations:

Introduction, transformation of points and line, 2-D rotation, reflection, scaling and combined transformation, homogeneous coordinates, 3-D scaling, shearing, rotation, reflection and translation, combined transformations orthographic, Axonometric, Oblique and perspective projections.

3. Curves:

Algebraic and geometric forms, Analytical & Synthetic Curves, tangents and normal, blending functions, reparametrization, straight lines, conics, cubic splines, bezier curves and B-spline curves, Rational curves, Non-uniform Rational curves, NURBS; Curve manipulation.

4. Surfaces:

Algebraic and geometric forms, Analytical and Synthetic Surfaces, tangents and twist vectors, normal, blending functions, reparametrization, sixteen point form, four curve form, plane surface, ruled surface, surface of revolution, tabulated cylinder, bi-cubic surface, bezier surface, B-spline surfaces, Coors surface, Blending surface, Offset surface, Triangular patches, Sculptured surfaces, Rational parametric surfaces; surface manipulation.

5. Solids:

Solid models and representation scheme, Fundamentals of Solid Modeling, boundary representation, constructive solid geometry, sweep representation, cell decomposition, spatial occupancy enumeration, Half spaces, Octree Encoding, Pure Primitive Instanting.

Reference and Text Books:

1. CAD/CAM
- By Groover and Zimmer, Prentice Hall
2. CAD/CAM : Theory and Practice
- By I. Zeid, Jata McGraw Hill
3. Mathematical Elements for Computer Graphics
-Rogers & Adams, McGraw Hill.

B.Tech. (7th Semester) Mechanical Engineering
MET- 401 Automobile Engineering

L	T	P/D	Total
4	1	-	5

1. Introduction to Automobile Engineering:

Brief history of automobiles, Main components of an automobile, Brief description of each component.

2. Power requirements in an automobile:

Brief description of constructional details and working of a four stroke I.C. Engine (S.I. Engines and C.I. Engines) including lately developed overhead cam shaft, Multi-cylinder engines, Introduction to recent developments in I.C. Engines- Direct injection systems, Multi-point fuel injection systems, Microprocessor based fuel supply systems, Multi valve engines, Mechanical balancing, Firing Order, Power balancing, Power overlap, Power flow charts.

3. Transmission System of Automobile:

Introduction, Brief description of different components of Transmission System.

(b) Clutch: Introduction to Clutch and its different types, Principle of Friction Clutch, Clutch Lining and friction materials used in Friction Clutches, Torque transmitted, Brief description of Cone Clutch, Single Plate and Multiplate Clutches, Dry and wet clutches, Automatic clutch action, Centrifugal clutches, Electromagnetic clutches, Fluid Flywheel.

(c) Gear Box: Air resistance, gradient resistance and rolling resistance coming across a moving automobile, Tractive effort, Variation of tractive effort with speed, Performance curves (object and need of a gear box), Sliding mesh gear box, Control mechanism, Sliding type selector mechanism, Ball type selector mechanism, Steering column gear shift control, Constant mesh gear box, Synchromesh device, Automatic transmission in general, AP automatic gear box, Torque converter, Torque converter with direct drive, Lubrication of Gear Box.

(d) Propeller Shaft: Functions and requirements of a propeller shaft, Universal joints, Constructional forms of universal joints, Flexible-ring joints, Rubber-bushed flexible joints, Constant-velocity joints.

- (e) Differential: Principle of operation, Constructional details of a typical differential unit, Traction control differentials, Multi-plate clutch type traction control device, Traction control by viscous coupling.
- (f) The back axle: Live back axles, The final drive, Single reduction live axles, Torque reaction, Driving thrust, Torque and thrust member arrangements, Springs serving as torque and thrust members, Hotchkiss Drive with torque reaction member, Single combined torque-thrust reaction member, with springs taking only vertical and lateral loads; Transverse radius rods, Three radius rods, Axle construction, Effects of wheel bearing layout on axle loading, Some actual bearing arrangements, Axle casing construction, The double reduction axles (both steps at the center of the axle and one step at center of axle, the other at road wheels).

4. Running System:

- (a) Wheels and rims, Tyre-its function and constructional details.
- (b) Brakes: Functions and methods of operation, Brake efficiency, Elementary theory of shoe brake, Brake shoe adjustments, A modern rear-wheel brake, Disc brakes, Brake linkages, Leverage and adjustment of the brake linkage, Servo- and power-operated brakes, Vacuum brake operation, Hydraulic Brakes-constructional details and working, Bendix Hydrovac, Direct-acting vacuum servos, Power-operated brakes, A dual power air brake system, Compressed air systems, Actuating cylinders for air brakes.

5. Suspension System:

Suspension principles, Road irregularities and human susceptibility, Suspension system, Damping, Double tube damper, Single tube damper, Lever arm type damper, Springs-Leaf springs, Coil and torsion springs, variable rate springs, Composite leaf springs, Rubber springs, Air springs, Adjustable and self-adjusting suspensions, Interconnected suspension system, Interconnected air and liquid suspensions, Independent suspension system, Different independent suspension layouts, McPherson strut type, Rear suspension-live axle, Torque reaction and axle guidance, Watt's linkage, Rear suspension-dead axles, Rear suspension-independent, McPherson strut rear suspension.

6. Steering Mechanism:

Steering geometry, Castor, Camber, Kingpin inclination, Combined angle, Toe-in, Steering system-basic aims, Ackerman linkage, Steering linkages for independent suspension, Center point steering, Castering or trailing action, Cornering power, Self-righting torque, Steering characteristics-over steer and under steer, Axle beam, Stub-axle construction, Steering column, Reversible and irreversible steering, Rack-and-pinion steering mechanism, Effect of toe-in on steering, Power steering, Vickers System.

7. Recent trends in Automobile Engineering:

Multi-fuel automobiles, Automobiles running on alternate sources of energy, Emission control through catalytic converter, Double catalytic converter, Aspects of pollution control in Automobiles.

Reference and Text Books:

1. The Motor Vehicle
- By Newton, Steeds and Garrett Basic
2. Automobile Engineering
- By Kirpal Singh
3. Automobile Engineering
- By K.M. Gupta, Umesh Publications
4. Auto mechanics
By Croase

B.Tech. (7th Semester) Mechanical Engineering
MET- 405: Statistical Quality Control and Reliability

L	T	P/D	Total
4	1	-	5

1. Introduction

Quality – Basic Concepts: Issues in Quality, factors affecting quality, creating quality by design, product development cycle, economics of quality, Various definitions, ISO definition of quality and its meanings, and various phases till TQM and its meaning to industries, customers and employees, contribution of quality gurus etc. towards quality concepts. Total Quality management: its scope application and implementation. Quality circle: its objectives, structure and techniques, Variability concept in manufacturing –cycle, fishbone diagrams, charts in time philosophy.

2. Quality Control

Basic statistical concepts, various types of distributions, General theory \bar{X} and R chart. Decision preparatory to the control charts. Trial control limits. Selection of subgroups. Charts with variable subgroups. Reject and Revoke, limits for average on \bar{X} charts, modified control limits, specification limits, practical limitations. Control charts for fraction defectives, calculation and plotting of control limits, sensitivity of p chart, applications. Control charts for Defects, difference between defect and defective, calculation and plotting of control limits, application, Pi charts and u charts, plotting of charts. Tests for various control charts. Test for various control charts process capability- inherent and potential capability.

3. Acceptance Sampling

Purpose Acceptance by Attributes, single sampling plans. O.C. curve selection of sampling plans, Acceptance number, Type A and Type B O.C. curves. Double sampling plan and its analysis. Multiple and sequential sampling, A.O.Q.L. Acceptance sampling plans under risk. Design of various sampling plans, Dodge-Roming type system for acceptance sampling by attributes (use of various tables). Determination of process average. Acceptance sampling by variables.

4. Reliability

Control of reliability, factors affecting reliability, pattern of failure, mean time to failure. Fundamental of statistical concepts, consideration of reliability in series and parallel system, effect of redundancy and reliability, method of reliability evaluation, reliability optimization, Availability and Maintainability, means to improve reliability, reliability control during manufacture.

Reference and Text Books

1. Statistical Quality Control : By Grant and Leaven, Mc Graw-Hill
2. Quality Control and Reliability: By Mahajan, Dhanpat Rai
3. Quality Control : By Hansen, Prentice-Hall

B.Tech. (8th Semester) Mechanical Engineering
MET- 404 Power Plant Engineering

L	T	P/D	Total
3	1	-	4

1. Sources of Energy:

Conventional and non-conventional sources of energy; Importance of electrical energy; Geothermal power plants; Tidal power plants; Windmills; Solar power plants; Direct energy conversion systems; Energy from waste, Energy sources in India; Recent developments in power plants.

2. Hydro Power Plants:

Hydrology: rainfall, runoff, hydrographs, flow duration curves; Site selection for hydro power plants; Classification of hydro power plants; Storage type hydro power plant and its operation; Estimation of power availability; Selection of water turbines; Combination of hydro power plants with steam plants; advantages and disadvantages of hydro power plants.

3. Steam (Thermal) Power Plants:

Analysis of steam power cycles for power plant application; High pressure boilers- La-Mont boiler, Benson boiler, Loeffler boiler; Velox boiler; Super pressure steam power plants; Economizers; Air-preheaters; Super heaters and reheaters; Feed water heaters. General layout of thermal power plant; Site selection for thermal power plant; Coal as fuel, classification of coals, analysis of coal; Coal handling; Dead and live storage; Combustion of coal: coal burning methods, overfeed stokers, underfeed stokers, pulverized fuels and burners. Ash handling and disposal; Dust collectors. Heat balance sheet for thermal power plants.

4. Diesel Power Plants:

Introduction; Field of use; Outline of diesel electric power plant; Different systems of diesel power plant; Supercharging of diesel engine; Performance of diesel power plant; Advantages and disadvantages of diesel plants over thermal power plants.

5. Gas Turbine Plants:

Elements of plant, Thermal refinements, Performance of plants; Gas turbine characteristics; Comparison with other plants; Combined steam and gas turbine power plants.

6. Nuclear Power Plants:

Basic theory and terminology; Nuclear fission and fusion processes; Fission chain reaction; Moderation; Fertile materials; Nuclear fuels; General components of nuclear reactor; Different types of reactors; Breeder reactors; Nuclear power plants in India; Disposal of nuclear waste.

7. Fluctuating Loads on Power Plants:

Introduction; Load curves; Different terms and definitions; Effects of variable loads on power plant design and operation.

8. Economic Analysis of Power plants and Tariffs:

Cost of electrical energy; Selection of type of generation; selection of generating equipment; performance and operating characteristics of power plants; Load division among generators; Tariffs methods for electrical energy.

Reference and Text Books:

1. Power Plant Engineering
- By Morse
2. Power Plant Engineering
- By Dornkundwar
3. Power Plant Engineering
- By P.C. Sharma
4. Power Plant Technology
- By El-Wakil

B. Tech. 8th Semester (Mech. Engg.)**MET -406 : Work Study and Ergonomics**

L	T	P/D	Total
3	1	-	4

1. Introduction to Work Study:

Importance, Advantages, Techniques, work-study and management, work study and productivity.

2. Method - Study:

Definition and concept, Basic procedure, Factors affecting selection of the problems, Process chart symbols, Recording techniques (Charts and diagrams), Micro-motion studies, Therbligs, SIMO-chart, Principles of motion economy.

3. Work Measurement :

Introduction, objectives, Basic procedure, Techniques, Time study, Methods and Various allowances, work sampling technique, Performance rating and its determination, P.M.T.S., M.T.M., work-factor.

4. Ergonomics:

Introduction objectives, Man-machine system, three aspects of Man-machine system, Anthropometry & its importance, Human activities analysis, design of Man-machine systems, Design, types and selection of controls.

5. Maintenance Management:

Introduction, Scope of plant maintenance, Objectives, Functions, Areas of maintenance, Preventive maintenance, Corrective maintenance, Unplanned maintenance, Economic aspects, Total productive maintenance (TPM).

6. Material Management:

Introduction, Objectives, Function of purchasing and purchase organization, Purchase procedure and Methods of purchasing.

7. MRP and JIT Manufacturing:

MRP and its objectives, Benefits, Computer aided MRP, Some related JIT concepts used in MRP, JUST in Time definition, characteristics, introduction to TQM, Deming's approach to TQM.

Reference and Text Books:

1. Production Planning and Control : S. Eilon
2. Modern Production Management : S.S. Buffa
3. Industrial Engineering and Operations Management : S.K. Sharma & Savita Sharma
4. Industrial Engineering : B. Kumar
5. Work – Study and Ergonomics : S.K. Sharma & Savita Sharma

B.Tech. (Eighth Semester) Mechanical Engineering

MET - 477 Industrial Engineering and Organization

L	T	P/O	Total
4	1		5

1. Introduction:

Introduction to industrial engineering, techniques and application of industrial engineering Pioneers of Scientific Management.

2. Sales Forecasting:

Introduction, objectives and importance Methods: Collective opinion method, Economic indicator method, and regression analysis, moving average method, time series analysis, Numerical Problems.

3. Production Planning and Control:

Objectives, functions, preplanning and planning, routing, estimating, scheduling: master schedule, daily schedule, Gantt chart, dispatching, centralized vs. decentralized control, follow up and progress reporting.

4. Inventory control:

Introduction, functions, inventory control importance and functions, inventory costs, factors affecting inventory control, ABC analysis, simple inventory control model, Numerical Problems.

5. Inspection and Quality Control:

Inspection, definition, objectives and functions of inspection. Quality control definition and objectives, Difference between inspection and quality control. Statistical quality control, quality control charts Numerical problems.

6. Factory Organization:

Principles of organization, Primary and operating fundamentals of organization, type of organization, military or line organization, functional organization, line, staff and committee, type of organisation.

7. Work Study and work Measurement:

Definitions, objectives, purpose and scope, method study procedure, Time study, Objectives of work measurement Basic procedure for time study.

8. Product Design and Development:

Introduction, product developments, product characteristics, role of product development, 3-S (Standardization, simplification and specialization) Break even analysis. Numerical Problems.

9. Depreciation:

Introduction, Purpose of calculating Depreciation, Types. Methods of calculating depreciation. Numerical Problems.

Reference and Text Books:

1. Production planning and control
- By S. Eilon, Prentice Hall
2. Industrial Engineering and Management
- By Ravi Shankar, Gargota Publications
3. Introduction to Work study
- I.L.O.
4. Industrial Engg. & Operation Mgt.
BY S.K. Sharma & Savita Sharma

B.Tech. (Seventh Semester) Mechanical Engineering

MET-437 : MAINTENANCE ENGINEERING

L	T	P	Total
4	1		5

PART-A

UNIT -I : Introduction

Evolution of maintenance, objective of maintenance, maintenance policies and philosophies, maintenance concept, maintenance management & technology, relationship with other functional areas, importance of maintenance, elements of good maintenance, economics of maintenance, training and safety aspects in maintenance.

UNIT-II: Maintenance Strategies

Classification of maintenance programs, corrective, preventive and predictive maintenance, comparison of maintenance programs, preventive maintenance concept, functions, benefits, limitations.

UNIT-III: Condition Based Maintenance (CBM)

Objectives, what to monitor, when to monitor, principles of CBM, condition based maintenance techniques, manual inspections, performance monitoring, vibration monitoring, current monitoring, oil debris/spectroscopy, thermography and corrosion monitoring, steps in implementation of CBM, benefits of CBM.

UNIT-IV: Reliability Centred Maintenance (RCM)

RCM logic, maintenance and RCM, benefits of RCM, total productive maintenance (TPM), introduction, key supporting elements of TPM, methodology, evaluation and benefits.

PART -B

UNIT-V: Non-Destructive Testing (NDT)

Purpose and challenges: Techniques, visual aids-boroscopes, endoscopes, fiber optics scanners, magnetic particles inspection, liquid penetrants, eddy current, ultrasonic radiography, selection of NDT technique, merits/demerits and applications of various techniques.

UNIT-VI: Maintenance Planning and Control

Basic ingredients, basic steps in maintenance management, maintenance planning and control system, documentation, maintenance-productivity areas for improvement.

UNIT-VII: Reliability, Maintenance & Availability

Techniques for improvement of operational reliability, safety and availability of machines and production systems, maintainability

UNIT-VIII: Application of Computers to Maintenance Management

Data processing systems for integrated maintenance, maintenance information and reporting systems.

Text Books:

1. Maintenance Planning and Control by Higgin L.R., McGraw Hill Book Co., 1988.
2. Maintenance Planning and Control by Kelly Anthony, East West Press Private Ltd, New Delhi, 1991.
3. Maintainability principle and practices by Blanchard B.S. and Lowey E.E. Mc Graw Hill Book co.
4. Practical NDT by Raj B. Jaya Kumar T and Thavasimutyi K., Narora Publishing House, New Delhi, 1996.
5. Engineering Maintenance Management by Niebel Benjamin W, Marcel Dekker, 1994.

Note: In the semester examination, the examiner will set question paper in two parts. Part-A and Part-B. He will set eight questions in all (including four each part and one question from each unit. The students will be required to attempt only 5 questions taking at least two questions from each part.

M.TECH. MECHANICAL ENGINEERING

M- 615. Optimization Techniques

L	T	P/D
3	1	-

1. Introduction:

Need of optimization and historical development, engineering applications, classification and formulation of optimization problem.

2. Classical Optimization Techniques:

Single-variable and multi-variable optimization, with and without constraints, Kuhn-Tucker conditions.

3. Nonlinear Programming:

Introduction, One-dimensional optimization methods, unconstrained and constrained optimization techniques; elimination methods, exhaustive search, interval halving, Fibonacci, golden section methods; Random search methods, Hooke and Jeeves Method, Powell's method; Indirect search methods: steepest descent, Fletcher-Reeves, Newton's method, DFP, BFGS method; Internal and external penalty approach.

4. Other Optimization Techniques:

Introduction and basic concepts of Geometric Programming, dynamic programming, integer programming, stochastic programming, their applications.

5. Advance Topics in Optimization:

Multiobjective programming, introduction to Genetic algorithms, simulated annealing and ANN based optimization.

Reference and Text Books:

1. Engineering Optimization Theory and Practice
- By S.S. Rao, New Age International
2. Optimization for Engineering Design
- By Kalyanmoy Deb, PHI
3. Optimization Techniques
- By J.S. Arora, John Wiley

M.TECH. MECHANICAL ENGINEERING

M-620 Object Oriented Programming & Data Structure

L	T	P	D
3	1	-	

Basic concepts of object oriented programming (OOP), Benefits of OOP, Object oriented language, object oriented methods, object modeling techniques, Basic of C++, token, expressions and control structures, functions in C++, classes, object, constructors, destructors, operator overloading, type conversion, inheritance: extending classes, pointers, virtual functions, polymorphism, Files operations object oriented concepts in C++, object oriented systems development, Relational database management systems, open data base connecting.

Books Recommended:-

1. " Object Oriented Programming in C++", Lafuze.
2. " Fundamental of Data Structure in C++", Horowitz, Sahran.
3. " Data Structure in C++", Kuthi & Parthhye.
4. " Object Oriented Programming Fundamentals and applications ," Sengupta & Chaudhari.
5. " Programming in C++ ", Dewhurst & Sturk.
6. " Object Oriented Programming with C++ and Java", Samanta.
7. "C++ primer plus," Stephen Prata.
8. " Object Oriented Programming in C++", E. Balaguruswami.

M.TECH. MECHANICAL ENGINEERING

M-622. Computer Aided Design

L	T	P/D
3	1	-

1. **Introduction:**

Introduction, Review of vectors & Matrices, Basics of geometric and solid modeling, explicit, implicit, intrinsic and parametric equations, coordinate systems.

2. **Transformations:**

Introduction, transformation of points and line, 2-D translation, shearing, rotation, reflection, scaling and combined transformation, homogeneous coordinates, 3-D scaling, shearing, rotation, reflection and translation, combined transformations, orthographic, axonometric, oblique and perspective projections.

3. **Curves:**

Geometry and topology, algebraic and geometric forms of straight lines, circles, conics, cubic splines, Ferguson curve, Hermite curve, bezier curves and B-spline curves, NURBS, composite curves, tangents and normal, blending functions, reparametrization.

4. **Surfaces:**

Algebraic and geometric forms, tangents and twist vectors, normal, blending functions, reparametrization. Plane surface, sixteen point form, four curve form, ruled surface, surface of revolution, tabulated cylinder, lofted surface, bi-cubic surface, bezier surface, B-spline surfaces, Coons' patch, blending surface, offset surface, rational surface.

5. **Solids:**

Solid models and representation schemes, their properties, boundary representation, constructive solid geometry, sweep representation, cell decomposition, octree encoding, spatial occupancy enumeration.

6. **Analytical properties:**

Analytical properties (Intersection & development) of curves and surfaces.

Reference and Text Books:

- CAD/CAM - By Groover and Zimmer, Prentice Hall
- CAD/CAM: Theory and Practice - By I. Zeid, McGraw Hill
- Geometric Modeling - By M.E. Moenenson

M. TECH. MECHANICAL ENGINEERING**M-641 Computer Aided Manufacturing**

L	T	P/D
3	1	-

1. Introduction to Manufacturing

Basic definitions, design activities for manufacturing systems, Planning and control activities for manufacturing system, Manufacturing control, Types of production –low, Medium and high quantity production.

2. Group Technology and Cellular Manufacturing

Part families, parts classifications and coding, Production flow Analysis, cellular Manufacturing- composite part concept, machine cell design, applications of group technology, Grouping parts and machines by Rank order clustering technique, Arranging machines in a G.T. cell.

3. Process Planning

Introduction, Manual process planning, Computer aided process planning – variount , generative, Decision logic- decision tables, decision trees, Introduction to Artificial intelligence.

4. Flexible Manufacturing

Introduction, FMS components, Flexibility in Manufacturing – machine, Product, Routing, Operation, types of FMS, FMS layouts, FMS planning and control issues, deadlock in FMS , FMS benefits and applications.

5. CNC Basics and Part Programming

Introduction, Principle of CNC, Classification of CNC/NC – point to point and continuous path, positioning system- fixed zero and floating zero, Dimensioning- absolute and incremental, Coordinate system, Basic requirements of CNC machine control, CNC/NC words, Manual part programming, (G&M codes only) canned cycles, tool length and radius compensation.

References and Text Books

1. Automation, Productions systems and Computer - Integrated Manufacturing- BY M.P. Groover, Prentice – Hall
2. Computer Aided Manufacturing. BY Chang, Wang & WySK
3. Numerical Control and Computer – Aided Manufacturing By Kundra, Rao and Tiwari, Tata Mc Graw Hill.
4. International Journal of Production Research
5. International Journal of Flexible Manufacturing system.

M. TECH. MECHANICAL ENGINEERING
M-645 : THERMO FABRICATION

L T P D
3 1 - -

Classification

Arc welding processes: carbon arc welding; shielded metal arc welding; submerged arc welding; gas tungsten arc welding; gas metal arc welding; plasma arc welding; atomic hydrogen welding; stud welding; electroslag welding; electrogas welding. Resistance welding Processes: various techniques used in industry; Friction welding ultrasonic welding; diffusion welding; electron beam welding; laser welding; thermit welding; pressure and on-pressure type.

Arc Welding Power Sources:

Requirements for an arc welding power source; constant current characteristics; constant voltage characteristics, duty cycle. A.C. welding power source D.C. welding power sources.

Welding Electrodes:

Types of welding electrodes, electrode details, non consumable or refractory electrodes, consumable electrodes, light, medium and heavy coated electrodes, categories of coated electrodes, electrode coating ingredients and their functions, selection of electrodes, typical applications of covered electrodes.

Weldability and Welding of Various Metals:

Weldability of metals, effect of alloying element on weldability. Welding of cast iron, welding of carbon steels, welding of stainless steel, welding of aluminum and its alloys.

Estimation of Welding Costs:

Introduction, Main component costs of welding processes, factors involved in welding costs. Basic costing procedure for arc welding.

Foundry Mechanization:

Definition, advantages and disadvantages. Moulding machines, functions, advantages and disadvantages. Various types of moulding machines.

Principle of Gating:

Gating system, requirements, functions of gating system, pouring cups and basins, sprues, gates their characteristics and different types, design of gating system, defects occurring due to improper design of gating system.

Principle of Resering:

Functions of riser, types of risers, riser and directional solidification, design, general principle riser shape and size, riser location and riser feeding distance.

Defects in Castings & Special Casting Techniques:

Classification of defects, main types, their causes and remedies. Techniques of die casting centrifugal casting, investment casting their limitations advantages and disadvantages.

Books Recommended:

1. Principle of Foundry Technology by P.L. Jain
2. Fundamentals of Metal Casting by P.C. Mukherjee.
3. Foundry Engineering by Taylor Howard F.,
4. Welding and its applications by Rossi, B.E
5. Metallurgy of Welding by Lancaster J.F
6. Modern Welding Technology by Cary Howard B.,
7. Welding Processes and Technology by R.S. Parmar.

M. TECH. MECHANICAL ENGINEERING
M- 648 :Operations Management

L T P/D
 3 1 -

1. Types of production, Life cycle approach to production , Life cycle approach to production system, Productivity and Productivity measures, types of productivity index, productivity improvement, production scheduling , MRP V/s JIT, requirements and problems in implementing JIT, Benefits of JIT, Introduction to IT purchasing and JIT quality management, supply chain management, its importance, objectives and applications. Enabled supply chain supply chain drives concepts of stockless, VRM and CRM
2. Business process Re-engineering – characteristics, TR's , success factors and advantages.
3. ERP- characteristics, approaches, methodology for implementation, success factors.
4. Group Technology: Introduction, benefits of group, stages in G.T manufacturing benefits.

Reference & Text Books:

Operation Research : D.S. Hira & P.K. Gupta,
 Introduction to Operation Research: Hiller & Liebman

M. TECH. (MECH. ENGG.)
M- 649 Technology Management

L	T	P/D
3	1	-

Total Quality Management:

Introduction to TQM, implementing TQM promotion and action plan of TQM, TQM and improvement processes Policy promotion, tools and techniques for improvement, product quality and customer links, TQM and business cycles, education and training worker training, TQM policy and deployment guidelines, various case studies appraisal of TQM and improvement programmes reliability and reliability management.

Entrepreneurship:

Introduction to entrepreneurship, entrepreneurship development programmes, importance, EDC, strategies to become a successful entrepreneur, Government Policies, State of ED in India, Techno- economic feasibility, sources of finance, Costing, social Entrepreneurship and community development.

Ergonomics:

Concept of Ergonomics, importance and benefits of ergonomics.

Reference and Text Books:

1. Total Quality Management : Sunder Raju.
2. Strategic Entrepreneurship : P.K. Gupta.

M.TECH. MECHANICAL ENGINEERING

M -692: Machine Vision (theory)

Introduction

Machine vision, Elements of machine vision system, Basic relationship between pixels (Neighbors of a pixel, connectivity, Labeling of connected components, Distance measures).

Image Processing

Digitization, Noise, Introduction to spatial domain and frequency domain, Spatial filters (mean, median, gaussian smoothing filters, high pass filters), Image enhancement techniques (LUT, Histogram Equalization, Histogram specification, contrast stretching, intensity transformations).

Image Analysis

Segmentation of images, Techniques for detecting point, line, edges (Roberts, Prewitt, Sobel, Laplacian operations), Edge linking and boundary detection, Thresholding, Region oriented segmentation (Region growing by pixel aggregation, Region splitting and merging).

Description

Boundary Descriptions (Chain code, Signatures, Polygon approximation, shape numbers, Fourier descriptors) Regional descriptors-simple descriptors (Perimeter, area, minimum and maximum radii, no. of holes, corner, bending energy, compactness), Moment based descriptors (center of mass, bounding rectangle, Best fit ellipse, Eccentricity, moment invariants), Texture.

Pattern Recognition

Decision theoretic methods (Nearest neighbor classifier, Neural network), Structural methods, syntactic methods, Template matching.

References & Text Books

1. Digital image processing by Rafael C. Gonzalez and Richard E. Woods.
2. Fundamentals of Digital image processing by Anil K. Jain
3. Digital image processing-Concepts, Algorithms and Scientific Applications by Bernd Jahne
4. Machine vision by Ramesh Jain, Rangnchar Kasturi, Brian G. Schanck.

Item No. 5.9 To consider changes in the existing scheme of B.Tech. (Civil Engineering)

Following changes have been proposed in the existing scheme of B.Tech. (Civil Engineering). The changes have been necessitated due to the following reasons:

- (a) Practical Classes occurring prior to the theory classes.
- (b) Overloading of a particular laboratory during the odd semester.
- (c) Shortage of faculty in one semester (odd) thus requiring redistribution of teaching load to the other semester (even).
- (d) Redistribution of the credits of a subject (Para iv below) to accommodate the course on 'Seminar' during the 6th semester Campus placement commences w.e.f. 7th semester and so it has been felt that a seminar course prior to that will considerably help the students.
- (e) To broaden the domain of Departmental Elective subjects and the projects.

EXISTING		PROPOSED
i)	B.Tech. 3rd Sem: CET-211 Structural Mech. (Pr.) (2P)	B.Tech 4th Sem. Same Course & Subject (2 P)
ii)	B.Tech.4th Sem: CET-218 Engg. Geology(Pr.) (2P)	B.Tech 3rd Sem. Same Course & Subject (2 P)
iii)	B.Tech. 5th Sem: CET-313 Concrete Lab(Pr.) (2P)	B.Tech 6th Sem. Same Course & Subject (2 P)
iv)	B.Tech.6th Sem: CET-318, Computer Applications (3P)	B.Tech 5th Sem. Computer Applications (2 P)
		B.Tech. 6th Sem. Seminar (1 P)
v)	B.Tech. 7th sem. (a) Deptt. Elective- Specializations (i) Structures (ii) Soil (iii) Transportation	B.Tech. 7th sem. a) Deptt. Electives - All specializations (including Environmental & Water Resources)
	(b) Major Project (Transportation, Geotechnical & Environmental Engineering)	b) Minor Project All specializations including structures, Water Resources etc.
vi)	B.Tech. 8th Sem. (a) Deptt. Elective- Specialization (i) Water Resources (ii) Environmental	B.Tech. 8th Sem. a) Deptt. Electives - All specializations including structures, Soil and Transportation.
	(b) Major Project (Structures, Water Resources)	b) Major Project (all specializations)

The Senate may kindly consider and approve.

Item 5.10 : To consider restructuring of courses in the Department of Humanities

It is proposed that the paper of Industrial Sociology (HUT-211) for the 3rd/4th semester be offered as an optional paper (Open elective) in the 6th/8th semester. In its place, a paper on Organizational Behaviour be introduced in the 3rd/4th semester in **appendix-XI From page 124 to 125.**

The Senate may consider and approve.

DEPARTMENT OF HUMANITIES
NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA-136119.

No. Hum./05/99

Dated: 8.4.2005

MINUTES OF THE MEETING OF BOS IN HUMANITIES
HELD ON 2.4.2005

The meeting of the Board of Studies in Humanities, NIT, Kurukshetra, was held on 2.4.2005 at 11.30 am in the office of the Chairman.

The following attended the meeting:

- | | |
|--------------------------|-----------------|
| 1. Dr. Rajender Kumar | (In Chair) |
| 2. Dr. D K Nauriyal ✓ | External Expert |
| 3. Dr. Binayak Rath ✓ | External Expert |
| 4. Dr. K B Singh | Member |
| 5. Dr. P J Philip | Member |
| 6. Mrs. Manjula Sharma | Member |
| 7. Dr. Vikas Choudhary ✓ | Member |
| 8. Dr. Kiran Mor ✓ | Member |

The following decisions were taken:

- The recommendations of the DRC was considered and approved with the following changes:

- Out of the seven candidates, the cases of six were considered (Mr. Kapil Choudhary did not report). The case of Miss Bindu was turned down on the ground that she was interested in pursuing Ph.D. only if fellowship was granted to her. The following cases were recommended for registration:-

Sr. No.	Name of the Candidate	Name of the Tentative Topic	Name of the Supervisor
1.	Mrs. Manjula Sharma	Socio-cultural Context of Advertising Practices in Contemporary India	Dr. P J Philip
2.	Ms. Urvashi	Impact of WTO on Indian Agriculture	Dr. Rajender Kumar
3.	Mr. Abhishek Gupta	Employee Performance and Employee Satisfaction through Non-monetary Factors: A study of Selected Organizations	Dr. Rajender Kumar Dr. P J Philip

4.	Ms. Bhawna Saini	Impact of the New Economic Policies on Imports and Exports in India	Dr. Rajender Kumar Dr. P J Philip
5.	Ms. Mittu G. Matta	Consumer Behaviour in Shopping Malls: A Study of the NCR Region	Dr. Rajender Kumar Dr. P J Philip

2. The change of name of the Department from Humanities to Humanities and Social Sciences was strongly recommended in view of the fact that in all the IITs the name is Department of Humanities and Social Sciences.
 3. The following changes were made in the existing syllabi:
 - (i) As per the new scheme, the marks for sessional and theory for all the subjects have been changed to: **Sessional-50; Theory-50.**
 - (ii) It was recommended that the paper of Industrial Sociology (IUT-211) for 3rd/4th semester be offered as an optional paper in the 7th/8th semester. In its place, a paper on Organizational Behaviour be introduced in the 3rd/4th semester.
 4. It was recommended that the qualifying marks for registration of Ph.D. be 55% for all Humanities & Social Sciences subjects, as is the case in English, as per UGC norms.
- The meeting ended with a vote of thanks to the Chair.


 (Rajender Kumar)
 Chairman, BOS

Copy to:

1. All Members
2. Director, NITK
3. Dean, Academic

Item 5.11 : To consider the proposal of change of name of the Department of Humanities

The Institute has a Department of Humanities dealing with the subjects of Economics, Organizational Behaviour, Industrial Sociology, Business Management etc. besides English and Communication Skills. Therefore, it is proposed that the name of the **Department of Humanities** be changed to the **Department of Humanities and Social Sciences**. It is on the same pattern as that of the IIT's.

The Senate may consider and approve.

Item No. 5.12 To consider the criteria for awarding Merit Scholarship to 26 nos. students yearwise.

Since long 26 Nos. of students, yearwise have been granted Merit Scholarship on the basis of marks obtained in respective branches (Computer-3, Electronics-5, Mechanical-7, Electrical-6 & Civil-5). The value of Scholarship is Rs. 100/- per annum. A merit certificate is also awarded. Tuition fees, for the session is also refunded to the scholarship holders.

RECK has since been upgraded as National Institute of Technology, (Deemed University, Kurukshetra) w.e.f. 26.6.2002. The students admitted during 2003 are being governed by the new academic regulations approved by the Senate in its first meeting held in 16.4.2003.

The merit scholarship will be awarded to the students on the basis of academic performance as given below:

- i) For first year students - On the basis of SGPA of first semester.
- ii) For subsequent years (i.e. 2nd, 3rd & 4th years) - on the basis of CGPA of two preceding semester.

The concerned examinations should have been cleared in one attempt.

In case, there is a tie among the students, then exam. section will supply the marks along with grades of the effected students. If there is still a tie, then the grade/marks obtained in the one lower semester will be considered. Also, it is proposed to increase the number of scholarships in proportion to the strength of the Engineering discipline. The following table presents the existing and proposed allocation of number of scholarships:

Branch	Intake	Existing Number of Scholarships	Proposed Number of Scholarships
Computer	33	3	3
Electronics	66	5	7
Electrical	75	6	8
Civil	65	5	7
Mechanical	88	7	9
Total:	327	26	34

The Senate may consider and approve the above proposal of resolving the situation of tie.

Item No.5.13 To consider modifications in the present examination system.

Presently, the examinations are being conducted twice an year, at the end of each semester. The supplementary examinations (odd and even semesters) are already being held twice. This requires a long duration for conducting the examinations.

In order to cut down on the duration of the examination, it is proposed that supplementary examinations for the odd semester be held in December with regular semester examinations and those for the even semester be held in May with regular semester examinations.

Further, an exception to this may be the examination for B.Tech. 7th semester and 8th semester (all branches) who may be provided with an opportunity to appear for supplementary 7th semester alongwith 8th semester regular examination and 8th semester with 7th semester regular examination.

The Senate may consider and approve.

Item No. 5.14. To consider the departmentwise allocation of Ph. D. Scholarship through TEQIP.

Concise Institutional Proposal (CIP) of our Institute provides for 22 assistantship/fellowships through TEQIP of Doctoral Programmes (full time) @ Rs. 8000/- per month with an increment of Rs. 1000/- per year for each scholar alongwith a contingent grant of Rs. 10,000/- per year. Departmentwise distribution of scholarship is as follows:

Department	No. of Scholarship	Department	No. of Scholarship
Civil	3	Computer	2
Mechanical	3	Physics	2
Electrical	3	Chemistry	2
Electronics	3	Mathematics	2
-	-	Humanities	2

Senate may kindly approve.

The Senate may kindly note that this is in addition to the 25 Nos. Institute Scholarships (Passed vide Senate Agenda Item No. 4.5 Reference the BOG meeting held on 15.3.2003).

These has been allocated to different Departments by the Director as follows:

Institute Scholarship	Total =25
Engineering Departments	Minimum 3 each=15 +(1 to be decided by the Director)
Applied Sciences & Humanities Dept.	Minimum 2 each = 8 + (1 to be decided by the Director)

Item No. 5.15 To consider the eligibility for getting admission to Ph.D Programme and Scholarship

	Existing	Proposed Amendment
1.	<p>R 3.1. Educational Qualifications: An applicant possessing the following qualifications in appropriate areas shall be eligible to apply for admission for Ph.D. Programmes of the Institute.</p> <p>Master degree in an appropriate discipline or equivalent with a minimum Cumulative Grade Point Average (CGPA) of 6.75 on a 10 point scale or equivalent as determined by the Institute wherever Letter Grades are awarded; or 60% marks in aggregate (of all the years/semesters) where marks are awarded.</p>	<p>R 3.1 Educational Qualifications: An applicant falling in any of the following categories shall be eligible to apply for admission to Ph.D. Programmes of the Institute.</p> <p>a) Master's degree in Engineering/ Technology or M.Phil degree in Science/ Humanities or equivalent in relevant discipline with a minimum cumulative Grade Point Average (CGPA) of 6.75 on a 10-point scale or equivalent as determined by NIT, Kurukshetra wherever letter grades are awarded or 60% marks in aggregate (of all the years/semesters of the qualifying examination), wherever marks are awarded.</p> <p>(b) In exceptional cases, candidates with B.Tech. Degree or equivalent with excellent academic record (80% marks) may be considered eligible for admission provided they have also qualified GATE and possess a valid GATE score. Such a candidate has to compulsorily clear at least one semester course work of M. Tech. In relevant discipline as decided by DRC/ BOS.</p> <p>c) Candidates with M. Sc./M.A. or equivalent in respective Sciences and Humanities Discipline with good academic record (70% for sciences and 60% for Humanities) may also be considered eligible provided they have qualified any of the relevant national level examinations like UGC, CSIR, NET, ICAR etc. and possess a valid score to that effect.</p>

		d) Candidates having B. Tech./ M. Sc/ M.A. or equivalent with 70% marks for B. Tech./ M. Sc. and 60% marks for Humanities may be considered eligible for admission to Ph. D Programme even without GATE/UGC/CSIR/NET,ICAR etc. provided he/ she has at least 15 years experience in Govt. Organization/ Teaching/ Research.
2.	<p>Scholarship:</p> <p>Only the candidates passing through Graduate Aptitude Tests in Engineering (GATE) are eligible for Government scholarship.</p> <p>In 2002, the MHRD has raised the scholarship amount to Rs. 7000/- per month for M. Tech. Degree holders and Rs. 6000/- per month for B. Tech./ M. Sc. Degree holders, with increment of Rs. 500/- per annum. There shall be a contingency grant of Rs. 10,000/- per annum. Ph.D. Scholars should do around 8 to 10 hours of teaching per week.</p>	2. Scholarship:
3.	Last date of submission of application is 31 st August and 31 st January	The candidates admitted to Ph.D. Programmes under categories R.3.1. a), b), c), above will be eligible for the Institute/CIP Fellowship/Scholarship.
		In 2002, the MHRD has raised the scholarship amount to Rs. 7000/- per month for M. Tech. Degree holders and Rs. 6000/- per month for B. Tech./ M. Sc. Degree holders, with increment of Rs. 500/- per annum. There shall be a contingency grant of Rs. 10,000/- per annum. Ph.D. Scholars should do around 8 to 10 hours of teaching per week.
		Last date of submission of application is 31 st May and 30 th November of every calendar year.

Senate may consider and approve.

Item 5.16 - To consider changes in the 'Panel of Examiners' for evaluation of Ph.D. thesis.

In order to keep pace with the quality of research at the international level it is suggested that one of the examiners must be from outside India, from an advanced country. Also the examiners from within India should preferably be from IITs or institutes of equal repute.

The senate may consider and approve the following modifications:

Existing (Ordinance and Regulations for the Degree of Doctor of Philosophy, NIT, Kurukshetra)	Proposed modification
<p>R.11.3 Panel of Examiners: A panel of at least ten external experts in the area of the Ph.D. thesis would be suggested by the Supervisor(s) and recommended by the DRC while forwarding the title and synopsis of the thesis. The panel so recommended may include the examiners from outside India. The recommended panel will be considered and approved by BOS.</p>	<p>R.11.3 Panel of Examiners: A panel of at least ten external experts in the area of the Ph.D. thesis would be suggested by the Supervisor(s) and recommended by the DRC while forwarding the title and synopsis of the thesis. The panel so recommended will include at least five examiners from outside India, from advanced/developed countries and at least five from India, preferably from the IITs/Institutes of repute. The recommended panel will be considered and approved by BOS. The Director will select one examiner from outside India and one from India.</p>
<p>R. 12 Board of Examiners On receipt of the title and synopsis of the thesis, the Director will appoint a Board of Examiners for each candidate from the list</p>	<p>R. 12 Board of Examiners On receipt of the title and synopsis of the thesis, the Director will appoint a Board of Examiners for each candidate from the list</p>

approved by the BOS. The Board will consist of one internal examiner, normally the Supervisor as recommended by DRC & BOS and two external examiners, who shall be experts in the subject of the thesis. These external examiners shall be chosen normally from the panel of examiners recommended and approved by the DRC and BOS as aforesaid. A person working in the same laboratory (ies)/ Institution(s) where Research Candidate is employed cannot, however, be appointed as External Examiner for evaluating the Thesis of that Research Candidate. Further no person can be appointed as External Examiner from Laboratory/Institution to which the Co-Supervisor (s) of the Research candidate belongs.

approved by the BOS. The Board will consist of one internal examiner, normally the Supervisor as recommended by DRC & BOS and two external examiners, **one from within India and one from abroad**, who shall be experts in the subject of the thesis. These external examiners shall be chosen normally from the panel of examiners recommended and approved by the DRC and BOS as aforesaid. A person working in the same laboratory (ies)/ Institution(s) where Research Candidate is employed cannot, however, be appointed as External Examiner for evaluating the Thesis of that Research Candidate. Further no person can be appointed as External Examiner from Laboratory/Institution to which the Co-Supervisor (s) of the Research candidate belongs.

Senate may kindly approve.

Item No.5.17 **Regarding consolidating the information to be enshrined in the Ordinance of Studies for the Degree of Philosophy (Ph.D.) of our Institute.**

Right from the 1st meeting of the Senate, the Ordinance of Studies for the Degree of Philosophy (Ph.D.) of our Institute has been under modification. It is suggested that a committee on the issue be constituted which should consolidate all this information, analyses it and compile it as a complete and compatible document. The committee will present its report in the following meeting of the Senate for approval of the Senate.

It is proposed that a small committee comprising of 2-3 members with Dean (Academic Affairs) as the Co-ordinator be constituted for the aforesaid objective.

The Senate may consider this issue and approve.

Item No.5.18 To consider constitution of a 'Standing Committee on Senate Affairs' and its working thereof.

It has been felt that sometimes due to inadvertent long gaps in the meeting of the Senate, some issues pertaining to academic affairs get delayed. In order to avoid such delays, it is proposed that a 'Standing Committee on Senate Affairs' may be constituted. The committee on a referred issue will give its recommendations to the Director for his consideration. The constitution of the Standing Committee on Senate Affairs will be as follows:

- (i) All Deans (Senior-most Dean will be the Chairman of the Committee)
- (ii) Chairman/Chairmen of the concerned department(s). (Decision of the Concerned Department' will be of the Director)

Functioning of the Committee:

- (i) The Standing Committee on Senate Affairs will meet to decide on an issue that will be referred to it by the Director.
- (ii) The committee will give its recommendations to the Director for his consideration.
- (iii) The Director will then give the final decision on the matter.

The Director will report all such cases and the final decision/action thereof in the following meeting of the Senate.

The constitution of the Committee is within the powers of the Senate.

The Senate may consider and approve the matter.

Item 5.19 To consider the scheduling of meetings of the Senate

It is enshrined in the regulations of working of the senate that the Senate shall be required to meet four times in an year. Also majority of the academic matters and decisions are linked to their ratification by the Senate. This requires that there should be a calendar for the Senate meetings.

It is proposed that the senate shall meet on the last Saturday of the months of March, June, September and December of every calendar year.

This fixation of the schedule of the Senate is only for the preparedness of the meeting and the remaining formal procedure of notification of the meeting, circulation of the agenda etc. will remain unaltered.

The Chairman of the Senate may call for additional meetings or change the date of the meeting if the situation so warrants.

This matter is for consideration and approval of the Senate.

Item No. 5.20 **To note the appointment of three members as educationists of repute and six other members for their special knowledge, as members on the Senate, NIT Kurukshetra, for a period of 3 years.**

The Board of Governors in its 1st meeting held on 19.10.2002 vide Item No. 1.5 authorised the Chairman, BOG to approve nominees on the Senate viz. three persons not being employees of the Institute from amongst educationists of repute and six persons for their special knowledge. The three years term of members appointed with the approval of Chairman, BOG on the Senate had expired on 31.8.2005.

The Director and Chairman of the Senate put up a fresh panel of members proposed to be appointed against Constituency 5.1(e) and 5.1(f) for a period of three years w.e.f. 1.9.2005 to 31.8.2008 to the Chairman, Board of Governors for his approval. The Chairman, has approved the list of educationists and members for their special knowledge as under:

5.1(e) 3 members from amongst educationists of repute.

1. Prof. C.V. Ramakrishnan, Professor,
Department of Applied Mechanics,
Indian Institute of Technology, New Delhi.
2. Dr (Mrs) Retu Bhargava, Professor,
Civil Engineering Department,
Indian Institute of Roorkee, Roorkee (U.A.)
3. Dr. M.P. Kapoor,
'Shanti Niketan' H. No. 11,
Salaria Vihar, Army Welfare Housing Organization,
Radio Station Road, P.O. Punjabi University,
Patiala. 147002 (Punjab).

5.1(f) Six members for their special knowledge.

1. Prof. Sameresh Kar, Professor, Indian Institute of Technology, Kanpur. (UP)
2. Shri Ravi Jadika, President, Indian Sugar and General Engineering Corporation, Yamuna Nagar (Haryana).
3. Er. V.K. Sachdeva, Executive Director, The Saraswati Sugar Mills, Yamuna Nagar (Haryana).
4. Prof. K.R. Sharma, (Former Prof. & Head, EE Department, IIT Kanpur) Vice- President, Samtel Colour Ltd., Ghaziabad, UP.
5. Shri V.K. Raizada, (former Member Railway Board), Managing Director IRWO, 58, Rail Vihar, Sector 33, NOIDA. (UP).
6. Dr. A.K. Bhatnagar, Petrotech Chair Professor, Department of Chemical Engineering, Indian Institute of Technology, Hauz Khas, New Delhi. 110 016,

The concerned persons were informed about their nomination w.e.f. 1.9.2005 to 31.8.2008. The Senate may note the nominations of above members for a period of 3 years with effect from 1.9.2005.

- Item 5.21 To ratify the action taken by the Director and Chairman of the Senate for approving one expert nominee of the Senate on the Selection Committee for Faculty, non-teaching and scientific staff in the scale of post of Lecturer and above of NIT, Kurukshetra.

The Government of India in the Ministry of Human Resource Development vide their letter No. F-20-18/2003-TS.III dated 9th June, 2005 have re-constituted the Selection Committee for direct recruitment of faculty and including for grant of financial upgradation under CAS of NITs. The composition of the re-constituted selection committee is as under:

i)	Director of the NIT	Chairman
ii)	One nominee of UGC	Member
iii)	One nominee of AICTE	Member
iv)	Two experts to be nominated by the Board of Governors	Members
v)	One expert nominee of the Senate	Member
vi)	Head of the Department concerned.	Member

The composition of the re-constituted selection committee for faculty of NIT Kurukshetra has been approved by the Board of Governors in its 8th meeting held on 23.7.2005 (Item 8.12)

As regards one expert nominee of the Senate is concerned, the Director who is Chairman of the Senate has approved the name of Dr. C.V. Ramakrishnan, Professor, Department of Applied Mechanics, Indian Institute of Technology, New Delhi as expert nominee of the Senate in anticipation of the approval of Senate.

The matter is placed before the Senate to ratify the action taken by the Chairman Senate in recommending one expert nominee of the Senate on the Selection Committee for recruitment of faculty in NIT Kurukshetra as mentioned in para above. In addition he will also act as nominee of the Senate for non-teaching and scientific staff in the scale of the post of Lecturer and above.

Item 5.22 . To consider inviting the Officer Incharge (Academic Affairs) in the Senate meetings.

It was felt that there should be an Officer Incharge (Academic Affairs) who will also look after the Senate work. Dr. Baldev Setia, Asstt. Professor in Civil Engineering Department was deputed to work as Officer Incharge (Academic Affairs) in November, 2005. It has further been felt that the Officer Incharge (Academic Affairs) should participate in the deliberations of the Senate meetings so that the academic issues involved are discussed at length.

The Senate may consider and decide that the Officer Incharge (Academic Affairs) may participate in the Senate meetings as a Special Invitee.