NATIONAL INSTITUTE OF TECHNOLOGY KURUKSHETRA

AGENDA

For

26th MEETING OF SENATE

Venue of meeting Senate Hall, NIT, Kurukshetra

Date & Time 29th September, 2015 at 11.00 a.m.

NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA

Minutes of the 26th meeting of the Senate of National Institute of Technology, Kurukshetra held on 29.09.2015 at 11.00 a.m. in the Senate Hall of the Institute

The following were present:

1. Prof. Anand Mohan, Director & Hon'ble Chairman, Senate
2. Prof. (Ms.) Konduri Raja Rajeswari, External Member
3. Prof. Yashwant Singh, External Member
4. Prof. D.K. Nauriyal, External Member

Internal Members (Department & alphabetical order)

CIVIL ENGINEERING DEPARTMENT

1. Prof. Anupam Mittal, Professor
2. Prof. Arun Goel, Professor
3. Prof. Ashwani Jain, Professor
4. Prof. Baldev Setia, Professor
5. Prof. DK Soni, Professor
6. Prof. HK Sharma, Professor
7. Prof. KK Singh, Professor
8. Prof. Parveen Aggarwal, Professor
9. Prof. Saraswati Setia, Professor
10. Prof. SM Gupta, Professor
11. Prof. SN Sachdeva, Professor
12. Prof. Subodh Ranjan, Professor
13. Prof. Surinder Deswal, Professor
14. Prof. VK Sehgal, Professor
15. Prof. VP Singh, Professor

COMPUTER ENGINEERING DEPARTMENT

16. Prof. A. K. Singh, Professor
17. Prof. JK Chhabra, Professor
18. Prof. Mayank Dave, Professor
19. Prof. Sanjay Kumar Jain, Professor

CHEMISTRY DEPARTMENT

20. Prof. Dinesh Kumar, Professor
21. Prof. DP Singh, Professor
22. Prof. Minati Baral, Professor

COMPUTER APPLICATION DEPARTMENT

23. Prof. Ashutosh Kumar Singh, Professor

ELECTRICAL ENGINEERING DEPARTMENT

24. Prof. A. Swarup, Professor
25. Prof. Ashwani Kumar, Professor
26. Prof. GL Pahuja, Professor
27. Prof. Jagdeep Singh Lather, Professor
28. Prof. Jyoti Ohri, Professor
29. Prof. KS Sandhu, Professor
30. Prof. LM Saini, Professor
31. Prof. Ratna Dahiya, Professor
32. Prof. RS Bhatia, Professor
33. Prof. Sathans, Professor

ELECTRONICS & COMMUNICATION ENGINEERING DEPARTMENT

34. Prof. A.K. Gupta, Professor
35. Prof. Brahmjit Singh, Professor
36. Prof. OP Sahu, Professor
37. Prof. Rajoo Pandey, Professor
38. Prof. RK Sharma, Professor
39. Prof. Umesh Ghanekar, Professor

HUMANITIES AND SOCIAL SCIENCE DEPARTMENT

40. Prof. Kiran, Professor
41. Prof. Rajendra Kumar, Professor
42. Prof. Vikas Choudhary, Professor

MECHANICAL ENGINEERING DEPARTMENT

43. Prof. Ajai Jain, Professor
44. Prof. Dixit Garg, Professor
45. Prof Gian Bhushan, Professor
46. Prof. Hari Singh, Professor
47. Prof. PC Tewari, Professor
48. Prof. SS Rattan, Professor
49. Prof. Sudhir Kumar, Professor
50. Prof. Surjit Angra, Professor
51. Prof. VK Bajpai, Professor

MATHEMATICS DEPARTMENT

52. Prof. Paras Ram, Professor
53. Prof. A.S.V. Ravikanth, Associate Prof. & Head (Special Invitee)

PHYSICS DEPARTMENT

54. Prof. Ashavani Kumar, Professor

55. Prof. JK Quamara, Professor
56. Prof. Neena Jaggi, Professor

Coordinator, Special Group for Skill Development

57. Prof. P.J. Philip, Professor (Special Invitee)

Secretary, Senate

58. Sh. G.R Samantray, Registrar Incharge

The following members could not attend the meeting:

1. Dr. Subrata Sarkar, Special Invitee
2. Prof. Mahesh Pal
3. Prof. Ms. Pratibha Aggarwal
4. Prof. S.K. Madan
5. Prof. S.K. Patidar
6. Prof. V.K. Arora
7. Prof. Ms. Lillie Dewan
8. Prof. Yash Pal
9. Prof. Dinesh Khanduja (on long leave)
10. Prof. Pankaj Chandna

At the outset, Director and Chairman, Senate welcomed the members of the Senate and he specially welcomed the three External Senate members who have been nominated w. e. f. 04.09.2015. On behalf of the Senate, he also expressed gratitude to the former external members for their valuable suggestions during the senate meetings over the last three years. After this, Chairman permitted to present the agenda of the meeting for consideration of the Senate

The agenda was taken up and following decisions were taken in the meeting.

Item 26.1 To confirm the minutes of the 25th meeting of the Senate held on 24.02.2015.

The Senate, in its 25th meeting held on 24.02.2015 had confirmed the item numbers 25.5, 25.6, 25.9, 25.10, 25.22 and 25.23 during the meeting itself in view of the 12th convocation of the Institute. The minutes of the remaining items of 25th Senate meeting were confirmed by the Senate.

Item 26.2 To note the action taken on the minutes of the 25th meeting of the Senate held on 24.02.2015

The Senate noted the action taken on the minutes of the 25th meeting of the Senate held on 24.02.2015. However, the Senate expressed its concern over the items where required action had either not been initiated or not completed.

Senate resolved that Registrar Incharge and Member Secretary of the Senate will issue notifications / reminders regarding the committees constituted for different items of 25th meeting of the Senate. The Chairmen of the Committees were also requested to submit their reports within two weeks of the notifications.

Item 26.3 To confirm the minutes of 47th meeting of SCSA held on 17.07.2015.

The Senate noted the minutes of 47th meeting of SCSA held on 17.07.2015

Some members made an observation that the term 'to confirm' in the agenda item should be replaced by 'to note' Another suggestion given by one of the Senate members was that the important and urgent issues be approved by the Director and Chairman, Senate in anticipation of approval by the Senate.

Item 26.4 To note the admission status of various UG/PG programmes of the Institute for the academic session 2015-16.

The Senate noted the admission status of various UG / PG programmes of the Institute for the academic session 2015-16. However, the Senate expressed its concern over the admission status of Master of Business Administration. It was felt to emphasize on optimization of man-power and other resources in accordance with admitted students.

The Senate decided to constitute the following committee to review the admission status of MBA and make suitable recommendations to improve the admission status of the programme:

1. Prof. V. K Sehgal, Dean (P&D)

2. Prof. D. K. Nauriyal, Prof , IIT Roorkee
3. Head, Department of Business Administration, IIT Roorkee
4. One faculty member from MBA Department of the Institute (to be nominated by the Chairman Senate)

Item 26.5 To note the admission status of various UG programmes in the Indian Institute of Information Technology (IIIT) Sonepat for the academic session 2015-16.

The Senate noted the admission status of various UG programmes in the Indian Institute of Information Technology (IIIT) Sonepat for the academic session 2015-16.

Item 26.6 To note the summary of result of pass out students of UG / PG Programmes in May / June, 2015.

The Senate noted the summary of results of pass out students of UG / PG programmes in May / June, 2015 with the suggestion to provide the result analysis for the last three years.

Item 26.7 To approve the seat matrix of UG and PG Programmes under different categories for academic session 2016-17.

The Senate approved the seat matrix except for the M. Tech. Programme conducted by the Chemistry Department. Head of Department of Chemistry suggested that the name of M. Tech programme should be retained as originally proposed i.e. Molecular Engineering and Advanced Chemical Analysis instead of Molecular Engineering. In this regard, the Senate resolved that the Chairman Senate be requested to place the matter before the Board of Governors for its consideration.

Item 26.8 To note the approval of start of two new M. Tech. programmes offered by the Chemistry and Computer Engineering Department and consider minor changes in the nomenclature of M. Tech. programme of Chemistry Department.

The Senate noted the approval of Board of Governors for starting new M. Tech. programmes in Chemistry and Computer Engineering Departments.

There was an observation made by the HOD of Chemistry regarding the change in the nomenclature of M. Tech. programme of Department. The HoD asserted that modification of the title of the Program to

Molecular Engineering will leave little scope for the Chemistry Department It was decided that Head of Department will prepare the case and submit to the Chairman, Senate for consideration.

Item 26.9 To note the approval accorded by the Chairman, Senate for

(a) Amendment of R-7.2 Ph.D. regulation
(b) Minor Modification in Pre Ph.D scheme of Mathematics Department
(c) Scheme and Syllabi for M.Tech. Computer Engineering (Cyber Security).

The Senate noted the above approvals accorded by the Chairman, Senate.

Item 26.10 To approve revision in weightage of continuous evaluation components w. e. f. academic session 2015-16.

The Senate considered the case and approved the revision in the continuous evaluation components w. e. f. academic session 2015-16. The modified scheme is as given in the table below:

	SUB-COMPONENT	Weightage	
		Existing	Proposed
(a)	**Theory Papers**		
1	Two Mid Semester Exams.	10+10=20	15+15=30
2	Teacher's Assessment through viva-voce, Home Assignments, on the Spot tests, Short Quizzes etc.	10	10
3	Class Attendance (L+T)*	20	10
4	End Semester Examination	50	50
(b)	**For Practicals**		
1	Mid Semester Evaluation (to be conducted in regular Practical Classes)	20	30
2	Teacher's Assessment through viva-voce, lab. reports & class work etc.	20	20
3	Class Attendance*	20	10
4	End Semester Examination	40	40
(c)	For Seminars, Projects, Training, Comprehonsive viva and General Fitness evaluation, the weightage will be decided by Departmental Review/Academic Committees.		

* The maximum attendance for calculation of attendance component of sessional marks shall be 90% of the total classes held.

Item 26.11 To approve revision in fee refund norms for admission withdrawal / cancellation for session 2015-16 onwards.

The Senate approved the revision in fee refund norms for admission withdrawal / cancellation for session 2015-16 onwards.

Item 26.12 To approve revision in re-appear examination fee for the students who have completed their normal duration of studies.

The Senate deliberated upon the issue of examination fee for the reappear cases of students. The modified fee under this category will be as per the following table:

Sr. No.	Particulars of the Re-appear exam.	Existing Re- appear fee	Proposed Re- appear fee
1	Before 30 days of start of the Examination	1000/- Rs. Per Paper	1000/- Rs. Per Paper
2	Before 15 days of start of the Examination	1500/- Rs. Per Paper	1500/- Rs. Per Paper
3	Before 10 days of start of the Examination	2000/- Rs. Per Paper	2000/- Rs. Per Paper

Item 26.13 To approve revised syllabi of the courses offered by Department of Humanities and Social Sciences for B.Tech. programmes of the Institute.

The Senate considered the case and decided to:

a) approve the deletion of the course HUT-322, Soft Skill Workshop

b) approve the revised contact hours from the existing 2 (L), 2 (T) to 3(L), 1(T)

c) defer the item to Department to incorporate the soft spoken skills.

Some suggestions were given by one External member, Prof. D.K. Nauriyal that the course on 'Communication Skills in English' should include soft spoken skills, making use of the Language Lab. through related software. The model as adopted by IITR was also referred to.

In light of the above, Senate resolved that the Language Lab be made functional on priority basis and upgraded to host the requisite software.

Item 26.14 To consider modifications in Ph.D. ordinance.

The matter was considered and following committee was constituted to look into all cases of modifications in Ph.D. ordinance and bring it in the next senate meeting as an agenda item.

Dean (FW)	Chairman
Dean (Academic)	Member
Dean (R&C)	Member
Dean (SW)	Member

Item 26.15 To note the nomination of three educationists of repute as member on the Senate of the Institute.

Subsequent to the welcome of External Senate Members by the Chairman Senate, the Senate noted the nomination of following three educationists of repute as members on the Senate of the Institute:

1. Prof Konduri Raja Rajeswari
   (Former Professor & Head, Andhra Univ.)
   Professor, Department of Electronics & Comm. Engg. & Principal
   Viswanadha Institute of Technology and Management,
   Mindivanipalem Village, Anandhapuram Mandal
   Visakhapatnam-531 173

2. Prof. Yashwant Singh
   Distinguished Professor
   Department of Physics
   Banaras Hindu University
   Varanasi-221005

3. Prof. D. K. Nauriyal
   Deptt. of Humanities & Social Science & Dean (Students' Welfare)
   Indian Institute of Technology Roorkee
   Roorkee-247 667

Item 26.16 To note the approval of Board of Governors for increasing the number of Ph. D. Scholarships in each department of the Institute.

The Senate noted the approval of Board of Governors for increasing the number of Ph. D. scholarships in each department of the Institute

Item 26.17 To note the approval of Ministry of Human Resource Development, Govt. of India regarding uniformity in duration for payment of fellowship to all research scholars.

The Senate noted the approval of Ministry of Human Resource Development, Govt. of India regarding uniformity in duration of payment of fellowship to all research scholars

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

Registrar Incharge &
Secretary, Senate

Dean (Academic)

Director & Chairman, Senate

NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA-136119

INDEX

Item 26.1 **To confirm the minutes of the 25th meeting of the Senate held on 24.02.2015.**

The minutes of the 25th meeting of the Senate held on 24.02.2015 was circulated to all the members of the Senate on 27.02.2015. The minutes are enclosed as Annexure 26.1(A) from pages **02** to **14**

The observation of one Senate member on 25th Senate meeting, approval of Chairperson BOG on the minutes of 25th meeting of the Senate on 05.03.2015, are attached as Annexure 26.1 (B) from page **15**.

The Senate may kindly confirm the minutes of 25th meeting of Senate held on 24.02.2015.

MINUTES

OF 25th SENATE MEETING

NATIONAL INSTITUTE OF TECHNOLOGY KURUKSHETRA

HELD ON: 24th February, 2015

2

NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA-136119

Minutes of the 25th meeting of the Senate of National Institute of Technology, Kurukshetra held on 24.02.2015 at 11.00 a.m. in the Senate Hall of the Institute.

The following were present:

1. Prof. Anand Mohan, Director & Hon'ble Chairman, Senate

2. Prof. (Ms.) Shashikala Achyut Gangal, External Member

Internal Members (Department & alphabetical order)

Civil Engineering Department

1. Prof. Anupam Mittal
2. Prof. Ashwani Jain
3. Prof. Baldev Setia
4. Prof. DK Soni
5. Prof. Parveen Aggarwal
6. Prof. Paratibha Aggarwal
7. Prof Saraswati Setia
8. Prof SKMadan
9. Prof. SK Patidar
10. Prof. SM Gupta
11. Prof. Subodh Ranjan
12. Prof. Surinder Deswal
13. Prof. VK Sehgal
14. Prof. VP Singh

Computer Engineering Department

15. Prof. AK Singh
16. Prof. JK Chhabra
17. Prof. Mayank Dave
18. Prof. SK Jain

Chemistry Department

19. Prof. Dinesh Kumar
20. Prof. DP Singh
21. Prof. Minati Baral

Computer Application Department

22. Prof. Ashutosh Kumar Singh

3

Electrical Engineering Department

23. Prof. A Swarup
24. Prof. Ashwani Kumar
25. Prof. GL Pahuja
26. Prof. JS Lather
27. Prof. Jyoti Ohri
28. Prof. KS Sandhu
29. Prof. Lillie Dewan
30. Prof. LM Saini
31. Prof. Ratna Dahiya
32. Prof. RS Bhatia
33. Prof. Sathans
34. Prof. Yash Pal

Electronics & Communication Engineering Department

35. Prof. AK Gupta
36. Prof. Brahmjit Singh
37. Prof. OP Sahu
38. Prof. Rajoo Pandey
39. Prof. Umesh Ghanekar

Humanities and Social Science Department

40. Prof. Kiran
41. Prof. PJ Philip
42. Prof. Rajendra Kumar
43. Prof. Vikas Choudhary

Mechanical Engineering Department

44. Prof. Ajai Jain
45. Prof. Dixit Garg
46. Prof. Gian Bhushan
47. Prof. PC Tewari
48. Prof. SS Rattan
49. Prof. Sudhir Kumar
50. Prof. Surjit Angra
51. Prof. VK Bajpai

Mathematics Department

52. Prof. Paras Ram

Physics Department

53. Prof Ashavani Kumar
54. Prof. JK Quamara
55. Prof. Neena Jaggi

Secretary, Senate

Dr. Shyam Narayan, Registrar & Secretary, Senate

The following members could not attend the meeting:

External Members

Sr. No.	Name of the Senator (s)
1.	Dr. Chandra Shekhar
2.	Prof. Rajendra Rai

Internal Members (Department & alphabetical order)

Civil Engineering Department

3.	Prof. Arun Goel
4.	Prof. HK Sharma
5.	Prof. KK Singh
6.	Prof. Mahesh Pal
7.	Prof. SN Sachdeva
8.	Prof. VK Arora

Electronics & Communication Engineering Department

9.	Prof. RK Sharma

Mechanical Engineering Department

10.	Prof. Dinesh Khanduja
11.	Prof. Hari Singh
12	Prof. Pankaj Chandna

At the outset, Registrar & Secretary, Senate welcomed the members and sought the permission of the Chair to present the agenda of the meeting for consideration of the Senate.

Before the first item on the agenda could be presented, there was an observation by one member Prof. S. Angra, followed by a few others regarding the notice period required for circulation of the agenda and the low frequency of meetings of the Senate. The Chairman, Senate permitted the members to express the opinion on these observations. He agreed that the delay in the conduct of the meeting was circumstantial; however, emergent and essential issues of Institute have been timely addressed by Dean (Academic) and the Chairman, Senate. The Chairman Senate further assured that effort shall be made to organize regular meetings of the Senate in future.

The agenda was taken up and following decisions were taken in the meeting.

Item 25.1 To confirm the minutes of the 23rd meeting and to note the minutes of 24th meeting of the Senate held on 13.12.2013 and 18.02.2014 respectively.

The Senate confirmed the minutes of 23rd meeting of the Senate held on 13.12.2013. Some points were raised by the Senate members on the agenda item regarding the confirmation of the minutes of 24th meeting of the Senate held on 18.02.2014. Some members were of the view that the minutes have to be confirmed by Senate. The Chairman, Senate explained the circumstances under which the minutes of the 24th meeting had been approved by the Hon'ble Chairperson, BOG. The 24th Senate meeting was held on 18th Feb. 2014 and the Convocation was due on 6th March 2014. Therefore, there was no option but to get the minutes approved by Hon'ble Chairperson, BOG. The entire issue including 39 observations of the Senators was subsequently placed as an agenda item in the 33rd meeting of the BOG held on 04.6.2014 wherein the BoG reaffirmed the approval of the Hon'ble Chairperson.

The minutes of the 24th Senate meeting were noted by the Senate.

Item 25.2(a) To note action taken on the minutes of the 23rd meeting of the Senate held on 13.12.2013.

The Senate noted the action taken on the minutes of the 23rd meeting of the Senate held on 13.12.2013.

Item 25.2(b) To note action taken on the minutes of the 24th meeting of the Senate held on 18.02.2014.

The Senate noted the action taken on the minutes of the 24th meeting of the Senate held on 18.02.2014.

Regarding the item no. 24.1, after the ruling of the Chairman of the Senate, no further action was required on this item.

It was decided to request the committee *'looking into the functioning of SCSA'* to expedite submission of its report.

Regarding the item no. 24.4, the committee looking into the aspect of *'improving the soft skills of PG students'* submitted its report and the same was appended along with the table agenda for consideration of the Senate.

Item 25.3 To note the admission status of various UG, PG & Ph.D. Courses in the Institute for the academic session 2014-15.

The Senate noted the admission status of UG, PG and Ph.D. Courses in the Institute for the academic session 2014-15. However, there were a few suggestions as follows:

i. Names of Departments should be in alphabetical order.

ii. In the Postgraduate category, number of columns should be increased to include seats under sponsored category and TEQIP, separately.

iii. Admissions under Ph. D. should be further detailed to include candidates with and without scholarship.

Concern was also expressed regarding low admission status in the Department of Business Administration for the MBA programme.

Item 25.4 To note the admission status of various UG Courses in the Indian Institute of Information Technology (IIIT) Kilohard, Sonepat for the academic session 2014-15.

The Senate noted the admission status of various UG Courses in the Indian Institute of Information Technology (IIIT) Kilohard, Sonepat for the academic session 2014-15.

Item 25.5 To approve the list of the students to be awarded degrees in the 12th Convocation of the Institute.

The Senate approved the lists of the students to be awarded their respective degrees of Ph. D., M. Tech., MBA, MCA and B. Tech. These degrees are to be conferred upon the awardees on the occasion of 12th Convocation of the Institute scheduled on 26th March 2015. The Senate was informed that the lists would be available on the Institute website. The

7

students, HoDs, and faculty members were requested to bring any discrepancy in the lists to the notice of the Academic Section for due modification. Further, these lists will be sent to the respective Departments to facilitate pointing out of discrepancies, if any. All such observations received up to Monday, March 09, 2015 after due verification will accordingly be incorporated in the degree certificates. It was also resolved that some more students who become eligible for award of degrees on or before Wednesday, the 18th March, 2015 will also be added to the existing lists after due approval of Chairman, Senate. The Senate confirmed the minutes of this agenda.

Item 25.6 To approve the names of students to be awarded Medals and Academic Prizes.

The Senate approved the names of students to be awarded medals and academic prizes. The date of correction of any discrepancy will be 9th March 2015. The Senate confirmed the minutes of this agenda.

Item 25.7 To report the pass percentage of students during academic year 2013-14.

The Senate noted the pass percentage of students during academic year 2013-14 and expressed concern over the low pass percentage in some of the M. Tech. programmes i.e. ECE and VLSI Design. It was felt that presentation of data in the present form does not reveal and reflect much of the progressive performance. Therefore, the results should be analysed for a period of preceding four years and preferably presented in the form of bar charts.

Item 25.8 To report the campus placement status during academic year 2013-14.

The Senate noted the information provided by Professor Incharge (Training & Placement). Here also, it was observed by the Senators that the tabular form of presentation of placement records is not fully reflective of the placement scenario in the Institute. It should be duly analysed, well detailed and presented in the form of bar charts. Further, a presentation

should be made by Professor Incharge (Training & Placement) highlighting the placement status.

The external member suggested that a compulsory non-credit course for improving communication skills of the students should be introduced in the Institute, especially at the postgraduate level. Following committee was constituted to look into the modalities of this non-credit course:

1. Dr. Baldev Setia, Dean (Academic)
2. Dr. P.J. Philip, Dean (Students Welfare)
3 Dr. Mayank Dave, Dean (R&C)

Item 25.9 To approve degree format for M. Tech. programme offered by School of VLSI design and Embedded Systems, School of Renewable Energy & Efficiency, School of Biomedical Engineering & School of Material Science and Nanotechnology.

The Senate considered the proposed degree certificate format for the four schools and approved the same with minor modifications / corrections in the degree format. Regarding the basic lay out and aesthetics of the format, Prof. Surender Deswal was requested to assist Dean (Academic) for its finalization in consultation with the Chairman, Senate The Senate confirmed the minutes of this agenda.

Item 25.10 To approve correction in degree format for MBA programme offered by Department of Business Administration.

The Senate approved the degree format with minor modification / correction. The Senate confirmed the minutes of this agenda.

Item 25.11 To note the approval of the Chairman, Senate to the proposal of

(i) Starting of an M. Tech. program in Molecular Engineering and Advanced Chemical Analysis.
(ii) Revision of Scheme and syllabi of Ph. D.
(iii) Revision of course codes for B. Tech. course offered by Chemistry Department.

(i) The Senate noted the approval of Chairman, Senate to start M. Tech. program in '*Molecular Engineering and Advanced Chemical Analysis*' in the Chemistry Department.

(ii) The Senate noted the revision of scheme and syllabi of Ph. D. of Chemistry Department. An observation was made regarding the course code allotted to the course on Research Methodology which was being run by different departments under different course codes A committee consisting of following was constituted to look into this aspect:

1 HODs of Chemistry & Business Administration
2. Prof. Lillie Dewan, Prof. Elect. Engg. Deptt.
3. Prof. Ashwani Jain. Prof. Civil Engg. Deptt.

(iii) The Senate noted the revision of course codes for B. Tech. courses offered by Chemistry Department.

Item 25.12 To note the approval of the Chairman, Senate for creation of more scholarships for each Department for Ph. D. students.

The Senate noted the proposal for creation of more scholarships for Ph. D. students. The total number of scholarships for Engineering Department was revised to 40 per year. The external Senate member suggested that those Ph. D (Full Time) students, who are not getting scholarships, should be given some stipend by the Institute.

The Chairman, Senate further informed that this proposal of the Senate will be put before the Finance Committee and Board of Governors for its consideration.

Item 25.13 To consider and approve

(i) Start of Pre-Ph. D. course in the Department of Business Administration

(ii) Revision in syllabi for MBA programme from 2015-16 session onwards

(iii) Change in Admission Criterion for admission in MBA programme from 2015-16

(iv) To introduce one additional specialization of Operation Management

The Senate considered and approved the above agenda item except the item at sr. no. (iii). For (iii), It was resolved to continue with the existing admission criterion for admission in MBA programme for the year 2015-16. However, a Committee of the following was constituted to look into and review the criterion suggested by the department.

(1) Prof. P J. Philip, Dean (SW)
(2) HOD, Business Administration
(3) One expert from MDI, Gurgaon to be suggested by Prof. P. J. Philip

Item 25.14 To consider the fee relaxation for internal faculty (Ph.D.) students.

The Senate considered the proposal which was duly deliberated upon. However, the proposal could not be acceded to

Item 25.15 To consider and approve

(i) Model framework from 3rd Semester onwards for revising the scheme of B. Tech. Computer Engineering and B.Tech. Information Technology
(ii) Revision of Scheme of Syllabi M.Tech. Computer Engineering from 2015-16
(iii) To start M. Tech. program in Cyber Security w.e.f. 2015-16

(i) Though the Senate welcomed the need and suggestion for revising the scheme of B. Tech. Computer Engineering and B. Tech. Information Technology, yet in order to have a uniform change / revision for all departments, it was felt necessary to conduct this exercise for all departments. To look into the model framework and give recommendations thereupon, a committee of the following was constituted:

1. Prof. A. Swarup, Dean (FW)
2. Prof. Baldev Setia, Dean (Acad.)
3. Prof. J K Chhabra, Prof. Computer Engg.
4. Prof. Ashwani Sharma, Prof. Elect. Engg.
5. Dy. Registrar (Acad.) - Secretary

(ii) The revised Scheme and syllabi of M. Tech. Computer Engineering was approved by the Senate to be implemented w.e f. 2015-16

(iii) The Senate welcomed and agreed in principle to start M. Tech programme in *'Cyber Security'* from session 2015-16. The department will propose the scheme and syllabi for the programme to the Senate for approval.

Item 25.16 To consider and approve minor amendment in attendance benefit norms.

The Senate considered and approved the proposal.

Item 25.17 To note the approval given by Chairman Senate for registration process after 4th Semester for submission of dissertation in respect of M. Tech. programme.

The Senate noted the approval given by Chairman, Senate.

Item 25.18 To report the approval accorded by the Hon'ble Chairperson, Board of Governors.

The Senate noted the approval accorded by the Hon'ble Chairperson, Board of Governors regarding appointments of HoDs of Chemistry and Computer Engg. Departments.

Item 25.19 To consider and decide the nomination of one Professor as Senate nominee on the Board of Governors, NIT Kurukshetra.

After deliberations, it was decided to nominate the senior most Professor next to the outgoing Senate nominee on the Board of Governors.

Since there was an apparent ambiguity in the next senior most Professor, it was deemed fit to suggest preparation and circulation of seniority list of the Institute. For this purpose, a Committee under the chairmanship of Dean (P&D) comprising of members- Prof. S. Deswal, Prof. in Civil Engg. Deptt. and Registrar was constituted to scrutinize the seniority list. The seniority list will be prepared and circulated.

For this item, the Senate authorized the Chairman, Senate to nominate senior most Professor next to the outgoing Senate nominee on the Board of Governors.

Item 25.20 To consider and approve the Panel of Expert Nominee of Senate from outside the Institute on the Selection Committees for recruitment of Academic Staff.

It was informed by the Chairman, Senate that the lists of panel of expert nominees of Senate on the Selection Committee of Academic staff were incomplete / not well distributed across the country. Therefore the Senate decided to give 15 days time to all Heads of Departments to review and do the necessary modifications of lists of expert nominees. Thereafter, the Chairman, Senate was authorised to approve the same.

TABLE AGENDA

Item 25.21 To facilitate pursuing of M. Tech. in the Institute for regular employees of the Institute as Part-time candidate.

The item was deliberated upon in light of the proposed modification. However, the members were of the opinion that M Tech. Part-time does not ensure quality and hence decided to do away with M. Tech. Part-time programme. In the light of this decision, the Clause 6 (ii) of the Prospectus for admission to M. Tech. Program stands deleted.

Item 25.22 To consider conferment of Honorary Degree of D. Sc. *(Honoris Causa)* on Padmashree Dr. Sanjay Govind Dhande, former Director of Indian Institute of Technology (IIT) Kanpur, innovative technologist, an acclaimed academician and eminent researcher.

The Senate approved the conferment of Honorary Degree of D. Sc. *(Honoris Causa)* on Padmashree Prof. Sanjay Govind Dhande, former Director of Indian Institute of Technology (IIT) Kanpur, innovative technologist, an acclaimed academician and eminent researcher. The Senate confirmed the minutes of this agenda.

Item 25.23 To consider conferment of Honorary Degree of D. Sc. *(Honoris Causa)* on Padmashree Prof. Pritam Singh, an eminent academician and researcher as well as apex policy

maker of Government of India for promotion of higher education.

The Senate approved the conferment of Honorary Degree of D. Sc. *(Honoris Causa)* on Padmashree Prof. Pritam Singh, an eminent academician and researcher as well as apex policy maker of Government of India for promotion of higher education. The Senate confirmed the minutes of this agenda.

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

22.1.15

(Shyam Narayan)
Registrar & Secretary, Senate
NIT Kurukshetra

27.12.2015

(Baldev Setia)
Dean (Academic)
NIT, Kurukshetra

(Anand Mohan) 27/12/15
Director & Chairman, Senate
NIT, Kurukshetra

ANNEXURE-26.1 (B)

NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA

No. Acad./15/1009 **Dated:27.2.2015**

Subject To approve the minutes of 25th meeting of Senate held on 24.02.2015.

Respected Sir,

The 12th Convocation of the Institute is scheduled to be held on 26th March, 2015. Therefore, a list of students eligible for the award of various degree/medals was approved by the Senate in its 25th meeting held on 24.02.2015. The minutes of the Senate meeting are enclosed as Annexure-A.

The Senate also considered the agenda items and approved to confer D.Sc (Honoris Causa) Degree to the following in recognition of their outstanding contribution in their respective fields:

1. *Padmashree Prof. Sanjay Govind Dhande, former Director of Indian Institute of Technology (IIT) Kanpur, innovative technologist, an acclaimed academician and eminent researcher.*

2. *Padmashree Prof. Pritam Singh an eminent academician and researcher as well as apex policy maker of Government of India for promotion of higher education.*

As per 1st Statutes under NIT Act, 2007, the approval of Senate and Board is necessary for the conferment of degrees. The Senate has already approved the list of degree recipients. Since the next meeting of the Board is not expected to be held before 26th March,2015, therefore, it is requested that Hon'ble Chairperson, BOG may kindly approve the minutes of 25th Senate so that degrees to be awarded may be got printed for the ensuing 12th Convocation.

The matter will be reported to the Board in its next meeting.

DIRECTOR 27/2/15

The Hon'ble Chairperson
Board of Governors
NIT, Kurukshetra

27.02.15

27/2/15

5/3/15

Dean (Acad.)

13/3/15

13/03/15

Item 26.2 To note the action taken on the minutes of the 25th meeting of the Senate held on 24.02.2015.

The action taken on the minutes of the 25th meetings of the Senate held on 24.02.2015 is as under:-

Item No.	Agenda Item	Minutes of the Item	Action Taken
25.1	**To confirm the minutes of the 23rd meeting and to note the minutes of 24th meeting of the Senate held on 13.12.2013 and 18.02.2014 respectively.**	The Senate confirmed the minutes of 23rd meeting of the Senate held on 13.12.2013. Some points were raised by the Senate members on the agenda item regarding the confirmation of the minutes of 24th meeting of the Senate held on 18.02.2014. Some members were of the view that the minutes have to be confirmed by Senate. The Chairman, Senate explained the circumstances under which the minutes of the 24th meeting had been approved by the Hon'ble Chairperson, BOG. The 24th Senate meeting was held on 18th Feb. 2014 and the Convocation was due on 6th March 2014. Therefore, there was no option but to get the minutes approved by Hon'ble Chairperson, BOG. The entire issue including 39 observations of the Senators was subsequently placed as an agenda item in the 33rd meeting of the BOG held on 04.6.2014 wherein the BoG reaffirmed the approval of the Hon'ble Chairperson. The minutes of the 24th Senate meeting were noted by the Senate.	23rd Meeting Minutes were confirmed by the Senate and 24th Meeting Minutes noted by the Senate after reaffirmation of the approval of Chairman, BOG on the minutes by the Board. No further action is required in this regard.
25.2(a)	**To note action taken on the minutes of the 23rd meeting of the Senate held on 13.12.2013.**	The Senate noted the action taken on the minutes of the 23rd meeting of the Senate held on 13.12.2013.	No further action is required
25.2(b)	**To note action taken on the minutes of the 24th meeting of the Senate held on 18.02.2014.**	The Senate noted the action taken on the minutes of the 24th meeting of the Senate held on 18.02.2014 Regarding the item no. 24.1, after the ruling of the Chairman of the Senate, no further action was required on this item. It was decided to request the committee *'looking into the functioning of SCSA'* to expedite submission of its report. Regarding the item no. 24.4 the committee looking into the aspect of *'improving the soft skills of PG students'* submitted its report and the same was appended	No further action is required.

		along with the table agenda for consideration of the Senate.	
25.3	**To note the admission status of various UG, PG & Ph.D. Courses in the Institute for the academic session 2014-15.**	The Senate noted the admission status of UG, PG and Ph.D. Courses in the Institute for the academic session 2014-15. However, there were a few suggestions as follows: i. Names of Departments should be in alphabetical order. ii. In the Postgraduate category, number of columns should be increased to include seats under sponsored category and TEQIP, separately. iii. Admissions under Ph. D. should be further detailed to include candidates with and without scholarship. Concern was also expressed regarding low admission status in the Department of Business Administration for the MBA programme.	Suggestions of the Senate have been noted and will be complied in future
25.4	**To note the admission status of various UG Courses in the Indian Institute of Information Technology (IIIT) Kilohard, Sonepat for the academic session 2014-15.**	The Senate noted the admission status of various UG Courses in the Indian Institute of Information Technology (IIIT) Kilohard, Sonepat for the academic session 2014-15.	The Senate noted the Admission status in the IIIT Sonepat. No further Action is required
25.5	**To approve the list of the students to be awarded degrees in the 12th Convocation of the Institute.**	The Senate approved the lists of the students to be awarded their respective degrees of Ph. D., M. Tech., MBA, MCA and B. Tech. These degrees are to be conferred upon the awardees on the occasion of 12th Convocation of the Institute scheduled on 26th March 2015. The Senate was informed that the lists would be available on the Institute website. The students, HoDs, and faculty members were requested to bring any discrepancy in the lists to the notice of the Academic Section for due modification. Further, these lists will be sent to the respective Departments to facilitate pointing out of discrepancies, if any. All such observations received up to Monday, March 09, 2015 after due verification will accordingly be incorporated in the degree certificates. It was also resolved that some more students who become eligible for award of degrees on or before Wednesday, the 18th March, 2015 will also be added to the existing lists after due approval of Chairman, Senate. The Senate confirmed the minutes of this agenda.	The students have been awarded degrees in the 12th Convocation of the Institute held on 26th March, 2015 Total 1174 (656 B.Tech, 327 M.Tech, 67 MBA, 87 MCA and 37 Ph.D.) students have been awarded degree in the Annual Convocation. No further action is required.

25.6	**To approve the names of students to be awarded Medals and Academic Prizes.**	The Senate approved the names of students to be awarded medals and academic prizes. The date of correction of any discrepancy will be 9th March 2015. The Senate confirmed the minutes of this agenda	The students have been awarded medals in the 12th Convocation held on 26th March, 2015 No further action is required in this regard.
25.7	**To report the pass percentage of students during academic year 2013-14.**	The Senate noted the pass percentage of students during academic year 2013-14 and expressed concern over the low pass percentage in some of the M. Tech programmes i.e. ECE and VLSI Design. It was felt that presentation of data in the present form does not reveal and reflect much of the progressive performance. Therefore, the results should be analysed for a period of preceding four years and preferably presented in the form of bar charts.	Observation of the Senate is noted for further compliance in this regard in future. The COE will be informed to prepare the result analysis as desired by the Senate for Academic Session 2015-16 in the next Senate Meeting related to this agenda item.
25.8	**To report the campus placement status during academic year 2013-14.**	The Senate noted the information provided by Professor Incharge (Training & Placement). Here also, it was observed by the Senators that the tabular form of presentation of placement records is not fully reflective of the placement scenario in the Institute. It should be duly analysed, well detailed and presented in the form of bar charts. Further, a presentation should be made by Professor Incharge (Training & Placement) highlighting the placement status. The external member suggested that a compulsory non-credit course for improving communication skills of the students should be introduced in the Institute, especially at the postgraduate level. Following committee was constituted to look into the modalities of this non-credit course: 1. Dr. Baldev Setia, Dean (Academic) 2. Dr. P.J. Philip, Dean (Students Welfare) 3. Dr. Mayank Dave, Dean (R&C)	Observation of the Senate is noted for further compliance in this regard in future. The Professor I/C (Training and Placement) will be informed to prepare the presentation as desired by the Senate for Academic Session 2015-16 in the next Senate Meeting related to this agenda item. In this regard, view of the Professor I/C Training & Placement is placed before Senate under Agenda Item No. 25.1. Notification of the committee to introduce non-credit courses will be done soon.
25.9	**To approve degree format for M. Tech. programme offered by School of VLSI design and Embedded Systems, School of Renewable Energy & Efficiency, School of Biomedical Engineering &**	The Senate considered the proposed degree certificate format for the four schools and approved the same with minor modifications / corrections in the degree format. Regarding the basic lay out and aesthetics of the format, Prof. Surender Deswal was requested to assist Dean (Academic) for its finalization in consultation with the Chairman, Senate. The Senate confirmed the minutes of this	The students were awarded degrees in the approved format

	School of Material Science and Nanotechnology.	agenda	
25.10	**To approve correction in degree format for MBA programme offered by Department of Business Administration.**	The Senate approved the degree format with minor modification / correction. The Senate confirmed the minutes of this agenda	The students were awarded degrees in the revised format. No further action is required in this regard
25.11	**To note the approval of the Chairman, Senate to the proposal of** **(i) Starting of an M. Tech. program in Molecular Engineering and Advanced Chemical Analysis.** **(ii) Revision of Scheme and syllabi of Ph. D.** **(iii) Revision of course codes for B. Tech. course offered by Chemistry Department.**	(i) The Senate noted the approval of Chairman, Senate to start M. Tech program in *'Molecular Engineering and Advanced Chemical Analysis'* in the Chemistry Department. (ii) The Senate noted the revision of scheme and syllabi of Ph. D of Chemistry Department. An observation was made regarding the course code allotted to the course on Research Methodology which was being run by different departments under different course codes. A committee consisting of following was constituted to look into this aspect: 1. HODs of Chemistry & Business Administration 2 Prof. Lillie Dewan, Prof. Elect. Engg. Deptt. 3 Prof. Ashwani Jain, Prof. Civil Engg. Deptt (iii) The Senate noted the revision of course codes for B. Tech. courses offered by Chemistry Department.	Agenda items in this regard are sent to the Board in its 35th Meeting held on 08.05.2015(35.13 and 35.14). The Board approved to start both the new M.Tech programmes from Academic Session 2015-16 onwards The Board also desired to change the name of the M.Tech programme offered by Chemistry from M.Tech(Molecular Engineering and Advanced Chemical Analysis) to M.Tech(Molecular Engineering) The Board also resolved that the syllabus content be modified accordingly An agenda is prepared on the observation of the Board in this regard for noting and consideration of the Senate in 26th Meeting vide agenda item no. 26.9
25.12	**To note the approval of the Chairman, Senate for creation of more scholarships for each Department for Ph. D. students.**	The Senate noted the proposal for creation of more scholarships for Ph. D. students. The total number of scholarships for Engineering Department was revised to 40 per year. The external Senate member suggested that those Ph. D (Full Time) students, who are not getting scholarships, should be given some stipend by the Institute. The Chairman, Senate further informed that this proposal of the Senate will be put before the Finance Committee and Board of Governors for its consideration.	An agenda item in this regard is sent in the 31st Finance Committee meeting scheduled on 08.05.2015 for consideration of the FC and BOG. The minutes of the meeting is awaited in this regard
25.13	**To consider and approve** **(i) Start of Pre-Ph. D. course in the Department of Business Administration** **(ii) Revision in syllabi for MBA**	The Senate considered and approved the above agenda item except the item at sr. no. (iii) For (iii), it was resolved to continue with the existing admission criterion for	The department started offering Pre-Ph.D. courses to its Ph.D. students admitted from Even Semester-2014-15 Revised syllabi for MBA programme

	programme from 2015-16 session onwards **(iii) Change in Admission Criterion for admission in MBA programme from 2015-16** **(iv) To introduce one additional specialization of Operation Management**	admission in MBA programme for the year 2015-16. However, a Committee of the following was constituted to look into and review the criterion suggested by the department (1) Prof. P.J. Philip, Dean (SW) (2) HOD, Business Admin-stration (3) One expert from MDI, Gurgaon to be suggested by Prof P J Philip	is offered to the students admitted in w.e.f 2015-16 session. The committee is yet to submit its report in this regard
25.14	**To consider the fee relaxation for internal faculty (Ph.D.) students.**	The Senate considered the proposal which was duly deliberated upon However, the proposal could not be acceded to.	The decision of the Senate is noted No further action is required in this regard.
25.15	**To consider and approve** **(i) Model framework from 3rd Semester onwards for revising the scheme of B. Tech. Computer Engineering and B.Tech. Information Technology** **(ii) Revision of Scheme of Syllabi M.Tech. Computer Engineering from 2015-16** **(iii) To start M. Tech. program in Cyber Security w.e.f. 2015-16**	(i) Though the Senate welcomed the need and suggestion for revising the scheme of B Tech. Computer Engineering and B Tech. Information Technology, yet in order to have a uniform change / revision for all departments, it was felt necessary to conduct this exercise for all departments. To look into the model framework and give recommendations thereupon, a committee of the following was constituted. 1. Prof. A. Swarup, Dean (HW) 2. Prof. Baldev Setia, Dean (Acad.) 3. Prof. J K Chhabra, Prof Computer Engg. 4. Prof. Ashwani Sharma, Prof. Elect Engg. 5. Dy. Registrar (Acad.) - Secretary (ii) The revised Scheme and syllabi of M Tech. Computer Engineering was approved by the Senate to be implemented w.e.f. 2015-16. (iv) The Senate welcomed and agreed in principle to start M. Tech. programme in 'Cyber Security' from session 2015-16 The department will propose the scheme and syllabi for the programme to the Senate for approval.	The report from the committee is yet to be received on the uniformity /change in the scheme and syllabi for all B.Tech programmes of the Institute. The department started teaching learning process for the M.Tech (Computer Engineering) batch admitted in Academic Session 2015-16 The department started the M.Tech in Cyber Security and named this programme as M Tech Computer Engineering (Cyber Security) The scheme and syllabi approved by the Chairman, Senate is placed for noting of the Senate in 26th Senate meeting vide agenda item no 26.8(c)
25.16	**To consider and approve minor amendment in attendance benefit norms.**	The Senate considered and approved the proposal	Amended attendance norms have been followed by the Teaching Department and at the Academic Section No further action is required in this

			regard
25.17	**To note the approval given by Chairman Senate for registration process after 4th Semester for submission of dissertation in respect of M. Tech. programme.**	The Senate noted the approval given by Chairman, Senate.	Registration process after 4th Semester has been started from Academic Session 2014-15 onwards. No further action is required in this regard
25.18	**To report the approval accorded by the Hon'ble Chairperson, Board of Governors**	The Senate noted the approval accorded by the Hon'ble Chairperson, Board of Governors regarding appointments of HoDs of Chemistry and Computer Engg. Departments.	No further action is required in this regard.
25.19	**To consider and decide the nomination of one Professor as Senate nominee on the Board of Governors, NIT Kurukshetra.**	After deliberations, it was decided to nominate the senior most Professors next to the outgoing Senate nominee on the Board of Governors. Since there was an apparent ambiguity in the next senior most Professor, it was deemed fit to suggest preparation and circulation of seniority list of the Institute. For this purpose, a Committee under the chairmanship of Dean (P&D) comprising of members- Prof. S. Deswal, Prof. in Civil Engg. Deptt. and Registrar was constituted to scrutinize the seniority list. The seniority list will be prepared and circulated. For this item, the Senate authorized the Chairman, Senate to nominate senior most Professor next to the outgoing Senate nominee on the Board of Governors.	A letter in this regard by the Registrar is sent to the members and the seniority list is still to be received from the Committee.
25.20	**To consider and approve the Panel of Expert Nominee of Senate from outside the Institute on the Selection Committees for recruitment of Academic Staff.**	It was informed by the Chairman, Senate that the lists of panel of expert nominees of Senate on the Selection Committee of Academic staff were incomplete / not well distributed across the country. Therefore the Senate decided to give 15 days time to all Heads of Departments to review and do the necessary modifications of lists of expert nominees. Thereafter, the Chairman, Senate was authorised to approve the same	The Chairman, Senate have approved the lists of the experts as submitted by the respective HODs. No further action is required in this regard.
Table Agenda			
25.21	**To facilitate pursuing of M. Tech. in the Institute for**	The item was deliberated upon in light of the proposed modification. However,	The decision of the Senate is implemented w.e.f 2015-16 session.

	regular employees of the Institute as Part-time candidate.	the members were of the opinion that M. Tech. Part-time does not ensure quality and hence decided to do away with M. Tech. Part-time programme. In the light of this decision, the Clause 6 (ii) of the Prospectus for admission to M. Tech Program stands deleted	Part Time M.tech is discontinued from 2015-16 session. No further action is required in this regard.
25.22	**To consider conferment of Honorary Degree of D. Sc. *(Honoris Causa)* on Padmashree Dr. Sanjay Govind Dhande, former Director of Indian Institute of Technology (IIT) Kanpur, innovative technologist, an acclaimed academician and eminent researcher.**	The Senate approved the conferment of Honorary Degree of D. Sc. *(Honoris Causa)* on Padmashree Prof. Sanjay Govind Dhande, former Director of Indian Institute of Technology (IIT) Kanpur, innovative technologist, an acclaimed academician and eminent researcher. The Senate confirmed the minutes of this agenda.	Conferred Honorary Degree of D. Sc. *(Honoris Causa)* on Padmashree Prof. Sanjay Govind Dhande, former Director of Indian Institute of Technology (IIT) Kanpur, innovative technologist, an acclaimed academician and eminent researchor in the 12th Convocation of the Institute held on 26th March,2015
25.23	**To consider conferment of Honorary Degree of D. Sc. *(Honoris Causa)* on Padmashree Prof. Pritam Singh, an eminent academician and researcher as well as apex policy maker of Government of India for promotion of higher education.**	The Senate approved the conferment of Honorary Degree of D. Sc. *(Honoris Causa)* on Padmashree Prof. Pritam Singh, an eminent academician and researcher as well as apex policy maker of Government of India for promotion of higher education. The Senate confirmed the minutes of this agenda.	Conferred Honorary Degree of D. Sc. *(Honoris Causa)* on Padmashree Prof. Pritam Singh, an eminent academician and researcher as well as apex policy maker of Government of India for promotion of higher education in the 12th Convocation of the Institute held on 26th March,2015

The Senate may kindly note the action taken on the minutes of the 25thc Senate meeting held on 24.02.2015.

Item 26.3 To conform the minutes of 47th meeting of SCSA held on 17.07.2015.

47th meetings of the Standing Committee on Senate Affairs (SCSA) was held on 17.07.2015 at 4.00 in the Board Room of the Golden Jubilee Administrative Building. The minutes of the meeting have already been circulated to all members of SCSA on 04.08.2015. The minutes are enclosed as Annexure 26.3 from pages **23** to **28**.

The Senate may kindly confirm the minutes of 47th SCSA meeting held on 17.07.2015.

ANNEXURE-26.3

NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA

No. Acad /2015/47[th] SCSA/ Dated:17 7 2015

Subject: Minutes of the 47[th] SCSA meeting held on 17.7.2015 at 4.00 p.m. in Board Room of the Golden Jubilee Administrative Building.

The following were present:

1	Prof. Anand Mohan, Director	In Chair
2.	Dr V K. Sehgal, Dean (P&D)	
3.	Dr. Baldev Setia, Dean (Academic)	
4	Dr Mayank Dave, Dean (R&C)	
5.	Dr. S K Madan, HOD, CED	
6.	Dr. G.L. Pahuja, HOD, EED	
7.	Dr. Dixit Garg, HOD, MED	
8.	Dr. Rajoo Pandey, HOD, ECE	
9.	Dr. A.K. Singh, HOD, Computer Engg. Deptt.	
10.	Dr ASV Ravikanth, HOD, Mathe. & P/I (Acad)	
11.	Dr. Vikas Choudhary, HOD, Hum.	
12.	Dr. D.P. Singh, HOD. Chemistry	
13.	Dr. Ashvani Kumar, HOD. Physics	
14.	Dr. Ashutosh Kumar Singh HOD. MCA	
15.	Dr. Rajender Kumar, HOD, MBA	
16	Dr. R.P. Chauhan. COE	
17.	Sh. G R. Samantaray, Registrar Incharge & Secretary	

At the outset, the Director welcomed all the members of SCSA and mentioned that although he wanted to have a Senate meeting during April / May, 2015, however, due to academic load on teachers in the concluding phase of the even semester followed by examinations and then summer vacation, the meeting could not be organized. He subsequently mentioned that there were certain urgent matters for consideration and therefore this SCSA meeting has been called.Thereafter, the agenda was taken up and item wise following decisions were taken.

Item 47.1: To consider the extension of duration of Ph. D. beyond the normal period of seven years

The requests of following four Ph. D. scholars for extension in duration of Ph. D. beyond the normal period of seven years was considered by the SCSA. After a detailed deliberation on the each case individually, the SCSA decided as indicated against each candidate:

1. Sh. Vijay Kumar Tayal	The HoD of Electrical Engineering Department informed the SCSA that the Ph. D. thesis of the candidate was ready for submission. Therefore the SCSA decided that, as a special case, the candidate be allowed extension to submit his Ph. D. thesis by the end of August, 2015.
2. Sh. Ashish Jasuja	The SCSA considered and recommended that the candidate be given time to submit his Ph. D. thesis by October, 2015.
3. Sh. Saurabh Srivastava	The HoD of Electronics & Communication Engineering Department informed the SCSA that the supervisor of the candidate was not satisfied with the readiness of the Ph. D. thesis. Therefore, the SCSA recommended that the matter be referred back to the DRC of the Department for consideration and forwarding its specific recommendations.
4. Mrs. Vrinda Gupta	The SCSA considered the matter and allowed the candidate to submit her thesis by 6th March 2016 i.e. the maximum period of 8 years.

Item 47.2 To consider and approve the interchange of subjects in the School of Renewable Energy and Efficiency

The SCSA considered the case of interchange of the two courses as proposed by the DAC of the School as shown below:

Existing	Proposed
SRE 501T Solar Energy Systems	SRE 502T Heat Transfer
SRE 502T Heat Transfer	SRE 501T Solar Energy Systems

The SCSA approved the proposal of the School of Renewable Energy and Efficiency for interchange of the subjects.

Item 47.3 To consider granting permission to M. Tech. students to join a job, who get a job opportunity during the course of study

The issue of granting permission to M. Tech. students to take up employment during the course of pursuing M. Tech. was deliberated in detail. The SCSA considered the case and granted permission to M. Tech students to join the job after completion of one year of M. Tech. studies as regular student subject to the following conditions that.

(i) The student must have completed Semester I and II without any backlog.

(ii) The students under category (i) above will have to come back to complete their M. Tech. Semester III and IV contiguously within the maximum program duration of 5 years.

(iii) No student shall be allowed to join Private Limited Companies.

(iv) The students who join jobs with permission will be required to deposit a nominal registration fee of Rs. 1000/- per semester during the period of absence from the Institute.

Item 47.4 To consider the requests of students for Special Examinations

The SCSA considered and accepted the requests of students for special examinations with the following conditions:

(i) The students of 2011-15 Batch who have got a job but have 'one backlog' in any semester are allowed to appear in special reappear examinations.

(ii) The students of 2007 Batch who are completing the maximum period of eight years but are having back-log in one course of any semester are allowed to appear in special reappear examinations.

Item 47.5 To consider providing an opportunity to a student, Mr. Jiwant Singh to appear in an examination where the date sheet had been advanced

The SCSA considered the request of Mr. Jiwant Singh, a student of B. Tech. (ECE) batch 2010-14 and allowed him to appear for 6th semester supplementary exam of Digital Communication

The SCSA further resolved that the Controller of Examination be requested to ensure that the proposed date sheet of examination is not up-load on the Institute website.

Item 47.6 To apprise the SCSA of Global Initiative of Academic Networks (GIAN)

The SCSA accepted the scheme of Global Initiative of Academic Networks (GIAN) with its objective and long and short term goals. The SCSA resolved that the information of GIAN be circulated to all Heads of Departments for discussion in the faculty meeting and to explore the possibilities for preparing project proposals for onward transmission to the Ministry.

Item 47.7 Any other item

Under any other item, the Dean (Academic) apprised the SCSA about the status of M. Tech. and B. Tech. Counseling currently in progress in the Institute. He further proposed an eight-digit code for roll numbers to be allotted to the students w. e. f. session 2015-16 which was deliberated and approved by SCSA.

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

Registrar and Secretary, Senate

Dean (Academic)
17.07.15

Director
17/7/15

The SCSA further resolved that the Controller of Examination be requested to ensure that the proposed date sheet of examination is not up-load on the Institute website.

Item 47.6 To apprise the SCSA of Global Initiative of Academic Networks (GIAN)

The SCSA accepted the scheme of Global Initiative of Academic Networks (GIAN) with its objective and long and short term goals. The SCSA resolved that the information of GIAN be circulated to all Heads of Departments for discussion in the faculty meeting and to explore the possibilities for preparing project proposals for onward transmission to the Ministry.

Item 47.7 Any other item

Under any other item, the Dean (Academic) apprised the SCSA about the status of M. Tech. and B. Tech. Counseling currently in progress in the Institute. He further proposed an eight-digit code for roll numbers to be allotted to the students w. e. f. session 2015-16 which was deliberated and approved by SCSA.

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

Registrar and Secretary, Senate

Dean (Academic)
17.07.15

Director
17/7/15

Item 26.4 **To note the admission status of various UG/PG Programmes of the Institute for the academic session 2015-16.**

The Institute is offering various Undergraduate and Postgraduate Programmes in addition to research leading to Degree of Doctor of Philosophy in various disciplines of Engineering & Technology and Sciences. At present the Institute is running 07 B. Tech., 22 M. Tech., 01 MBA, 01 MCA programs in addition to Ph. D. programs. The admission status of various UG, PG and Ph. D Courses for the academic session 2015-16 is as under:

A. Undergraduate (B. Tech.)

Sr. No.	Name of Programmes	Sanctioned Intake	Admitted candidates JoSAA-2015/ CSAB-2015	Sanctioned Intake DASA/MEA/ICCR	Admitted		
					DASA*	ICCR**	MEA***
1.	Civil Engineering	140	140	Supernumerary seats @ 15% max of Total Intake (i.e.832 = 125)	0	9	1
2.	Computer Engineering	92	89		14	3	1
3.	Electrical Engineering	140	135		0	8	1
4.	Electronics & Communication Engg.	138	135		0	2	1
5.	Information Technology	92	91		8	2	0
6.	Mechanical Engineering	138	138		6	3	1
7.	Production & Industrial Engineering	92	85		0	0	0
	Total	832	813	125	28	27	5

Grand Total - 813+28+27+5= 873

*Direct Student Admission Abroad(DASA)-2015 is co-ordinated by MNIT, Jaipur

**Indian Council for Cultural Relations(ICCR) sponsored admissions.

***Ministry of External Affairs (MEA sanctioned admissions.

There is no separate Seat Matrix approved for DASA/ICCR and MEA categories.

B. (1) Postgraduate (MBA/MCA):

Sr. No.	Department	Name of Programme	Regular Intake	Regular Admitted	Self Financed Intake	Self Financed Admitted
1.	Business Administration	Master of Business Administration	60	33	30	13
2.	Computer Applications	Master of Computer Applications	60	58	30	27

B. (2) Postgraduate (M. Tech.):

Sr. No	Department	Name of Programme	CCMT-2015/Spot Counseling		Sponsored Category		DASA/ICCR/ MEA	Total
			Sanctioned Intake	Admitted candidates	Sanctioned Intake	Admitted candidates	Admitted candidates#	
1.	Chemistry	Molecular Engineering and Advanced Chemical Analysis*	20	06	05	00	00	06
2.	Civil Engineering	Environmental Engineering	21	19	05	01	01	21
		Soil Mech Foundation Engg.	18	17	05	00	00	17
		Structural Engg.	19	19	05	00	05	24
		Transportation Engg	18	18	05	00	01	19
		Water Resource Engineering	17	15	05	00	01	16
3.	Computer Engg.	Computer Engg.	25	25	05	00	00	25
		Cyber Security *	20	18	05	01	00	19
4.	Electrical Engineering	Control System	20	20	05	00	00	20
		Power Electronics & Drives	20	20	05	00	00	20
		Power System	20	18	05	01	00	18
5.	Electronics & Comm. Engg.	Electronics & Comm Engg.	24	21	05	00	00	21
6.	Mechanical Engineering	Industrial Production Engg.	20	19	05	01	00	20
		Machine Design	20	19	05	02	00	21
		Thermal Engineering	24	24	05	00	00	24
7.	Physics	Instrumentation	20	17	05	00	00	17
		Nanotechnology	20	16	05	00	00	16
8.	School of Biomedical Engg.	Biomedical Engineering	20	13	05	00	00	13
9.	School of Material Science and Nanotechnology	Material Science and Nanotechnology	20	15	05	00	00	15
10.	School of Renewable Energy & Efficiency	Renewable Energy Systems	20	18	05	00	00	18
11.	School of VLSI Design & Embedded System	Embedded System Design	20	18	05	00	00	18
		VLSI Design	32	31	05	00	00	31
		Total	458	406	110	06	06	420

* New Admissions w.e.f. academic session 2015-16

Supernumerary seats under DASA/ICCR/MEA this is maximum of 15% of approved intake 458 =92 Seats

At present there is no such bifurcation is approved by the Senate.

8 Students admitted under ICCR Category only on the supernumerary seats

C. Ph D Registration status for registrations during even semester of 2014-15.

Sr. No.	Name of departments	Number of candidates registered for Ph.D.		
		Full-time	Part time	Total
1.	Business Administration	02	00	02
2.	Chemistry	04	00	04
3.	Civil	08	01	09
4.	Computer Applications	00	01	01
5.	Computer Engg.	02	00	02
6	Electrical Engg.	02	04	06
7.	Electronics & Comm.	02	00	02
8.	Humanities & SS	00	01	01
9.	Mathematics	02	00	02
10.	Mechanical Engg.	04	10	14
11.	Physics	02	00	02
12.	School of Renewable Energy & Efficiency	00	04	04
	Grand Total	28	21	49

The Senate may kindly note

a) The admission status for the session academic session 2015-16 for various UG,PG programmes

b) Registration status of Ph.D. scholars during even semester of academic session 2014-15.

Item 26.5 **To note the admission status of various UG Programmes in the Indian Institute of Information Technology (IIIT) Sonepat for the academic session 2015-16.**

To address the challenges faced by the Indian IT industry and growth of domestic IT market, it has been decided by the Ministry of Human Resource Development, Govt. of India to set up 20 new IIIT's in the Country in PPP mode. The main objective in establishment of IIITs has been to set up a model of education which can produce world class human resources in IT and for harnessing the multi dimensional facets of IT in various domains. One such IIIT has been setup in Haryana at village Kilohard, district Sonepat.

Our Institute is mentoring the Indian Institute of Information Technology (IIIT), Kilohard, Sonepat w.e.f. Academic Session 2014-15 for undergraduate courses in the domains of IT and allied areas.

The undergraduate courses, sanctioned intake and students admitted during 2015-16 are being presented in the table given below. This is second batch of IIIT Sonepat:-

Sr. No	Name of Course	Sanctioned Intake	Admitted candidates
1.	Computer Science & Engineering	30	27
2.	Information Technology	30	24
3.	Electronics & Communication Engineering	30	22
Total		90	73

The Senate may kindly note the admission status of various UG programmes of IIIT Sonepat Institute for the academic session 2015-16.

Item 26.6 To note the summary of result of pass out students of UG/PG Programmes in May/June, 2015 examinations.

In May/June, 2015 examinations, the result summary of final year students of various UG/PG programmes is summarized as below

Sr. No.	UG Programmes	Appeared in Exam	Pass out in May/June,2015 Exams	Pass %
1	Civil Engineering	122	81	66.39
2	Computer Engineering	94	72	76.60
3	Electrical Engineering	139	108	77.70
4	Electronics & Comm. Engineering	124	96	77.42
5	Industrial Engineering & Management	66	41	62.12
6	Information Technology	68	53	77.94
7	Mechanical Engineering	138	101	73.18
	Total	751	**552**	73.50
Sr. No.	**PG Programmes**	**Appeared in Exam**	**Pass out in May/June,2015 Exams**	**Pass %**
1	MBA	55	35	63.64
2	MCA	82	81	98.76
3(a)	M.Tech (Course work result up to 2nd Sem)	340	311	91.47
3(b)	M.Tech (Dissertation submitted by 30.06.2015)		161	53.24
3(c)	M.Tech (Dissertation submitted by 15.09.2015)		298	87.65
3(d)	**M.Tech (Out of 298 students)**	208	208	100.00
	Total*	**137**	**116**	84.67^

Specialization wise result analysis of M.Tech students will be placed as table agenda.

^ Excluding M.Tech results.

The Senate may kindly note the results of UG and PG students during May/June, 2015 examination.

Item 26.7 To approve the seat matrix of UG and PG Programmes under different categories for academic session 2016-17.

The Institute offers admissions on seats of various UG and PG programmes as per the admission norms of the centralized admission agency dully appointed by Government of India for uniform admissions across all NIT's of the country. The Institute offers admissions in MBA programme as per the Institute norm.

The Seat Matrix for various UG and PG Programmes of the Institute for proposed admission in academic session 2015-16 may be given as below:

(a) UG Programmes (B.Tech.)

1) Through Centralized admission agency (JOSAA/CSAB)

(I) NIT, Kurukshetra

Seat Matrix for admission to B.Tech. programmes (2016-17)

	B.Tech Programmes	OP	OP PH	SC	SC PH	ST	ST PH	OBC	OBC PH	TOTAL
Home State Quota (50%)	Civil Engg.	34	1	10	1	5	0	19	0	70
	Computer Engg.	23	1	7	0	3	0	12	0	46
	Electrical Engg.	34	1	10	1	5	0	18	1	70
	Electronics & Comm. Engg.	33	1	10	0	5	1	18	1	69
	Information Technology	23	1	7	0	3	0	12	0	46
	Production & Industrial Engg.	23	1	7	0	3	0	12	0	46
	Mechanical Engg.	33	1	10	0	6	0	18	1	69
	Total	**203**	**7**	**61**	**2**	**30**	**1**	**109**	**3**	**416**
Other State Quota (50%)	Civil Engg.	34	1	10	1	5	0	18	1	70
	Computer Engg.	23	1	7	0	3	0	12	0	46
	Electrical Engg.	34	1	10	0	5	0	19	1	70
	Electronics & Comm. Engg.	34	0	9	1	5	1	18	1	69
	Information Technology	23	1	7	0	3	0	12	0	46
	Production & Industrial Engg.	23	1	7	0	3	0	12	0	46
	Mechanical Engg.	33	1	10	0	6	0	18	1	69
	Total	**204**	**6**	**60**	**2**	**30**	**1**	**109**	**4**	**416**
	Grand Total	**407**	**13**	**121**	**4**	**60**	**2**	**218**	**7**	**832**

(ii) IIIT, Sonepat

Seat Matrix for admission to B.Tech. programmes (2016-17)

Quota	Branch	OP	OPPH	SC	SCPH	ST	STPH	OBC	OBCPH	TOTAL
All Indian Quota	Computer Science & Engineering	14	1	5	0	2	0	8	0	30
	Electronics & Communication Engineering	14	1	5	0	2	0	8	0	30
	Information Technology	14	1	5	0	2	0	8	0	30
	Total	42	3	15	0	6	0	24	0	90

2) Direct Student Admission Abroad (DASA/MEA/ICCR)

Under this category also the centralized admission is done based on the SAT score of the students who obtain their educational eligibility for B.Tech programmes of the NITs from foreign country.

Seat Matrix for admission to B.Tech. programmes (2016-17)

B.Tech Programmes	No of Seats (Minimum 5% of Intake or 5 whichever is less in DASA and ICCR)		
	DASA	ICCR	MEA#
Civil Engg.	5	5	1
Computer Engg.	5	3	1
Electrical Engg.	5	5	1
Electronics & Comm. Engg.	5	5	1
Information Technology	5	2	0
Production & Industrial Engg.	5	3	0
Mechanical Engg.	5	5	2
Total	**35**	**28**	**6**

MEA Seats are approved by the Ministry (MHRD) vide letter reference no 32-1/2013-TS.II dated 03rd July,2014. The copy of the letter is attached as Annexure 26.7 from Page 40 to 45.

(b) PG Programmes (M.Tech./MCA/MBA)

b.1 M.Tech through CCMT

Seat Matrix for admission to M.Tech(CCMT-2016) programmes (2016-17)

Sr. No.	Dept./ School	M.Tech. programme	OP	OBC	SC	ST	OP PWD	OBC PWD	SC PWD	ST PWD	Total
1.	Chemistry	Molecular Engineering	9	5	3	2	1	-	-	-	20
2.	Civil Engg.	Environmental Engineering	9	6	2	1	1	1	1	-	21
		Soil Mechanics & Foundation Engineering	9	5	3	1	-	-	-	-	18
		Structural Engineering	9	5	4	1	-	-	-	-	19
		Transportation Engineering	9	4	4	1	-	-	-	-	18
		Water Resources Engineering	9	4	3	1	-	-	-	-	17
3.	Computer Engg.	Computer Engg.	13	7	3	1	-	1	-	-	25
		Cyber Security	9	5	3	2	1	-	-	-	20
4.	Electrical Engg.	Control System	10	5	4	1	-	-	-	-	20
		Power Electronics & Drives	10	5	3	1	1	-	-	-	20
		Power System	10	5	3	2	-	-	-	-	20
5.	Electronics & Comm. Engg.	Electronics & Comm. Engineering	12	6	4	2	-	-	-	-	24
6.	Mechanical Engg.	Industrial and Production Engg.	10	5	4	1	-	-	-	-	20
		Machine Design	10	5	4	1	-	-	-	-	20
		Thermal Engineering	11	6	2	3		1		1	24
7.	Physics	Instrumentation	10	5	3	2	-	-	-	-	20
		Nanotechnology	9	6	2	2	1	-	-	-	20
8.	School of Biomedical Engg.	Biomedical Engg.	9	5	3	2	1	-	-	-	20
9.	School of Material Science and Nanotechnology	Material Science and Nanotechnology	9	5	3	2	1	-	-	-	20
10.	School of Renewable Energy & Efficiency	Renewable Energy Systems	9	5	3	2	1	-	-	-	20
11	School of VLSI Design & Embedded Systems	Embedded System Design	9	5	3	2	-	-	1	-	20
		VLSI Design	14	8	3	4	2	1	-	-	32
GRAND TOTAL (22 Programmes)			218	117	69	37	10	4	2	1	458

The seat matrix also includes 54 seats for TEQIP admissions in the respective M.Tech. programmes.

b 1.2) M.Tech Sponsored seats:

Seat Matrix for admission to M.Tech programmes (2016-17)

Sr. No.	Deptt./ School	M.Tech. programme	OP	OBC	SC	ST	OP PWD	OBC PWD	SC PWD	ST PWD	Total
1.	Chemistry	Molecular Engineering	2	2	1	0	0	0	0	0	5
2.	Civil Engg.	Environmental Engineering	2	1	1	1	0	0	0	0	5
		Soil Mechanics & Foundation Engineering	3	1	1	0	0	0	0	0	5
		Structural Engineering	3	1	1	0	0	0	0	0	5
		Transportation Engineering	2	1	1	0	0	1	0	0	5
		Water Resources Engineering	2	2		1	0	0	0	0	5
3.	Computer Engg.	Computer Engg.	3	1	1	0	0	0	0	0	5
		Cyber Security	3	1	1	0	0	0	0	0	5
4.	Electrical Engg.	Control System	2	2	1	0	0	0	0	0	5
		Power Electronics & Drives	3	1	0	1	0	0	0	0	5
		Power System	2	2	0	1	0	0	0	0	5
5.	Electronics & Comm. Engg	Electronics & Comm Engineering	3	1	1	0	0	0	0	0	5
6.	Mechanical Engg.	Industrial and Production Engg.	2	2	0	1	0	0	0	0	5
		Machine Design	2	1	1	0	1	0	0	0	5
		Thermal Engineering	3	1	1	0	0	0	0	0	5
7.	Physics	Instrumentation	2	2	1	0	0	0	0	0	5
		Nanotechnology	2	2	0	0	1	0	0	0	5
8.	School of Biomedical Engg.	Biomedical Engg.	2	1	1	1	0	0	0	0	5
9.	School of Material Science and Nanotechnology	Material Science and Nanotechnology	2	2	1	0	0	0	0	0	5
10.	School of Renewable Energy & Efficiency	Renewable Energy Systems	2	1	1	1	0	0	0	0	5
11	School of VLSI Design & Embedded Systems	Embedded System Design	3	1	1	0	0	0	0	0	5
		VLSI Design	3	1	1	0	0	0	0	0	5
GRAND TOTAL (22 Programmes)			**53**	**30**	**17**	**7**	**2**	**1**	**0**	**0**	**110**

Institute scholarship shall be available to only GATE qualified candidates at the time of admission, taking admission as non-sponsored candidates with GATE score above cut off in respective GATE paper.

b 1.3 Under DASA/MEA/ICCR Category

Seat Matrix for admission toM.Tech. programmes (2016-17)

Sr. No.	Deptt./ School	M.Tech. programme	DASA Seats	ICCR Seats	MEA Seats
1	Chemistry	Molecular Engineering	1	1	1
2.	Civil Engg.	Environmental Engineering	1	1	1
		Soil Mechanics & Foundation Engineering	1	1	1
		Structural Engineering	1	1	1
		Transportation Engineering	1	1	1
		Water Resources Engineering	1	1	1
3.	Computer Engg.	Computer Engg.	1	1	1
		Cyber Security	1	1	1
4.	Electrical Engg.	Control System	1	1	1
		Power Electronics & Drives	1	1	1
		Power System	1	1	1
5.	Electronics & Comm. Engg	Electronics & Comm. Engineering	1	1	1
6.	Mechanical Engg.	Industrial and Production Engg.	1	1	1
		Machine Design	1	1	1
		Thermal Engineering	1	1	1
7.	Physics	Instrumentation	1	1	1
		Nanotechnology	1	1	1
8	School of Biomedical Engg.	Biomedical Engg.	1	1	1
9.	School of Renewable Energy & Efficiency	Renewable Energy Systems	1	1	1
10.	School of VLSI Design & Embedded Systems	VLSI Design	1	1	1
		Embedded System Design	1	1	1
11	School of Material Science and Nanotechnology	Material Science and Nanotechnology	1	1	1
GRAND TOTAL (66)			**22**	**22**	**22**

MCA Seat Matrix (NIMCET-2016-17) Govt-Funded Seats (Regular)

Quota	OP	PH (OP)	OBC	PH (OBC)	SC	PH (SC)	ST	PH (ST)	Total seats
All India	29	01	16	01	09	-	04	-	60

MCA Seat Matrix for 2016-17(Self –Financed Seats)

Quota	OP	PH (OP)	OBC	PH (OBC)	SC	PH (SC)	ST	PH (ST)	Total seats
All India	15	-	8	-	04	1	02	-	30

MCA (DASA/ICCR/MEA) Seat Matrix for 2016-17

Sr. No.	DASA Seats	ICCR Seats	MEA Seats
1	1	1	1

MBA Seat Matrix (NIMCET-2016-17) Govt-Funded Seats (Regular)

Quota	OP	PH (OP)	OBC	PH (OBC)	SC	PH (SC)	ST	PH (ST)	Total seats
All India	29	01	16	01	09	-	04	-	60

MBA Seat Matrix for 2016-17(Self –Financed Seats)

Quota	OP	PH (OP)	OBC	PH (OBC)	SC	PH (SC)	ST	PH (ST)	Total seats
All India	15	-	8	-	04	1	02	-	30

MBA (DASA/ICCR/MEA) Seat Matrix for 2016-17

Sr. No.	DASA Seats	ICCR Seats	MEA Seats
1	1	1	1

The Senate may kindly approve the seat matrix of UG and PG Programmes under different categories for academic session 2016-17.

ANNEXURE-26.7

No.32-1/2013-TS.II
Government of India
Ministry of Human Resource Development
Department of Higher Education

Shastri Bhawan, New Delhi
04 July 2014

To

1 Ms. Neeta Bhushan, Joint Secretary (Parl. & Coord).
Ministry of External Affairs
South Block,
New Delh .

2 Shri Santosh Jha,
Joint Secretary (Welfare),
Ministry of External Affairs,
No 149-C, South Block,
New Delhi.

Subject:- Reservation of Seats in Degree level technical courses for foreign and other categories of students for academic sessions 2014-15.

Sir,

In supersession of this Ministry's letter of even number dated 03.07.2014, I am directed to say that under the ongoing scheme of reservation of seats in Engineering / Technology / Architecture / Pharmacy courses conducted at Degree level Technical Institutions approved by the All India Council for Technical Education (AICTE), the details of the seats allocated in Degree level Technical Courses for 2014 – 2015 is enclosed.

2. The eligibility criteria in respect of MEA (Education) will remain the same as was in previous years. However, from the academic year 2014-15, the Standard Aptitude Test (SAT-II) could be basis of selection under MEA (Welfare) quota.

3 **As per the schedule of admission laid down by the Hon'ble Supreme Court in a Civil Appeal No.9046 of 2012 of Parshavanath Charitable Trust & Others Vs. AICTE, the last date of admission against the allocation for the year 2013-14 was 15.08.2013. In accordance with the direction of the Hon'ble Supreme Court, the last date of admission for the year 2014-15 is 15.08.2014. The concerned authorities should ensure to complete the admission requirements by 15.08.2014. No request for extension of date shall be considered.**

Yours faithfully,

[Tripti Gurha]
Director (TC)
Tel: 23381095

Encl: as above

Copy to The President, Council of Architecture, India Habitat Centre, Core 6A, 1st Floor, Lodhi Road, New Delhi-110003 for admission under Architecture programmes against seats available in colleges.

[Tripti Gurha]
Director (TC)

No 32-1/2013-TS.II
Government of India
Ministry of Human Resource Development
Department of Higher Education

Shastri Bhawan, New Delhi
05 July 2014

1. Ms. Neeta Bhushan, Joint Secretary (Pak & Coord),
Ministry of External Affairs,
South Block,
New Delhi.

2. Shri Sanmar Jha,
Joint Secretary (Welfare),
Ministry of External Affairs,
No 145-C, South Block
New Delhi

Subject:- Reservation of Seats in Degree level technical courses for States / UTs lacking in such facilities for academic sessions 2014-15.

Sir

I am directed to say that under the ongoing scheme of reservation of seats in Engineering / Technology / Architecture / Pharmacy courses conducted at Degree level Technical Institutions approved by the All India Council for Technical Education (AICTE), the Ministry of HRD has changed the eligibility criteria to get admission under the Scheme.

2. The details of the seats allocated in Degree level Technical Courses for 2014 – 2015 is enclosed.

3. The schedule of admission as laid down by the Hon'ble Supreme Court in a Civil Appeal No.9048 of 2012 of Parshvanath Charitable Trust & Others Vs. AICTE, the last date of admission against the allocation for the year 2013-14 was 15.06.2013. In accordance with the direction of the Hon'ble Supreme Court, the last date of admission for the year 2014-15 is 15.06.2014. The concerned authorities should ensure to complete the admission requirements by 15.06.2014. No request for extension of date shall be considered.

4. The documents regarding allocation of Degree Level Seats for the year 2014-15 can also be accessed in the Ministry's website i.e. http://mhrd.gov.in/higher_education_circulars

Yours faithfully,

[Tripti Gurha]
Director (TS)
Tel: 23381094

Copy to The President, Council of Architecture, India Habitat Centre, Core 6A, 1st Floor, Lodhi Road, New Delhi 110003 for admission under Architecture programmes against seats available in colleges.

[Tript: Gurha]
Director (TC

For NOMINATING AGENCY:

15 MINISTRY OF EXTERNAL AFFAIRS (WELFARE)

The Joint Secretary (Welfare)
Ministry of External Affairs
Akbar Bhawan, Chanakyapuri, New Delhi.

Course	Total Seats Allotted	Seats are reserved at								
		Punjab	Haryana	Delhi	Gujarat	Karnataka	Maharashtra	West Bengal	Tamil Nadu
Computer S/T/E/S&E	5	2	1				2		0
Electrical & Electronics E	1								
Electronics & Comm. E	6			1	0	1			
Mechanical E								1	
Pharmacy	1			1					
GRAND TOTAL	15*	2	1	2	3	2	2	1	4

E Engineering; S: Science, T Technology

The name of the institutes

PUNJAB
Beant College of Engg.& Technology, Gurudas Pur Comp S&E- 1
SGS College of Engg & Technology, Ferozepur Comp S&E–1

HARYANA
Deen Bandhu C R University of Science & Technology, Murthal Comp S&E–1

DELHI
Delh College of Engg (Now Delhi Technical University) or Netaji Subhash Inst. of Tech., Delhi Electronics & Comm.–1
College of Pharmacy, Pushp Vihar, Phar. 1

GUJARAT
Govt.Engg. College, Modasa Enics & Comm.–2
L.D. College of Engg. Ahmedabad Enics. & Comm.–1

KARNATAKA
National Institute of Engg., Mysore, Elect. & Enics–1
Sri Jayachamarajendra College of Engg., Mysore, Enics. & Comm–1

MAHARASHTRA
Sr. Manatma Basweshwar Edu Soc M S Bidve College of Engineering, Barsi Road, Latur Comp T – 3
Walchand Inst of Tech Ashok Chowk Sholapur Comp S - 1

WEST BENGAL
Jalpaiguri Govt Engg College, Jalpaiguri Mech 1

TAMIL NADU
PSG College of Technology, Coimbatore Comp. S&E–2
Govt. College of Engg., Tirunelveli Comp. S&E- 1
Saththai Periyar Govt. Institute of Technology, Vellore Enics. & Comm.–1

* Distribution for the 62 seats transferred from Education Division to Welfare Division, will be same as in last years' distribution done by Ministry

For NOMINATING AGENCY:

15. MINISTRY OF EXTERNAL AFFAIRS (WELFARE)

The Joint Secretary (Welfare),
Ministry of External Affairs,
Akbar Bhawan, Chanakyapuri, New Delhi

Course	Total Seats Allotted	Seats are reserved at								
		Punjab	Haryana	Delhi	Gujarat	Karnataka	Maharashtra	West Bengal	Tamil Nadu
Computer S/E/T/S&E	6	2	1				2		3
Electrical & Electronics E	1					1			
Electronics & Comm. E	5			1	3	1			1
Mechanical E	1							1	
Pharmacy	1			1					
GRAND TOTAL	78*	2	1	2	3	2	2	1	4

E: Engineering; S: Science; T: Technology

The name of the institutes

PUNJAB
Beant College of Engg.& Technology, Gurudas Pur : Comp S&E–1
SBS College of Engg & Technology, Ferozepur Comp S&E–1

HARYANA
Deen Bandhu C R University of Science & Technology, Murthal Comp S&E–1

DELHI
Delhi College of Engg (Now Delhi Technical University) or Netaji Subhash Inst. of Tech., Delhi Electronics & Comm.–1
College of Pharmacy, Pushp Vihar Phar–1

GUJARAT
Govt.Engg. College, Modasa : Enics. & Comm –2
L.D. College of Engg., Ahmedabad. Enics. & Comm.–1

KARNATAKA
National Institute of Engg., Mysore Elect. & Enics–1
Sri Jayachamarajendra College of Engg., Mysore : Enics. & Com.–1

MAHARASHTRA
Sri. Mahatma Basweshwar Edu Soc M S Bidve College of Engineering, Barsi Road, Latur Comp 1 – 1
Walchand Inst of Tech. Ashok Chowk, Sholapur: Comp.E – 1

WEST BENGAL
Jalpaiguri Govt Engg. College, Jalpaiguri: Mech. 1

TAMIL NADU
PSG College of Technology, Coimbatore Comp. S&E 2
Govt. College of Engg., Tirunelve.. Comp. S&E–1
Thanthai Periyar Govt. Institute of Technology, Vellore Enics. & Com.–1

* Distribution for the 62 seats transferred from Education Division to Welfare Division, will be same as per last years' distribution done by Ministry

Allocation of B.E/B.Pharmacy Seats to Welfare Section for the year 2014-15

Course	SEATS RESERVED AT								Regional Engineering Colleges/ National Institutes of Technology																Welfare Section
	Delhi (Coll of Pharm NSIT - test DCE)	MP/Chandigarh	LM College of Pharmacy, Ahmedabad	Goa College of Phar. Panaji	Po. Engg. College, Pondicherry	Jamia Hamdard, New Delhi	SPA, New Delhi	BEC, Howrah	Allahabad	Bhopal	Calicut	Durgapur	Hamirpur	Jaipur	Jalandhar	Jamshedpur	Kurukshetra	Nagpur	Rourkela	Silchar	Surat	Surathkal	Tiruchirappalli	Warangal	
Architecture (E)							1																		1
Civil E								1	2	3	1		1	1	1		1	✓				1		2	14
Chemical E/T																									0
Computer S/T/E/S&E/S&T		2						1	1	2		3	1		1		1	✓	1		1	1		1	16
Electrical E										1		1					1	✓							3
Electrical and Electronics E											1											2		1	4
Electronics E									2	2				1							1		1		7
Electronics & comm. E					1						1	1	1		1		1	✓				1		1	8
Electronics & Telecom E																									
Industrial E															1										1
Industrial & Production E																									
Mechanical E									1	1		1		1			2	✓						2	9
Metallurgy (E)																									
Mining E																									
Planning																									
Production E																									
Pharmacy																									
Grand Total		2			1		1	2	6	9	3	6	3	3	4		6		1		2	5	1	7	62

Item 26.8 **To note the approval of start of two new M.Tech. programmes offered by the Chemistry and Computer Engineering Department and consider minor changes in the nomenclature of M.Tech. programme of Chemistry department.**

The Board in its 36th Meeting vide agenda item no 36.13 and 36.14 approved to start M.Tech. program wef 2015-16 in Chemistry and Computer science Department with following observation in case of M.Tech. programme offered by the Chemistry Department.

The Board desired that the nomenclature of the M.Tech. programme offered by the Chemistry department be changed to M Tech. (Molecular Engineering) instead of M.Tech.(Molecular Engineering and Advanced Chemical Analysis). The Board further resolved that the syllabus content be modified accordingly by the Chemistry department

The meeting minutes of the Board is enclosed as Annexure 26.8 from Page 47 to 50.

The Senate may kindly note the approval of the Board.

T-1161

ANNEXURE-26.8

NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA – 136119

No. NITK / 36th BOG / 3147 Dated: 12/6/15

Item 36.13 To consider and approve start of M. Tech programme in 'Molecular Engineering and Advanced Chemical Analysis' offered by Chemistry Department.

The Board of Governors of the Institute at its 36th meeting held on 08.05.2015 has decided as under:-

The Board considered the proposal of the Institute and approved in principle the start of the new M. Tech. Programme by the Chemistry Department. However, the Board desired that the nomenclature of the M. Tech. Programme be changed to M. Tech. in 'Molecular Engineering' instead of 'Molecular Engineering and Advanced Chemical Analysis'. The Boarp further resolved that the syllabus contents be modified accordingly.

This is for your reference, record and further necessary action in the matter.

Encl: Agenda Item

(Shyam Narayan)
Registrar

1. Dean (Planning & Development)
2. Dean (Academic)
3. Head, Department of Chemistry
4. Deputy Registrar (GA & L)

PIA / DR(GA) 12/6/15

DR(GA) To kindly update the c/s on the follow up action and the initiative taken up with Dr. Chandrashekar, Director, CEERI, Pilani.

47 Dated 16.06.15

Item: 36.13 **To consider and approve start of M. Tech programme in 'Molecular Engineering and Advanced Chemical Analysis' offered by Chemistry Department.**

The Senate in its 25th meeting held on 24.2.2015 vide item 25.11 (i) copy enclosed as (Annexure - 36.13.i from pages 131 to 136) noted the approval of Chairperson Senate to start M. Tech. programme in Molecular Engineering and Advanced Chemical Analysis offered by Chemistry Department.

The Board may kindly approve to start the M. Tech. programme in Molecular Engineering and Advanced Chemical Analysis offered by Chemistry Department from the Academic session 2015-16.

17/6/15

NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA – 136119

No. NITK / 36th BOG / 3148 Dated: 12/6/15

Item 36.14 To consider and approve start of M. Tech programme In Cyber Security offered by Computer Engineering Department.

The Board of Governors of the Institute at its 36th meeting held on 08.05.2015 has decided as under:-

The Board considered and approved the proposal of the Institute to start the M. Tech programme in Cyber Security offered by Computer Engineering Department.

This is for your reference, record and further necessary action in the matter.

Encl: Agenda Item

(Shyam Narayan)
Registrar

1. Dean (Planning & Development)
2. Dean (Academic)
3. Head, Department of Computer Engg.
4. Deputy Registrar (GA & L)

16.06.15

PIA / DR (Acad)

GKS Please file in the Board Decision file

17/06/15

Item: 36.14 To consider and approve start of M. Tech programme in Cyber Security offered by Computer Engineering Department.

The Senate in its 25th meeting held on 24.2.2015 vide item 25.15 (iii) copy enclosed as (Annexure - 36.14.i from pages 138 to 142) welcomed and agreed in principle to start M. Tech. programme in Cyber Security offered by Computer Engineering Department.

The Board may kindly approve to start the M. Tech programme in Cyber Security offered by Computer Engineering Department from the Academic session 2015-16.

Item 26.9 To note the approval accorded by the Chairman, Senate
(a) Amendment of R-7.2 Ph.D. regulation.
(b) Minor Modification in Pre-Ph.D. scheme of Mathematics Department
(c) Scheme and Syllabi for M.Tech. Computer Engineering (Cyber Security)

(a) Amendment of R-7.2 Ph.D. regulation.

The Chairman Senate approved amendment of R-7.2 of Ph.D. regulation w.e.f. Even Semester of Academic Session 2014-15 for Ph.D. admission on 09.01.15 . This was necessary especially for the Ph.D. student to be admitted in the newly established interdisciplinary schools of the Institute where the regular faculty is not available. The Ph.D. prospectus of the Institute also emphasizes on the Interdisciplinary research hence the R-7.2 of Ph.D. regulation was amended as below;-

" R-7.2 :- A regular faculty of any School/Departments of the NITK holding a Doctoral degree can be appointed as supervisor on recommendation of the respective DRCs of concerned Schools/Departments. A non-Ph.D. scientist/engineer having experience (in relevent area of research) of 15 years or more at the level of Associate Professor or higher may also be appointed as Co-Supervisor"

A notification in this regard was issued vide Ref No. Acad/15904 dated 22.01.2015.

Approval of the Chairman Senate, Notification for item no. 26.9(a) is enclosed as Annexure 26.9(a) from Page 52 to 53.

The Senate may kindly note the approval accorded by the Chairman, Senate.

(2)

ANNEXURE-26.9(a)

During the last three years, four new schools have been started in the Institute i.e. School of VLSI Design & Embedded System, School of Renewable Energy & Efficiency, School of Biomedical Engg. and School of Material Science and Nanotechnology. The inter disciplinary schools have a mandate to promote research and are enrolling students leading to degrees of masters and Ph.Ds. However, due to non availability of regular faculty in the schools, the faculty associated with the schools for the purpose of teaching may please be permitted to serve as the PhD coordinators.

Submitted for kind approval please.

[signature] 06.01.15
Dean (Academic)

DR(Acad)

[signature]
09/01/15

[signature] 12.01.15

DR(Acad)

Supdt(Acad)-2: put up notification

Draft Notification is attached for kind approval by the Dean (Acad)

Dealing Assistant
[signature] 20/1

[signature]
DR(Acad)

[signature] 21.01.15
Dean (Acad)

DR(Acad)
Please put up agenda item to upcoming Senate meeting.
[signature] DC

NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA-136119
(OFFICE OF DEAN ACADEMIC)

No. Acad/15/904 Dated : 22.01.2015

NOTIFICATION

The page No. 2 (para No. 2) of Ph.D prospectus 2013-14 may kindly read as under:-

"The Institute undertakes sponsored research and development projects from various industrial and other organizations in public and private sectors. The Institute encourages research in inter-disciplinary areas also, and provides opportunities for such programs".

In view of above the Hon'ble Director has accorded the approval for enrolment of students in inter-disciplinary schools where the regular faculty is not available. In such Schools/Departments students would be registered in the appropriate research area on the recommendations of their respective DRCs. Such students would be assigned Supervisors under R-7.2 of Ph.D prospectus from the regular full time faculties of other departments/schools also on recommendation of their respective DRCs.

In view of above R-7.2 of Ph.D prospectus is need to be amended as below:-

"A regular, full-time, faculty member of any Schools/Departments of the NITK holding a Doctorate degree can be appointed as supervisor on recommendation of the respective DRCs of concerned Schools/Departments. A Non-Ph.D scientist/engineer having experience (in relevant area of research) of 15 years or more at the level of Associate Professor or higher may also be appointed as co-supervisor".

The above amendment will be applicable w.e.f. 2014-15 even semester.

The notification is issued with the permission of competent authority.

D.R. (Academic) 22/1/15

22.1.15

Copy to :

All HOD,s/Co-ordinators

All Deans

C.O.E

Sr. Secretary to Director for kind information please.

Sr. Secretary to Registrar for kind information please.

(b) Minor Modification in Ph.D. scheme of Mathematics Department.

The Chairman, Senate has approved some minor modifications in the Pre-Ph.D. (Scheme) of Mathematics Department for Pre-Ph.D. course work on 22.12.14.

This was done to fulfill the requirement of the minimum 4 course work of Pre-Ph.D. programme as per the amended Ph.D. regulations from 2012-13.

Approval of Chairman Senate, BOS/DAC of the Department taken for item 26.9(b) is enclosed as Annexure 26.9(b) from Page 55 to 59.

The Senate may kindly note the approval accorded by the Chairman, Senate

ANNEXURE-26.9(b)

Item :

To note the approval of the Chairman, Senate to the minor modifications in Pre-Ph D (scheme) of Mathematics Department.

The post facto approval of the Hon'ble Director is enclosed herewith for ready reference as **Annexure-B , C & D on page No. 1 to 4.**

The Senate may kindly note as above.

18/11/15

DR(Acad) 19/11/15

Dean (Acad)

Annexure 15

DEPARTMENT OF MATHEMATICS
National Institute of Technology
Kurukshetra- 136119

MA/14/ 66 Date: 10-12-2014

The Department of Mathematics started Pre-Ph.D. course work in 2012-13 with 3 courses and one seminar. The details of the scheme are as follows.

Odd semester:	1. Research Methodology and Review of Research	(MAT-701T)	Credit 3.5
	2. Applied Numerical Analysis	(MAT-703T)	Credit 3.5
Even Semester:	1. Seminar	(MAT-702P)	Credit 2.5
	2. One Optional course out of 10 approved courses		Credit 3.5
		Total Credit	**13**

Details of Optional Courses: (Credit 3.5 each)

1.	Advance Numerical Techniques	(MAT-704T)
2.	Algebra	(MAT-706T)
3.	Lie Theory and Special Functions	(MAT-709T)
4.	Mathematical Analysis	(MAT-710T)
5.	Ferro Hydrodynamics	(MAT-712T)
6.	Boundary Layer Theory	(MAT-714T)
7.	Mechanics of Deformable Bodies	(MAT-715T)
8.	Statistical Techniques	(MAT-718T)
9.	Stochastic Processes and Their Applications	(MAT-720T)
10.	Reliability Theory and Survival Analysis	(MAT- 722T)

To have uniformity in Pre-Ph.D. course work scheme at the Institute level to offer at least 4 course (vide Ph.D. rules 2013-14), DRC replaced the Seminar (MAT-702P) in even semester with one of the approved optional courses and sent the minutes to the Dean (Academic) vide letter no. MA/14/533, dated: 31/07/2013 (copy enclosed) and, the scheme with minor modification was offered w. e. f. 2013-14.

However, the COE did not receive the approved copy of the same (conveyed to the Department vide letter no. Exam/2014, dated: 08/1/14) and therefore delayed the DMC of the session (May – June, 2014).

The Dean, academic is kindly requested to get the formal approval of this minor modification in the Pre-PhD course work scheme as again resolved by the DRC vide letter no. MA/14/536 dated. 27/11/14 (copy attached) and convey the same to COE so that the DMC of students appears in the last semester may be released.

(HOD)

Dean (Acad.)

Annexure-C

NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA-136119

No. Dean (Acad.)/2012 Dated: 26.07.2012

Subject: Approval to the revised syllabi of B. Tech/Ph. D courses offered by Department of Mathematics

The Department of Mathematics has submitted the following revised syllabi of B Tech/Ph. D courses offered by the Department of Mathematics

B Tech courses

1st Semester MAT-105 Mathematics-I

2nd Semester MAT-106 Mathematics-II

3rd/4th Semester MAT-203/204 Mathematics-III

4th Semester MAT-208 Mathematics-IV

7th Semester (Open Elective) MAT-469 Advanced Mathematics-I

8th Semester (Open Elective) MAT-498 Advanced Mathematics-II

Pre-Ph.D. Course Work

First Semester

Paper	Title	Credit
	Research Methodology and Review of Research (MAT-R1)	3.5
I	Applied Numerical Analysis (MAT-R2)	3.5

Second Semester

Paper	Title	Credit
III	Seminar (MAT-R3)	2.5
IV	Optional	3.5
	1. Advance Numerical Techniques (MAT-R4)	
	2. Algebra (MAT-R5)	
	3. Lie Theory and Special Functions (MAT-R6)	

- 3 -

[illegible] Mathematical Analysis ([illegible])

[illegible] Hydrodynamics ([illegible])

[illegible] Boundary Layer Theory ([illegible])

[illegible] Mechanics of Deformable Bodies ([illegible])

[illegible] Statistical Techniques ([illegible])

[illegible] Stochastic Processes and Their Applications ([illegible])

[illegible] Reliability Theory and Survival Analysis ([illegible])

Total Credit 15

The syllabi of the courses above have been approved by the BOS of Mathematics Department. Because the revised syllabi are to be effective from the academic session 20[illegible], it is requested that the approval to the above mentioned revised syllabi may kindly be accorded by the Chairman, Senate.

Submitted for kind approval please.

Dean, Academics

Director & Chairman, Senate

Annexure - D

Acad/14/1079
26/12/14

-4-

The DRC of Mathematics Department has made some minor modifications in Pre-Ph.D (scheme) to uniformity in the scheme at Institute level and offered the courses w.e.f. July-2013, the copy o minutes of DRC is enclosed as **Annexure-A**. **The revised scheme is enclosed as Annexure-B**. Earlie scheme was approved by the Hon'ble Director as Chariman Senate on 22.7.2012. The copy of the approval is enclosed as **Annexure-C**.

The COE has reported that he did not receive the approval of the Director for revised scheme of the course work offered by Mathematics Department, hence. DMC of Ph.D scholars can not be issued

In view of above the Hon'ble Director may kindly accord the post facto approval for revised scheme o Ph D course work of Mathematics Department duly recommended by the DRC

Dean (Acade

Director

22/12/14

Encls. Annexure-A , B & C for ready reference please

23.12.14

DR(Acad)/ASG-I for suitable information to CoE

26/12/14

NIT, KURUKSHETRA
No. 19284

29/12/14
OC Received

(c) Scheme and Syllabi for M.Tech. Computer Engineering (Cyber Security)

The Senate in its 25th Meeting vide agenda item no. 25.15(iii) welcomed and approved in principle to start M.Tech programme in Cyber Security in Computer Engineering department from academic session 2015-16

The Computer Engineering department vide their letter ref CO/2015/242 dated 22.04.2015 requested the Chairman, Senate through Dean(Academic) to approve the scheme and syllabi duly approved by the Board of Studies(BOS) for the newly started M.Tech programme in Cyber Security. The Chairman Senate approved the proposed scheme and syllabi of the newly M.tech programme in Cyber Security on 30.04.15.

The department also proposed to name this programme as M.Tech Computer Engineering (Cyber Security) on recommendation of their respective BOS which was also approved by the Chairman Senate on 30.04.15.

Recommendation of the Board of Studies/DAC and scheme and syllabi for M.Tech Computer Engineering (Cyber Security) for item 26.9(c) is enclosed as Annexure 26.9(c) from Page 61 to 112.

The Senate may kindly note the approval accorded by the Chairman, Senate

COMPUTER ENGINEERING DEPARTMENT
NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA

No. CO/2015/2.42 **Dated: 22.04.2015**

In the 25th meeting dated 24.02.2015 item no. 25.15 (III), the Senate has approved in principle to start M.Tech. in Cyber Security w.e.f. academic session 2015-16.

The Board of Studies (BOS) of department has decided to name the programme as M.Tech. Computer Engineering (Cyber Security) and approved the scheme and syllabi for the same in its meeting dated 14.04.2015.

As the above mentioned programme is to be offered w.e.f academic session-2015-16, The approval of competent authority may be taken. The related information is submitted for necessary action in this regards.

22.4.15

Head of Department

Dean (Academic) 23.04.15

For approval of the program, pl.

Director & chairman Senate

30/4/15

COMPUTER ENGINEERING DEPARTMENT
NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA

No. CO/2015/ **Dated: 14.04.2015**

Subject: Minutes of BOS meeting held on 14.04.2015

A meeting of BOS was held on 14.04.2015 at 12:30 PM in the conference room of Department. The following members were present:

1.	Dr. A.K. Singh, Prof.	(In chair)
2.	Dr. Mayank Dave, Prof.	(Member)
3.	Dr. J.K. Chhabra, Prof.	(Member)
4.	Dr. S.K. Jain, Prof.	(Member)
5.	Dr. R.K. Aggarwal, Asso. Prof.	(Member)
6.	Dr. R.M. Sharma, Asso. Prof.	(Member)
7.	Sh. Virender Ranga, Asst. Prof.	(Member)
8.	Ms. Priyanka Ahlawat, Asst. Prof.	(Member)
9.	Sh. Mohit Dua, Asst. Prof.	(Member)
10.	Dr. B.B. Gupta, Asst. Prof.	(Special invitee)
11.	Dr. S.K. Gupta, Prof.	(External Member)
12.	Sh. Sajeev Pippal, Asso. Prof.	(External Expert)

Prof. R.D. Chaudhary, Prof., IIT Mandi & Shri Amit Sharma, Joint Director, DKDO, conveyed their unavailability for the meeting.

Following decisions were taken:

The scheme and syllabi of M.Tech. Computer Engineering (Cyber Security) were approved.

The meeting was ended with vote of thanks to the Chair

(Sajeev Pippal) (S.K. Gupta) (B.B. Gupta) (Mohit Dua)

(Priyanka Ahlawat) (Virender Ranga) (R.M. Sharma) (R.K. Aggarwal)

(S.K. Jain) (J.K. Chhabra) (Mayank Dave) (A.K. Singh)

Copy to:

1. All BOS members (Through Email)
2. Dean (Academic)
3. DS to Director for kind information of Director

Scheme

Department of Computer Engineering, NIT Kurukshetra (Haryana)

Proposed Scheme for the M.Tech Computer Engineering (Cyber Security)

Sr. No.	Code	Course Title	Teaching Schedule L	T	P	Total	Credit
First Semester							
1.	COE-501	Advanced Data Structures and Algorithms	3	0	0	3	3
2	COE-551	System and Network Security	3	0	0	3	3
3.	COE-553	Data Privacy	3	0	0	3	3
4		Elective-1	3	0	0	3	3
5.		Elective -2	3	0	0	3	3
6.	COE-561	System and Network Security Laboratory	0	0	2	2	1
7.	COE-563	Data Privacy Laboratory	0	0	2	2	1
8.	COE-565	Seminar	0	0	2	2	1
		Total				21	18
Second Semester							
1.	COE-552	Number Theory and Cryptology	3	0	0	3	3
2	COE-554	Introduction to Cyberspace Operations and Design	3	0	0	3	3
3.		Elective-3	3	0	0	3	3
4.		Elective-4	3	0	0	3	3
5.		Elective-5	3	0	0	3	3
6.	COE-562	Number Theory and Cryptology Laboratory	0	0	2	2	1
7.	COE-564	Elective-3 Laboratory	0	0	2	2	1
8.	COE-566	Seminar	0	2	0	2	1
		Total				21	18
Third Semester							
1.	COE-611	Preparatory Work for Dissertation	0	0	20	20	10
		Total				20	10
Fourth Semester							
	COE-612	Dissertation	0	0	32	32	16
		Total				32	16

List of Elective Courses

Elective-1		Elective-2		Elective-3		Elective-4		Elective-5	
Code	Course Title	Code	Course Title	Code	Course Title	Code	Course Title	Code	Course Title
COE-525	Pattern Recognition and Machine Learning	COE-531	Distributed Computing	COE-524	Soft Computing	COE-582	SCADA and DCS Security	COE-536	Research Methodology
COE-571	Intrusion Detection Systems	COE-581	System & Device Driver Programming	COE-572	Biometric Security	COE-584	Ethics and Law of Cyber Security	COE-538	Mobile Computing
COE-573	Information Theory and Coding	COE-583	Information Warfare	COE-574	Information Security Risk Management	COE-586	Fuzzing and Software Crash Analysis	COE-594	Ethical hacking
COE-575	Cloud Computing and Big Data	COE-585	Mobile and Wireless Network Security	COE-576	Proactive Security Tools and Techniques	COE-588	Advanced Operating System Design and Security	COE-596	Digital Forensics & Incident Response
COE-577	Vulnerability Discovery and Exploit Development	COE-587	Secure Coding	COE-578	Social Network Analysis	COE-590	BIOS and SMM Security	COE-598	Data Mining and Analysis
COE-579	Game Theory	COE-589	Special Topics in Security-I	COE-580	Enterprise Security & Management	COE-592	Disaster Recovery	COE-600	Special Topics in Security-II

COMPUTER ENGINEERING DEPARTMENT
NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA

No. CO./2015/2 64 **Dated: 21.04.2015**

Subject: Syllabus of M.Tech. Computer Engineering (Cyber Security)

The modification suggested by Dr. S.K. Gupta and Dr. Sanjeev Pippal in BOS meeting dated 14.04.2015 have been incorporated and the approval of the same have been received from them by email (copy enclosed). It is requested that the internal BOS members and special invitee may approve the same by rotation.

(B.B. Gupta) (Mohit Dua) (Priyanka Ahlawat) (Virender Ranga)

(R. M. Sharma) (R. K. Aggarwal) (S. K. Jain) (J. K. Chhabra)

(Mayank Dave) (A. K. Singh)

Gmail

Dr B B Gupta <gupta.brij@gmail.com>

M.Tech Comp. Engg. (Cyber Security) Syllabi

sanjeev pippal <sanpippalin@gmail.com> 17 April 2015 at 14:31
To: Awadhesh Kumar Singh <aksinreck@rediffmail.com>
Cc: skg@cse.iitd.emet.in, Dr B B Gupta <gupta.brij@gmail.com>, director@nitkkr.ac.in

Dear Sir,

Thank you very much for invitation to attend BOS meeting held on 14-04-15 in the Dept. of Computer Engg., NIT Kurukshetra. It was very much learning for me as well, with the best of the experts in the discussion for scheme and syllabi of M.Tech Comp. Engg. (Cyber Security).
I have gone through the necessary updations in the syllabi and hereby confirm approval from my side. Once again thanking you for the consideration.

with kind regards,

Sanjeev Pippal
Associate Professor,
JRE Group of Institutions.
Greater Noida.

[Quoted text hidden]
[Quoted text hidden]
---------- Forwarded message
From: Brij <gupta.brij@gmail.com>
To: Awadhesh Kumar Singh <akshreck@rediffmail.com>
Cc:
Date: Fri, 17 Apr 2015 12:42:03 +0530
Subject: Fwd: Cyber security syllabus
Dear Sir,

PFA

Regards,
Brij

--
Sanjeev Pippal

Associate Professor
Department of IT,
JRE SOE
JRE GROUP OF INSTITUTIONS, Greater Noida,
Uttar Pradesh - 201308,
Mobile No. 09818398288.
sanpippalin@gmail.com,sanjeev.pippal@jre.edu.in,pippal.it@jre.edu.in

Gmail

Dr B B Gupta <gupta.brij@gmail.com>

M.Tech Comp. Engg. (Cyber Security) Syllabi

Shyam Kumar Gupta <skg@cse.iitd.emet.in> 20 April 2015 at 15.44
Reply-To: skg@cse.iitd.emet.in
To: "gupta.brij" <gupta.brij@gmail.com>
Cc: "gupta.shyamkumar@gmail.com" <gupta.shyamkumar@gmail.com>, skg@cse.iitd.emet.in, Dr B B Gupta <gupta.brij@gmail.com>, Awadhesh Kumar Singh <aksinreck@rediffmail.com>

Dear all

Thanks for giving me this opportunity to participate in this exercise.

I find the document to be comprehensively prepared. I have some small observations given below. Other members of the committee may consider them .
all the best
=skg

A: In the course on System and Network Security, confidentiality may be dropped as it would be covered in the privacy course. In a similar way, cryptography would be covered in Number Theory and cryptography and may be dropped here.

B: In the course on Data Privacy, we may add the following:

Access control models, Role Bases Access Control, Privacy policies, their specification, languages and implementation, privacy policy languages, Privacy in different domains Medical, financial etc

C: In the course on Pattern recognition and Machine Learning, Probability and statistics may be dropped

D. In the course on Number theory and Cryptography, primality proving may be replaced by primality testing, prime fatorisation may be added

---

> Dear Sir,Â
>
> Please find attached another copy of the Syllabi attached with this
> email.Â
>
> Kindly confirm the safe receipt of the document
>
> Regards,
> Brij
>

>
> ---------- Original message ---------- From: Brij
> <gupta.brij@gmail.com> Date:17/04/2015 1:15 PM (GMT+05:30)
> To: gupta shyamkumar@gmail.com Cc: Awadhesh Kumar
> Singh <alks nreck@rediffmail.com> Subject: Fwd. M.Tech Comp.
> Engg (Cyber Security) Syllabi
>
[Quoted text hidden]
[Quoted text hidden]

M.Tech Computer Engg. (Cyber Security)
w.e.f. Academic session 2015-16
Syllabi

COE-501

Advanced Data Structures and Algorithms

Objectives:

To develop the understanding of advanced data structures and algorithms.

Learning Outcomes:-

On completion of this course students should have gained an understanding of algorithmic / data structure language and notation, including order notation, and how to calculate the running times of algorithms. Students should also understand how to estimate, profile, and measure algorithm complexity and performance. The Key Learning Outcomes are:

- Compare, contrast, and apply the key algorithmic design paradigms: brute force, divide and conquer, decrease and conquer, transform and conquer, greedy, dynamic.
- Compare, contrast, and apply key data structures: trees, lists, stacks, queues, hash tables, and graph representations.
- Define, compare, analyze, and solve general algorithmic problem types: sorting, searching, string processing, graphs, and geometric.
- Compare, contrast, and apply algorithmic tradeoffs: time vs. space, deterministic vs. randomized, and exact vs. approximate.
- Implement, empirically compare, and apply fundamental algorithms and data structures to real-world problems.

Syllabus:

Complexity of algorithms: worst case, average case, and amortized complexity. Algorithm analysis techniques, Amortized Analysis, Garbage collection, Analysis of Quick sort, Fibonacci Heaps, van Emde Boas Trees, Multithreaded Algorithms, Number Theoretic Algorithms, Strings and String Matching Algorithms, Computational Geometry, Lower Bound Theory–NP Completeness, Approximation Algorithms.

Text books:

1. Anne Benoit, Yves Robert, Frédéric Vivien. A Guide to Algorithm Design: Paradigms, Methods, and Complexity Analysis, Taylor & Francis, 2013.
2. OdedGoldreich. P, NP, and NP-Completeness: The Basics of Computational Complexity, Cambridge University Press, 2010.

Reference books:

1. A.V. Aho, J.E. Hopcroft, and J.D. Ullman, Data Structures and Algorithms, Addison Wesley, Reading Massachusetts, USA, 1983.
2. Donald Knuth. The Art of Computer Programming: Fundamental Algorithms, Third Edition. Addison-Wesley, 1997.
3. Donald Knuth. The Art of Computer Programming Volume 3: Sorting and Searching, Third Edition. Addison-Wesley, 1997. ISBN 0-201-89685-0.
4. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein. Introduction to Algorithms, Third Edition. MIT Press and PHI, 2010.
5. Samet, Hanan, Foundations of multidimensional and metric data structures. Morgan Kaufmann, 2006, ISBN 978-0-12-369446-1.
6. Dinesh Mehta and SartajSahni Handbook of Data Structures and Applications, Chapman and Hall/CRC Press, 2007.
7. M.A. Weiss, Data Structures and Algorithms Analysis in C++, Benjamin/Cummins, Redwood City, California, USA, 1994.

COE-551

System and Network Security

Objectives:

The purpose of this course is to provide understanding of the main issues related to security in modern networked computer systems. This covers underlying concepts and foundations of computer security, basic knowledge about security-relevant decisions in designing IT infrastructures, techniques to secure complex systems and practical skills in managing a range of systems, from personal laptop to large-scale infrastructures.

Learning Outcomes:

On completion of this course, students should have gained a good understanding of the concepts and foundations of computer security, and identify vulnerabilities of IT systems. The students can use basic security tools to enhance system security and can develop basic security enhancements in stand-alone applications.

Syllabus:

Computer Security Concepts- Introduction to Information Security, Introduction to Data and Network Security, Integrity, and Availability, NIST FIPS 199 Standard, Assets and Threat Models, Examples

Control Hijacking– Attacks and defenses, Buffer overflow and control hijacking attacks

Exploitation techniques and fuzzing- Finding vulnerabilities and exploits

Dealing with Legacy code- Dealing with bad (legacy) application code: Sandboxing and Isolation.

Least privilege, access control, operating system security- The principle of least privilege, Access control concepts, Operating system mechanisms, Unix, Windows, Qmail, Chromium, and Android examples.

Basic web security model- Browser content, Document object model (DOM), Same-origin policy.

Web Application Security- SQL injection, Cross-site request forgery, Cross-site scripting, Attacks and Defenses, Generating and storing session tokens, Authenticating users, The SSL protocol, The lock icon, User interface attacks, Pretty Good Privacy.

Network Protocols and Vulnerabilities- Overview of basic networking infrastructure and network protocols, IP, TCP, Routing protocols, DNS.

Network Defenses- Network defense tools, Secure protocols, Firewalls, VPNs, Tor, I2P, Intrusion Detection and filters, Host-Based IDS vs Network-Based IDS, Dealing with unwanted traffic: Denial of service attacks.

Malicious Software and Software Security- Malicious Web, Internet Security Issues, Types of Internet Security Issues, Computer viruses, Spyware, Key-Loggers, Secure Coding, Electronic and Information Warfare.

Mobile platform security models- Android, iOSMobile platform security models, Detecting Android malware in Android markets.

Security Risk Management- How Much Security Do You Really Need, Risk Management, Information Security Risk Assessment: Introduction, Information Security Risk Assessment: Case Studies, Risk Assessment in Practice.

The Trusted Computing Architecture- Introduction to Trusted Computing, TPM Provisioning, Exact Mechanics of TPM.

Text books and References:

1. William Stallings, Network Security Essentials: Applications and Standards, Prentice Hall, 4th edition, 2010.
2. Michael T. Goodrich and Roberto Tamassia, Introduction to Computer Security, Addison Wesley, 2011.
3. William Stallings, Network Security Essentials: Applications and Standards, Prentice Hall, 4th edition, 2010.
4. Alfred J. Menezes, Paul C. van Oorschot and Scott A. Vanstone, Handbook of Applied Cryptography, CRC Press, 2001.

COE-553

Data Privacy

Course objectives:

The objective of this course is to create architectural, algorithmic and technological foundations for the maintenance of the privacy of individuals, the confidentiality of organizations, and the protection of sensitive information, despite the requirement that information be released publicly or semi-publicly.

Learning outcomes:

After successful completion of this course, students will be able to:

- Understand the concepts of privacy in today's environment.
- Obtain the understanding of how automation is changing the concepts and expectations concerning privacy and the increasingly interconnected issue of security.
- Obtain the knowledge of the role of private regulatory and self-help efforts.
- Have an understanding of how emerging issues are affecting society and business, with a concentration on how information security must shape corporate practices.

Syllabus:

Introduction- Fundamental Concepts, Definitions, Statistics, Data Privacy Attacks, Data linking and profiling, access control models, role based access control, privacy policies, their specifications, languages and implementation, privacy policy languages, privacy in different domains- medical, financial, etc.

Data explosion- Statistics and Lack of barriers in Collection and Distribution of Person-specific information, Mathematical model for characterizing and comparing real-world data sharing practices and policies and for computing privacy and risk measurements, Demographics and Uniqueness.

Protection Models- Null-map, k-map, Wrong map

Survey of techniques- Protection models (null-map, k-map, wrong map), Disclosure control, Inferring entity identities, Strength and weaknesses of techniques, entry specific databases.

Computation systems for protecting delimited data- MinGen, Datafly, Mu-Argus, k-Similar, Protecting textual documents: Scrub.

Technology, Policy, Privacy and Freedom- Medical privacy legislation, policies and best practices, Examination of privacy matters specific to the World Wide Web, Protections provided by the Freedom of Information Act or the requirement for search warrants.

Text books and References:

1. B. Raghunathan, The Complete Book of Data Anonymization: From Planning to Implementation, Auerbach Pub, 2013.
2. L. Sweeney, Computational Disclosure Control: A Primer on Data Privacy Protection, MIT Computer Science, 2002.

72

COE-525

Pattern recognition and machine learning

Objective: The aim of this course is to first review the theory of probability and statistics, and then to cover the major approaches of pattern recognition and machine learning.

Learning Outcomes: At the end of this course, students will be able to:

- Identify and describe existing pattern recognition and machine learning approaches for different human interaction modalities (voice, gesture, etc.)
- Discuss and compare different methods for activity recognition along with their strengths and weaknesses
- Evaluate and select the best machine learning approach for the recognition of specific activity
- Compare and identify the best technological solution for designing and implementing a complete activity recognition system based on machine learning approach
- Identify a set of business use--cases using machine learning technology and discuss related advantage and drawbacks

Syllabus:

Parameter Estimation and Classification: Maximum Likelihood Estimation, Maximum A-Posteriori (MAP) Estimation, Maximum Entropy Estimation, Minimum Relative Entropy Estimation, Maximum Mutual Information Estimation (MMIE); Model Selection, Akaike Information Criterion (AIC)Bayesian Information Criterion (BIC); Linear Models for Classification, Discriminant Functions, Two classes, Multiple classes, Least squares for classification, Fisher's linear discriminant, Relation to least squares, Fisher's discriminant for multiple classes, The perceptron algorithm; Probabilistic Generative Models, Continuous inputs, Maximum likelihood solution, Discrete features, Exponential family; Probabilistic Discriminative Models, Fixed basis functions, Logistic regression, Iterative reweighted least squares, Multiclass logistic regression, Probit regression, Canonical link functions.

Clustering and Learning: Learning Algorithms, Risk Minimization, Empirical Risk Minimization, Capacity and Bounds on Risk, Structural Risk Minimization; Decision and Regression Trees, Vector Quantization (VQ); Basic Clustering Techniques, Standard k-Means (Lloyd) Algorithm, Generalized Clustering, Over-partitioning, Merging, Modifications to the k-Means Algorithm, k-Means Wrappers, Rough k-Means, Fuzzy k-Means, k-Harmonic Means Algorithm, Hybrid Clustering Algorithms; Estimation using Incomplete Data, Expectation Maximization (EM); Semi-Supervised Learning.

Kernel Methods and Support Vector Machines: The Two-Class Problem, Dual Representation, Soft Margin Classification; Origins of Kernel methods, Kernel Mapping, The Kernel Trick; Constructing Kernels, Support Vector Machines: Formulation and Computation; Radial Basis Function Networks; Positive Semi-Definite Kernels, Linear Kernel, Polynomial

Kernel, Gaussian Radial Basis Function (GRBF) Kernel, Cosine Kernel, Fisher Kernel, GLDS Kernel, GMM-UBM Mean Interval (GUMI) Kernel.

Text books:

1. HomayoonBeigi ,Fundamentals of Speaker Recognition, Springer,2011
2. K.P. Soman, R.Loganathan, V.Ajay, Machine Learning with SVM and other Kernel methods, PHI Learning Private Limited,2009

Reference books:

1. Christopher M. Bishop ,Pattern Recognition and Machine Learning,Springer,2006
2. Tom Mitchell,Machine Learning, McGraw Hill, 1997.
3. Petra Perner. Machine Learning and Data Mining In Pattern Recognition, Springer Science & Business Media, 2009.

COE-571

Intrusion Detection Systems

Objective: The objective of this course is to provide an in depth introduction to the science and art of intrusion detection. The course covers methodologies, techniques, and tools for monitoring events in computer system or network, with the objective of preventing and detecting unwanted process activity and recovering from malicious behavior.

Learning Outcomes:

At the end of this course, students will be able to:

- Obtain comprehensive knowledge on the subject of intrusion detection
- Understand the state of the art of intrusion detection research
- Get a hands-on exposure to the principles and techniques used in intrusion detection, as well as the technical challenges and fundamental limitations of intrusion detection
- become either a capable practitioner or independent researcher in intrusion detection

Syllabus:

Overview of intrusions, system intrusion process, dangers of system intrusions, history and state of the art of intrusion detection systems (IDSs): anomaly detection, misuse detection, types of IDS: Network-Based IDS. Host-Based IDS, Hybrid IDS, Intrusion Prevention Systems (IPS): Network-Based IPS, Host-Based IPS, Intrusion Detection Tools, the limitations and open

problems of intrusion detection systems, advanced persistent threats, case studies of intrusion detection systems against real-world threats and malware.

Statistical and machine approaches to detection of attacks on computers - Techniques for studying the Internet and estimating the number and severity of attacks, network based attacks, host based attacks. Statistical pattern recognition for detection and classification of attacks, and techniques for visualizing network data, etc.

Text books:

1. Roberto Di Pietro, Luigi V. Mancini, Intrusion Detection System, Springer ,2008

Reference books:

1. Anderson, Ross (2001). Security Engineering: A Guide to Building Dependable Distributed Systems. New York: John Wiley & Sons. pp. 387–388. ISBN 978-0-471-38922-4.
2. Anderson, James P., "Computer Security Threat Monitoring and Surveillance," Washing, PA, James P. Anderson Co., 1980.

COE-573

Information Theory and Coding

Objective:

The objective of this course is to introduce the basic concepts of information theory and coding, including information, source coding, channel model, channel capacity, channel coding and so on.

Learning Outcomes:

The students at the end of the course will be able to:

- Understand and explain the basic concepts of information theory, source coding, channel and channel capacity, channel coding and relation among them.
- Describe the real life applications based on the fundamental theory.
- Calculate entropy, channel capacity, bit error rate, code rate, steady-state probability and so on.
- Implement the encoder and decoder of one block code or convolutional code using any program language

Syllabus:

Overview; Basic Concepts - Entropy and Mutual information; Lossless Source Coding – Source entropy rate; Kraft inequality; Huffman code; Asymptotic equipartition property; Universal coding; Noisy Channel Coding - Channel capacity; Random channel codes; Noisy channel

75

coding theorem for discrete memory-less channels; Typical sequences; Error exponents; Feedback; Continuous and Gaussian channels; Lossy Source Coding - Rate- Distortion functions; Random source codes; Joint source-channel coding and the separation theorem.
Source coding- Text, Audio and Speech: Adaptive Huffman Coding, Arithmetic Coding, LZW algorithm – Audio: Perceptual coding, Masking techniques, Psychoacoustic model, MEG Audio layers I,II,III, Dolby AC3 - Speech: Channel Vocoder, Linear Predictive Coding

Source coding- Image and Video: Image and Video Formats – GIF, TIFF, SIF, CIF, QCIF – Image compression: READ, JPEG – Video Compression: Principles-I,B,P frames, Motion estimation, Motion compensation, H.261, MPEG standard

Error control coding- Block codes: Definitions and Principles: Hamming weight, Hamming distance, Minimum distance decoding - Single parity codes, Hamming codes, Repetition codes - Linear block codes,

Cyclic codes - Syndrome calculation, Encoder and decoder – CRC

Error control coding- convolution codes: code tree, trellis, state diagram - Encoding – Decoding: Sequential search and Viterbi algorithm – Principle of Turbo coding

Text books:

1. Mark Kelbert(Author), Yuri Suhov, Information Theory and Coding by Example, Cambridge University Press,2013

Reference books:

1. Simon Haykin and Michael Moher, Communication Systems, 5th Edition, Wiley, 2010
2. T.M. & Thomas, J.A. (2006). Elements of information theory. New York: Wiley.
3. Ad'amek, Foundations of coding, Wiley Interscience, 1991.
4. T. M. Cover and J. A. Thomas, Elements of information theory, Wiley, 1991.

COE-575

Cloud computing and big data

Objective:

Objective of this course is to understand the advantages, challenges, security issues of cloud computing and interrelationships between cloud computing and big data.

Learning Outcomes:

At the end of this course, students will be able to:

- Explain the core concepts of the cloud computing paradigm: how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing.
- Apply the fundamental concepts in datacenters to understand the tradeoffs in power, efficiency and cost.
- Identify resource management fundamentals, i.e. resource abstraction, sharing and sandboxing and outline their role in managing infrastructure in cloud computing.
- Illustrate the fundamental concepts of cloud storage and demonstrate their use in storage systems such as Amazon S3 and HDFS.
- Analyze various cloud programming models and apply them to solve problems on the cloud.

Syllabus:

Cloud Computing Fundamentals: What Cloud Computing, Essential Characteristics, Architectural Influences, Technological Influences.

Cloud Computing Architecture: Cloud Delivery Models, Cloud Deployment Models, Expected Benefits.

Cloud Computing Software Security Fundamentals: Cloud Information Security Objectives, Cloud Security Services, Relevant Cloud Security Design Principles, Secure Cloud Software Requirements.

Cloud Computing Risk Issues: Privacy and Compliance Risks, Threats to Infrastructure, Data, and Access Control, Cloud Service Provider Risks,

Cloud Computing Security Challenges: Security Policy Implementation, Virtualization Security Management, VM Security Recommendations, VM-Specific Security Techniques.

Cloud Computing Security Architecture: Architectural Considerations, Identity Management and Access Control, Autonomic Security.

Data storage in the cloud: Understanding cloud-based data storage, cloud-based backup system, Understanding File storage, Industry specific cloud-based data storage, Cloud-based database solutions, Cloud-based block storage.

Collaboration in the cloud: Web based collaborations, Collaborating via web Logs(Blogs), Using social media for collaboration, Using streaming video content to collaborate.

Text books:

1. Kris Jamsa, Cloud Computing, Jones & Bartlett,2012
2. Russell Dean Vines and Ronald L. Krutz ,Cloud Security: A Comprehensive Guide To Secure Cloud Computing, Wiley India Pvt Ltd, 2010

Reference books:

1. Barrie Sosinsky, Cloud Computing Bible, Wiley India,2011

77

COE-577

Vulnerability Discovery & Exploit Development

Objectives:

Objective of this course is to focus on a comprehensive coverage of software exploitation. In addition, this course will present different domains of code exploitation and how they can be used together to test the security of an application.

Learning Outcome:

Upon completion of this course, students will be able to:

- Understand how to exploit a program and different types of software exploitation techniques
- Understand the exploit development process
- Search for vulnerabilities in closed-source applications
- Write their own exploits for vulnerable applications

Syllabus:

Background- Vulnerability Discovery Methodologies, What is Fuzzing, Fuzzing Methods and Fuzzer Types, Data Representation and Analysis, Requirements for Effective Fuzzing

Targets and Automation- Automation and Data Generation, Environment Variable and Argument Fuzzing, Environment Variable and Argument Fuzzing: Automation, Web Application and Server Fuzzing, Web Application and Server Fuzzing: Automation, File Format Fuzzing, File Format Fuzzing: Automation on UNIX, File Format Fuzzing: Automation on Windows, Network Protocol Fuzzing, Network Protocol Fuzzing: Automation on UNIX, Network Protocol Fuzzing: Automation on Windows, Web Browser Fuzzing, Web Browser Fuzzing: Automation, In-Memory Fuzzing, In-Memory Fuzzing: Automation

Advanced Fuzzy Technologies- Fuzzing Frameworks, Automated Protocol Dissection, Fuzzer Tracking, Intelligent Fault Detection.

Advanced Linux Exploitation-Linux heap management, constructs, and environment, Navigating the heap, Abusing macros such as unlink() and frontlink(), Function pointer overwrites, Format string exploitation, Abusing custom doubly-linked lists, Defeating Linux exploit mitigation controls, Using IDA for Linux application exploitation, Patch Diffing, one day Exploits and Return Oriented Shellcode, The Microsoft patch management process and Patch Tuesday, Obtaining patches and patch extraction, Binary diffing with BinDiff, patchdiff2, turbodiff, and darungrim, Visualizing code changes and identifying fixes, Reversing 32-bit and

64-bit applications and modules, Triggering patched vulnerabilities, Writing one-day exploits, Handling modern exploit mitigation controls.

Windows Kernel Debugging and Exploitation- Understanding the Windows Kernel, Navigating the Windows Kernel, Modern Kernel protections, Debugging the Windows Kernel, WinDbg, Analysing Kernel vulnerabilities and Kernel vulnerability types, Kernel exploitation techniques.

Windows Heap Overflows and Client-Side Exploitation- Windows heap management, constructs, and environment, Browser-based and client-side exploitation, Remedial heap spraying, Understanding C++, vftable/vtable behavior, Modern heap spraying to determine address predictability, Use-After-Free attacks and dangling pointers, Determining exploitability, Defeating ASLR, DEP, and other common exploit mitigation controls

Android Exploitation- Android Basics, Android Security Model, Introduction to ARM, Android Development Tools, Engage with Application Security, Android Security Assessment Tools, Exploiting Applications, Protecting Applications, Secure Networking, Native Exploitation and Analysis.

iOS exploitation-Introduction to iOS hacking, iOS User Space Exploitation, iOS Kernel Debugging and Exploitation

Text books and References:

1. Hack I.T. - Security Through Penetration Testing, T. J. Klevinsky, Scott Laliberte and Ajay Gupta, Addison-Wesley, ISBN: 0-201-71956-8
2. Metasploit: The Penetration Tester's Guide, David Kennedy, Jim O'Gorman, Devon Kearns, Mati Aharoni
3. Professional Penetration Testing: Creating and Operating a Formal Hacking Lab, Thomas Wilhelm

COE-579

Game Theory

Course Objectives:

Objective of the course is to teach students some strategic considerations to take into account making their choices. In addition, aim is to predict how other people or organizations behave when they are in strategic settings and to apply these tools to settings from economics and from elsewhere.

Learning Outcomes:

After successful completion of this course, students will be able to:

- Train in the logic and strategic decision making involved in the theory of games.
- To solve strategic games between two and more agents in non-cooperative scenario.

64-bit applications and modules, Triggering patched vulnerabilities, Writing one-day exploits, Handling modern exploit mitigation controls.

Windows Kernel Debugging and Exploitation- Understanding the Windows Kernel, Navigating the Windows Kernel, Modern Kernel protections, Debugging the Windows Kernel, WinDbg, Analysing Kernel vulnerabilities and Kernel vulnerability types, Kernel exploitation techniques.

Windows Heap Overflows and Client-Side Exploitation- Windows heap management, constructs, and environment, Browser-based and client-side exploitation, Remedial heap spraying, Understanding C++, vftable/vtable behavior, Modern heap spraying to determine address predictability, Use-After-Free attacks and dangling pointers, Determining exploitability, Defeating ASLR, DEP, and other common exploit mitigation controls

Android Exploitation- Android Basics, Android Security Model, Introduction to ARM, Android Development Tools, Engage with Application Security, Android Security Assessment Tools, Exploiting Applications, Protecting Applications, Secure Networking, Native Exploitation and Analysis.

iOS exploitation-Introduction to iOS hacking, iOS User Space Exploitation, iOS Kernel Debugging and Exploitation

Text books and References:

1. Hack I.T. - Security Through Penetration Testing, T. J. Klevinsky, Scott Laliberte and Ajay Gupta, Addison-Wesley, ISBN: 0-201-71956-8
2. Metasploit: The Penetration Tester's Guide, David Kennedy, Jim O'Gorman, Devon Kearns, Mati Aharoni
3. Professional Penetration Testing: Creating and Operating a Formal Hacking Lab, Thomas Wilhelm

COE-579

Game Theory

Course Objectives:

Objective of the course is to teach students some strategic considerations to take into account making their choices. In addition, aim is to predict how other people or organizations behave when they are in strategic settings and to apply these tools to settings from economics and from elsewhere.

Learning Outcomes:

After successful completion of this course, students will be able to:

- Train in the logic and strategic decision making involved in the theory of games.
- To solve strategic games between two and more agents in non-cooperative scenario.

- To analyze and solve both simultaneous-moves and sequential-moves games and will be familiarized with different solution concepts..
- Learn different methods to solve games.
- Apply the concepts and ideas that constitute these various game types and their solutions, and apply them to the problems at hand.

Syllabus:

Introduction- Fundamental Concepts, Definitions, and Classification of Games.
Games with Sequential moves-Game tree representation, Actions & Strategies, Advantage in moving first or last, Backward Induction.
Simultaneous moves Games (Pure strategies)-Normal form representation, Nash equilibrium, Dominance, Minimax solution concept for ZerosumGames, Rationalizability, Multiple equilibria, No equilibria, Discrete and Continuous strategies, 3-player games.
Simultaneous and Sequential moves Games- Converting game trees to Normal form, and vice versa. Changing order of moves, Games withboth Sequential and Simultaneous moves.
Simultaneous moves games (Mixed strategies)-Mixing to keep the opponent guessing, Mixing in non-Zero-sum games, Expected values &utility, Mixing with 3 strategies.
Prisoners' Dilemma, Repeated Games and Collective Action- Finite and Infinite repetition, Leadership, Folk Theorem, Application: Price Matching, CollectiveAction and Inaction.
Strategic Moves- Credibility, Commitments, Threats, Promises, Burning Bridges.
Application Voting-Voting Rules, Paradoxes, Strategic Manipulation.
ApplicationBargaining-Nash Bargaining Solution, Ultimatum game, Alternating-offers game, Threat Points, Bargaining Shares.

Text books and References:

1. Dixit and B. Nalebuff. Thinking Strategically, Norton 1991
2. J. Watson. Strategy: An Introduction to Game Theory, Norton 2002
3. P.K. Dutta. Strategies and Games: Theory And Practice, MIT 1999

COE-531

Distributed Computing

Objective:

To understand fundamental concepts of distributed computing and to acquire knowledge about development of fault tolerant protocols for middleware design.

Learning Outcomes:

After completion of this course, student should be able to apply these course concepts to:

- Develop, test and debug RPC based client-server programs in Unix.

80

- Design and build application programs on distributed systems.
- Improve the performance and reliability of distributed programs.
- Design and build newer distributed file systems for any OS.

Syllabus:-

Fundamental issues in Distributed Systems, Distributed System Models and Architectures, Classification of Failures in Distributed Systems, Basic Techniques for Handling Faults in Distributed Systems, Logical and Physical Clocks, Physical Clock Synchronization, Interprocess Communication, Message Ordering Protocols, Naming in Distributed Systems, Global State, Termination, and Distributed Deadlock Detection, Distributed Mutual Exclusion, Leader Election, Agreement Protocols, Consensus, FLP impossibility, Fault-Tolerance Issues, Z-path and Z-cycles, Byzantine Generals Problem, Distributed Scheduling and Load Balancing. Distributed File Systems, and Distributed Shared Memory, Security.

Text books:

1. Ajay D. Kshemkalyani, Mukesh Singhal, Distributed Computing: Principles, Algorithms, and Systems, Cambridge University Press, 2011.
2. Su Kumar Boss, Distributed Systems and Algorithmic Approach, Chamal & Hall,2006

Reference books:

1. G Colouris, J Dollimore, T Kindberg , Distributed Systems :Concepts and Design; 3/e, Pearson Ed. 2002.
2. Distributed Systems: Principles and Paradigm; Andrew S Tanenbaum, Maarten van Steen 3/e Pearson Ed. 2002.
3. Principles of Distributed Systems, VK Garg, Kluwer Academic Publishers, 1996.

COE-581

System & Device Driver Programming

Objective:

This subject aims to start with the study of system resource management and deals with the programming aspects of the operating system and extending its functionality alongwith the use of device driver to interact with real hardware components.

Learning Outcomes:

After successful completion of this course, students will be able to:

- Write System Software
- Understand purpose, types and configuration of device drivers

- Implement different System Calls
- Do advanced file and process management

Syllabus:

Introduction, Lab & Software Setup, Windows Driver Model Overview, Windows Basic Device Driver Implementation (IRQL, Memory Pool), Debugging Kernel mode driver and Windows/Linux/OSX Boot Process With WinDbg and KD IDApro, IOCTL implementation, File System/Network/Keyboard Filter Driver, TDI/Winsock driver Implementation, NDIS 6.1 TCP/IP Stack Implementation, Introduction to Display Drivers, Drivers for Enumerating File/Process/Port/Registry (Assuagement for hiding), File System Implementation, Bus/DMA Driver, Linux Driver Introduction, Enumeration of Process file and registry and port, MAC/OSX Driver Introduction, Enumeration of Process file and registry and port.

Text books and References:

1. R. Love, Linux System Programming: Talking Directly to the Kernel and C Library. O'Reilly Media, Inc., 2013.
2. Russinovich, Solomon, "Windows Internals". Microsoft Press, 4thEdition, 2012.
3. N. Wilt, The CUDA Handbook: A Comprehensive Guide to GPU Programming.Reading, MA, USA: Addison-Wesley, 2013.
4. M. Barr and A. Massa, Programming Embedded Systems: With C and GNU Development Tools, 2nd ed. Sebastopol, CA:O'Reilly, 2006.

COE-583

Information Warfare

Objective:

This course addresses some of the unique and emerging policy, doctrine, strategy, and operational requirements of conducting cyber warfare at the nation-state level. It provides students with a unified battle-space perspective and enhances their ability to manage and develop operational systems and concepts in a manner that results in the integrated, controlled, and effective use of cyber assets in warfare.

Learning Outcomes:

On completion of this course, students should be able to:

- explain the theory of data, information and knowledge as they pertain to information warfare
- apply strategies of using information as a weapon and a target
- apply the principles of offensive and defensive information warfare for a given context
- discuss the social, legal and ethical implications of information warfare

- evaluate contemporary information warfare concepts for their application in a corporate environment

Syllabus:

Introduction and Models of Information Warfare- Information Resources, The Value of Resources, Players, The Offense, The Defense, A Dual Role, Offensive Information Warfare, Increased Availability to Offensive Player, Decreased Availability to Defensive Player, Decreased Integrity, Other Classification Schemes, Defensive Information Warfare, Types of Defense, Information Security and Information Assurance, The CIA Model and Authorization, Playgrounds to Battlegrounds, Play, Motivation, Culture, More than Child's Play, Intellectual Property Crimes, Fraud, Computer Fraud and Abuse. Fighting Crime, Individual Rights, National Security, Foreign Intelligence, War and Military Conflict, Terrorism, Netwars, Protecting National Infrastructures.

Open Sources- Open Source and Competitive Intelligence, Privacy, Snooping on People Through Open Sources, Web Browsing, Privacy Regulations, Piracy, Copyright Infringement, Trademark Infringement, Dark Sides.

Psyops and Perception Management- Lies and Distortions, Distortion, Fabrication, Hoaxes, Social Engineering, Denouncement, Conspiracy Theories, Defamation, Harassment, Advertising, Scams, Spam Wars, Censorship, United States Restrictions.

Inside the Fence- Traitors and Moles, State and Military Espionage, Economic Espionage, Corporate Espionage, Privacy Compromises, Business Relationships, Visits and Requests, Fraud and Embezzlement, Bogus Transactions, Data Diddling, Inside Sabotage, Physical Attacks, Software Attacks, Penetrating the Perimeter, Physical Break-ins and Burglaries, Search and Seizure, Dumpster Diving, Bombs.

Computer Break-Ins and Hacking- Accounts, Getting Access, Tools and Techniques, A Demonstration, Network Scanners, Packet Sniffers, Password Crackers, Buffer Overpows and Other Exploits, Social Engineering, Covering up Tracks, Information Theft, Gathering Trophies, More than Trophies, Tampering, Web Hacks, Domain Name Service Hacks, Takedown, Remote Shutdown Extent.

Text books:

1. Daniel Ventre, Cyberwar and Information Warfare, John Wiley & Sons.2012
2. Daniel Ventre, Information Warfare, Wiley - ISTE (2009) (ISBN 9781848210943).

Reference books:

1. Information Warfare and Security, Dorothy E. Denning, Denning Edition 1, 1998 Addison-Wesley.
2. Dorothy Denning, Information Warfare and Security, Addison-Wesley (1998.)

83

COE-585

Mobile and Wireless Network Security

Objective:

The main learning objectives of this course are: To conceptualize the wireless environment idiosyncrasies in terms of security and privacy; to impart state-of-the-art technologies of wireless network security; to analyze the various categories of threats, vulnerabilities, countermeasures in the area of wireless and mobile networking; to familiarize students with the issues and technologies involved in designing a wireless system that is robust against attacks.

Learning Outcomes:

On completion of this course, students should be able to:

- attain knowledge of advanced security and privacy issues in wireless systems, including cellular and wireless LAN and MAN networks
- impart state-of-the-art technologies and protocols of wireless network security
- identify and investigate in-depth both early and contemporary threats to mobile and wireless networks security
- to apply proactive and defensive measures to deter and repel potential threats, attacks and intrusions
- to develop an understanding of security issues towards 4G architectures

Syllabus:

Wired/wireless networks; Effect of mobility on networks and systems; impact on IP stack from MAC layer and up; ad-hoc and sensor networks; wireless broadcast, IP broadcast, Satellite broadcast; issues of information capacity; distinction between wired and wireless networks from information theory; Issues of security in wireless; issues of 802.11 protocols; routing in wireless networks, design of secure protocols: key distribution for access control, source authentication of transmissions, and non-repudiation; Power management and selfishness issues, attacks in wireless networks; DoS and DDoS attacks, reaction to attacks, information processing for sensor networks.

Text books:

1. Lei Chen, Jiahuang Ji, Zihong Zhang, Wireless Network Security, Springer Science & Business Media,2013
2. Noureddine Boudriga, Security of Mobile Communications, 2010.

Reference books:

1. Levente Buttyán and Jean-Pierre Hubaux, Security and Cooperation in Wireless Networks, 2008. [Available Online]
2. James Kempf, Wireless Internet Security: Architectures and Protocols, 2008.

3. Patrick Traynor, Patrick McDaniel, and Thomas La Porta, Security for Telecommunications Networks, 2008.
4. Frank Adelstein, Sandeep K.S. Gupta, Golden G. Richard III, and Loren Schwiebert, Fundamentals of Mobile and Pervasive Computing, 2005.

COE-587

Secure Coding

Course Objective: This course aims to provide an understanding of the various security attacks and knowledge to recognize and remove common coding errors that lead to vulnerabilities. It gives an outline of the techniques for developing a secure application.

Learning Outcomes

On successful completion of this course, students will be able to:

- To implement security as a culture and show mistakes that make applications vulnerable to attacks.
- To understand various attacks like DoS, buffer overflow, web specific, database specific, web-spoofing attacks.
- To demonstrate skills needed to deal with common programming errors that lead to most security problems and to learn how to develop secure applications.
- To identify the nature of the threats to software and incorporate secure coding practices throughout the planning and development of the product.
- Able to properly handle application faults, implement secure authentication, authorization and data validation controls used to prevent common vulnerabilities.

Syllabus:

Introduction: Security, CIA Triad, Viruses, Trojans, and Worms In a Nutshell, Security Concepts- exploit, threat, vulnerability, risk, attack. Malware Terminology: Rootkits, Trapdoors, Botnets, Key loggers, Honeypots. Active and Passive Security Attacks. IP Spoofing, Tear drop,DoS, DDoS,XSS, SQL injection, Smurf, Man in middle, Format String attack. Types of Security Vulnerabilities- buffer overflows, Invalidated input, race conditions, access-control problems, weaknesses in authentication, authorization, or cryptographic practices. Access Control Problems.

Need for secure systems: Proactive Security development process, Secure Software Development Cycle (S-SDLC) , Security issues while writing SRS, Design phase security, Development Phase, Test Phase, Maintenance Phase, Writing Secure Code – Best Practices SD3 (Secure by design, default and deployment), Security principles and Secure Product Development Timeline.

Threat modelling process and its benefits: Identifying the Threats by Using Attack Trees and rating threats using DREAD, Risk Mitigation Techniques and Security Best Practices. Security techniques, authentication, authorization. Defence in Depth and Principle of Least Privilege.

Secure Coding Techniques: Protection against DoS attacks, Application Failure Attacks, CPU Starvation Attacks, Insecure Coding Practices In Java Technology. ARP Spoofing and its countermeasures. Buffer Overrun- Stack overrun, Heap Overrun, Array Indexing Errors,FormatString Bugs. Security Issues in C Language: String Handling, Avoiding Integer Overflows and Underflows and Type Conversion Issues- Memory Management Issues, Code Injection Attacks,Canary based countermeasures using StackGuard and Propolice. Socket Security, Avoiding Server Hijacking, Securing RPC, ActiveX and DCOM

Database and Web-specific issues: SQL Injection Techniques and Remedies,Race conditions, Time of Check Versus Time of Use and its protection mechanisms. Validating Input and Interprocess Communication, Securing Signal Handlers and File Operations. XSS scripting attack and its types – Persistent and Non persistent attack XSS Countermeasures and Bypassing the XSS Filters.

Testing Secure Applications: Security code overview, secure software installation. The Role of the Security Tester, Building the Security Test Plan. Testing HTTP-Based Applications, Testing File-Based Applications, Testing Clients with Rogue Servers

Text books and References:

1. Writing Secure Code, Michael Howard and David LeBlanc,Microsoft Press, 2nd Edition, 2004
2. Buffer Overflow Attacks: Detect, Exploit, Prevent by Jason Deckar,Syngress,1st Edition, 2005
3. Threat Modeling, Frank Swiderski and Window Snyder,Microsoft Professional, 1st Edition, 2004.

COE-589

Special Topics in Security-I

Course Objectives:

Objective of this course is to:

- Provide information to the students regarding emerging web application vulnerabilities.
- Deliver the information regarding tools which are utilized for the exploitation of the cyber security vulnerabilities.
- Secure both clean and corrupted systems, protecting personal data, securing simple computer networks, and safe Internet usage.
- Understand key terms and concepts in cyber law, intellectual property and cyber crimes, trademarks and domain theft.
- Determine computer technologies, digital evidence collection, and evidentiary reporting in forensic acquisition.

Learning Outcomes

Upon completion of this course, students will be able to:

- Describe and analyze the hardware, software, components of a network and the interrelations.
- Explain networking protocols and their hierarchical relationship hardware and software. Compare protocol models and select appropriate protocols for a particular design.
- Manage multiple operating systems, systems software, network services and security. Evaluate and compare systems software and emerging technologies.
- Develop solutions for networking and security problems, balancing business concerns, technical issues and security.
- Explain concepts and theories of networking and apply them to various situations, classifying networks, analyzing performance and implementing new technologies.

Syllabus:

Internet of Things (IOT): IoT architectures, IoT enabling technologies, IoT Big Data Analytics, IoT security and privacy concerns.

Computing paradigms: Virtualization Vulnerabilities, Hypervisor Security-Related Issues, Side Channel Attacks, Data Segregation, ubiquitous, grid, cloud, pervasive, green, ad hoc (*mobile, vehicular, flying*) networks.

Spear Phishing: Advanced Persistent Threats, Reconnaissance.

Digital Rights Management (DRM): Usage Rights, Rights Expression Language, Open Digital Rights Language.

Android-based Smartphone Security, Stepping Stone Detection, Broken Authentication and Session Management Vulnerabilities, Computer Forensic Investigation, Cyber Terrorism.

Text books and References:

1. Gunter Ollmann 2007. The Phishing Guide Understanding & Preventing Phishing Attacks. IBM Internet Security Systems.
2. Thomas Erl, Ricardo Puttini, ZaighamMahmood, Cloud Computing: Concepts, Technology & Architecture, Prentice Hall, 2013.
3. RajkumarBuyya, Christian Vecchiola, S. ThamaraiSelvi, Mastering Cloud Computing, Tata McGraw-Hill Education, 2013.
4. M. N. Omar et al, "Hybrid Stepping Stone Detection Method," in the proceeding of 1st IEEE Conference on Distributed Framework and Applications (DFmA – 2008), pp. 134–138, 2008
5. J. Yang, Shou-Hsuan Stephen Huang, "Matching TCP packets and its application to the detection of long connection chains on the Internet," in the proceeding of 19th IEEE International Conference on Advanced Information Networking and Applications (AINA), pp. 1005-1010,2005
6. Rosenblatt B., Tripp B., Mooney S., "Digital Rights Management: Business and Technology", John Wiley & Sons, 2001.

87

COE-552

Number Theory and Cryptology

Objective:

The objective of this course is:

- To introduce the student to elementary number theory, as required for further study of important cryptographic protocols.
- To introduce the student to the fundamentals of modern symmetric cryptography.
- To enable the student to appreciate the significance of cryptography as a means of securing information in the modern world.

Learning Outcomes:

On successful completion of this course, students will be able to:

- Understand the significance of cryptography to the modern world and the internet.
- Understand the rationale behind block cipher design.
- Perform the cryptanalysis of a simple block cipher.
- Integrate cryptographic algorithms into software projects.
- Solve elementary problems in number theory relating to cryptography.
- Build on number theoretic basics to further their knowledge of advanced methods of cryptography.

Syllabus:

Basic Cryptography Concepts- Basic Cryptography Concepts: Symmetric Encryption Algorithms, Purpose of Cryptography, Data Encryption Standard (DES), Triple DES, Advanced Encryption Standard (AES).

Classical methods: Caesar cipher, Vigenere cipher, The one-time pad, Mechanical rotor systems

Modern ciphers: Block ciphers and their applications, Structure of a block cipher, The Fiestel structure, Key and block size length, The Data Encryption Standard (DES), The Advanced Encryption Standard (AES)

Hash Functions: One-way hash functions and their applications, SHA-1 and its successors.

Cryptanalysis: Linear cryptanalysis, Differential cryptanalysis, Meet-in-the-middle attacks.

Key Distribution: The key distribution problem, The Diffie-Hellman method, RSA and related methods

Elementary Number Theory: Finite fields, Modular arithmetic, Efficient algorithms for modular arithmetic, Fermat's little theorem, Euler's criteria, Euler's totient function

Advanced Number Theory: Primality testing, prime factorisation, The Chinese remainder theorem, Quadratic residues and calculating modular square roots and cube roots, The Jacobi symbol

Text Books:

1. A Course in Number Theory and Cryptography, Â Neal Koblitz, (Springer 2006)

2. An Introduction to Mathematical Cryptography, Jill Pipher, Jeffrey Hoffstein, Joseph H. Silverman (Springer, 2008)
3. An Introduction to theory of numbers, Niven, Zuckerman and Montgomery, (Wiley 2006)
4. Elliptic curves: number theory and cryptography, Lawrence C. Washington, (Chapman & Hall/CRC 2003)

Reference Books:

1. An Introduction to Cryptography, R.A. Mollin (Chapman & Hall, 2001)
2. Rational Points on Elliptic Curves, Silverman and Tate (Springer 2005)
3. Guide to elliptic curve cryptography Hankerson, Menezes, Vanstone (Springer, 2004)
4. Elementary Number Theory, Jones and Jones (Springer, 1998)

COE-554

Introduction to Cyberspace Operations and Design

Objective:

This course provides a basic understanding of full-spectrum cyberspace operations, the complexities of the cyberspace environment, as well as planning, organizing, and integrating cyberspace operations. The course will consist of presentations and exercises that will teach students how to develop a cyber-operations design and bring it to fruition. At the conclusion of the course, students will have a fundamental understanding of how to analyze, plan for, and execute cyberspace operations.

Learning Outcomes:

In this course, students will gain a better understanding of cyber operations (CO) for the deployment of computer network attack (CNA), computer network defense (CND), and computer network exploitation (CNE), against an adversary to achieve objectives and cause effects in support of a mission set.

This course, founded on concept operations and real cyber capabilities, provides students with the understanding, tools, and processes needed to conduct malware analysis with real-world malicious code samples to dissect. Students will be able to prepare and plan an effective offensive and defensive strategy, as well as evaluate covert protocols. Analysis of system specific, non-descript tools will be introduced to aid in attack and defense. After attending this course students will have the knowledge of following topics

1. Understanding of Cyberspace Environment and Design
2. Cyberspace Operational Approaches
3. Cyberspace Operations
4. Cyberspace Integration
5. Building Cyber Warriors and Warrior Corps
6. Designing Cyber Related Command
7. Training and Readiness for Cyber Related Commands

Syllabus:

Understanding the Cyberspace Environment and Design- Cyberspace environment and its characteristics, Developing a design approach, Planning for cyberspace operation

Cyberspace Operational Approaches- Foundational approaches that utilize cyberspace capabilities to support organizational missions, The pros and cons of the different approaches

Cyberspace Operations- Network Operations (NETOPS), Defensive Cyberspace Operations (DCO), Offensive Cyberspace Operations (OCO), Defense and Diversity of Depth network design, Operational methodologies to conduct cyberspace operations

Cyberspace Integration- Design a cyberspace operation and integrate it with a Joint Operations plan, Practice the presented methodologies in a practical application exercise

Building Cyber Warriors and Warrior Corps- The warrior and warrior corps concept as applied to cyber organizations, The challenges of training and developing a cyber-workforce from senior leadership to the technical workforce

Designing Cyber Related Commands- Mission statements, Essential tasks, Organizational structures, Tables of organizations

Training and Readiness for Cyber Related Commands- Mission Essential Tasks (METs), Developing the cyber workforce, Plan your own training programs within your organization.

Text books and References:

1. Paulo Shakarian et al. "Introduction of Cyber Warfare: A Multidisciplinary Approach," syngress, Elsevier 2013.
2. Jeffery carr et al, "Inside Cyber Warfare: Mapping the Cyber Underworld," O'Reilly Publication December 2012.
3. Jason Andress et al. "Cyber Warfare: Techniques, Tactics and Tools for Security Practitioners" Syngress, Elsevier 2013.
4. R. A. Clarke, Robert Knake "Cyber War: The Next Threat to National Security and What to Do About It" Haper Collins Publisher 2010.

COE-524

Soft Computing

Objective:-This syllabus covers the different domains of soft computing techniques like neural networks, fuzzy logic, genetic algorithm and swarm optimization.

Learning Outcomes:- After completion of this course, students will be able design robust and low-cost intelligent machines.

Syllabus:-

Soft Computing and Artificial Intelligence: Introduction of Soft Computing, Soft Computing vs. Hard Computing, Various Types of Soft Computing Techniques, Applications of Soft Computing, AI Search Algorithm, Predicate Calculus, Rules of Interference, Semantic Networks, Frames, Objects, Hybrid Models.

Artificial Neural Networks and Paradigms : Introduction, Neuron Model, Neural Network Architecture, Learning Rules, Perceptrons, Single Layer Perceptrons, Multilayer Perceptrons, Back propagation Networks: Kohnen'sself organizing networks, Hopfield network, Applications of NN.

Fuzzy Logic: Introduction, Fuzzy sets and Fuzzy reasoning, Basic functions on fuzzy sets, relations, rule based models and linguistic variables, fuzzy controls, Fuzzy decision making, applications of fuzzy logic.

Neuro - Fuzzy Modeling : Adaptive Networks Based Fuzzy Interface Systems, Classification and Regression Trees, Data Clustering Algorithms, Rule Based Structure Identification, Neuro-Fuzzy Controls, Simulated Annealing, Evolutionary Computation.

Genetic Algorithms and Swarm Optimizations: Introduction, Genetic Algorithm, Fitness Computations, Cross Over, Mutation, Evolutionary Programming, Classifier Systems, Genetic Programming Parse Trees, Variants of GA, Applications, Ant Colony Optimization, Particle Swarm Optimization, Artificial Bee Colony Optimization.

Text books:

1. Srikanta Patnaik, Baojiang Zhong, Soft Computing Techniques in Engineering Applications,Springer 2014
2. Anupam Shukla, Real Life Applications of Soft Computing, CRC Press, 2010

Reference books:

1. Saroj Kaushik, Artificial Intelligence, Cengage Learning, 2007.
2. Zimmermann, "Fuzzy Set Theory and its Application", 3rd Edition, 2001.
3. Jang J.S.R., Sun C.T. and Mizutani E, "Neuro-Fuzzy and Soft computing", Prentice Hall, 1998.
4. Timothy J. Ross, "Fuzzy Logic with Engineering Applications", McGraw Hill, 1997.
5. D.E. Goldberg, "Genetic Algorithms: Search, Optimization and Machine Learning", Addison Wesley, N.Y, 1989.

COE-572

Biometric Security

Objective:

To provide students with understanding of biometrics, biometric equipment and standards applied to security

Learning Outcomes:

Successful completion of this course will prepare the students to:

- Explain different biometrics parameters
- Evaluate and design security systems incorporating biometrics
- Perform R&D on biometrics methods and systems
- Understand the privacy challenges of Biometrics
- Explain the errors generated in biometric measurements
- Understand the technology of biometrics for public policy matters involving security and privacy.

Syllabus:

Overview of Biometrics: Definitions, biometric modalities, basic applications, access control, security

Biometric System Architecture: Scanning/digitizing, enhancement, feature extraction, classification, matching, searching and verification.

Probability, statistics and estimation Random variables, discrete and continuous distribution - pattern classification and recognition - Signals in time and frequency domain – multivariate statistical analysis.

Algorithms Face recognition Voice Recognition Fingerprint Recognition Iris Recognition

Other biometric modalities: Retina, signature, hand geometry, gait, keystroke

Quantitative analysis on the biometrics, Performance evaluation in Biometrics – false acceptance rate; false rejection rate.

Multimodal Biometric systems Biometric system integration, multimodal biometric systems: theory and applications, performance evaluation of multimodal biometric systems.

Biometric System Security: Biometric attacks/tampering; solutions; biometric encryption;

Text books:

1. Benjamin Muller, Security, Risk and the Biometric State: Governing Borders and Bodies, 1st Edition, Routledge, 2010.
2. Anil K jain, Patrick Flynn, Arun A. (Eds.), Handbook of Biometrics, Springer, 2008.

Reference books:

1. Julian D. M. Ashbourn, Biometrics: Advanced Identify Verification: The Complete Guide, Springer-verlag, 2000.
2. Davide Maltoni, Handbook of Fingerprint Recognition.

3. Biometric Systems: Technology, Design and Performance Evaluation, Editors: J. Wayman, A. Jain, D. Maltoni and D. Maio, Springer, 2005

COE-574

Information Security Risk Management

Objective:

To understand and development of concepts required for risk-based planning and risk management of computer and information systems.

Learning Outcomes:

After completion of this course, students will be able to learn:

- The cognitive skills and ability to identify, analyze and articulate the importance of managing IS-related risk and security issues in organizations, and the relationship between these and the achievement of business value from IS/IT investments
- The cognitive skills and ability to identify, analyze, synthesize and evaluate the costs of not appropriately identifying and managing risk and security concerns in projects and organizations, resulting in IS/IT failures, dysfunctional systems, and systems which fail to deliver value to key stakeholders
- The cognitive skills and practical ability to develop and document IS/IT risk and security management plans that detail contingency planning strategies and practices
- The cognitive skills and ability to identify, analyze, synthesize and articulate the major theories and concepts associated with IS failure and the management of IS risk, including factors argued to lead to unsatisfactory outcomes with respect to IS/IT and Information Security

Syllabus:

An Introduction to Risk Management: Introduction to the Theories of Risk Management; The Changing Environment; The Art of Managing Risks.

The Threat Assessment Process: Threat Assessment and its Input to Risk Assessment; Threat Assessment Method; Example Threat Assessment;

Vulnerability Issues: Operating System Vulnerabilities; Application Vulnerabilities; Public Domain or Commercial Off-the-Shelf Software; Connectivity and Dependence; Vulnerability assessment for natural disaster, technological hazards, and terrorist threats; implications for emergency response, vulnerability of critical infrastructures;

The Risk Process: What is Risk Assessment? Risk Analysis; Who is Responsible?

Tools and Types of Risk Assessment: Qualitative and Quantitative risk Assessment; Policies, Procedures, Plans, and Processes of Risk Management; Tools and Techniques; Integrated Risk Management; Future Directions: The Future of the Risk Management.

Text books:

1. Malcolm Harkins, Managing Risk and Information Security, Apress, 2012.
2. Daniel Minoli, Information Technology Risk Management in Enterprise Environments, Wiley, 2009.

Reference books:

1. Andy Jones, Debi Ashenden ,Risk Management for Computer Security: Protecting Your Network & Information Assets, , 1st Edition, Butterworth-heinemann, Elsevier, 2005.
2. Andreas Von Grebmer, Information and IT Risk Management in a Nutshell: A pragmatic approach to Information Security, 2008, Books On Demand Gmbh.

COE-576

Proactive Security Tools and Techniques

Objective: The objective of this course is the use and application of security tools and techniques on real life scenarios such as cyber security consultancy and forensics. In addition to this, students will be able to improve their technical skill-sets and enhance their learning experiences through the use of various cyber tools.

Learning Outcomes:

After completion of this course, students will be able to:

- Understand how important security principles must be adhered to when securing the infrastructures
- Understand the importance of balancing security, operational effectiveness and cost
- Analyze and to aptly secure the cyber perimeter of the infrastructures against cyber attacks

Syllabus:

Network Security tool taxonomy: Reconnaissance tools, attack and penetration tools, defensive tools.

High, Medium, Low and Virtual honeypots, NMAP, TCPDUMP, Wireshark, Reverse firewalling, securing honeypots, sebek, Argos, Honeywall.

Hybrid systems, client honeypots, Botnets, tracking botnets, analysing malware.

Capturing malware using honeypots, implementing honeypots, medium interaction and high interaction honeypots.

Security metrics: What is a security metric? Metric and measurement, Designing effective security metrics, Data sources for security metrics, Analysis of security metrics data, Designing the security measurement project, Measuring security cost and value, Different context for security process management.

Text books:

1. Gary M. Jackson, Predicting Malicious Behavior, John Wiley & Sons, 2012.
2. Niels Provos, Thorsten Holz, Virtual Honeypots: From Botnet Tracking to Intrusion Detection, Addison Wesley, 2007.
3. IT Security Metrics, Lance Hayden, Tata McGraw Hill.

Reference books:

1. Lance Spitzner, Know Your Enemy: Learning about Security Threats (2nd Edition), 2004.
2. Building Open Source Network Security Tools: Components and Techniques, Mike Schiffman.

COE-578

Social Network Analysis

Objectives:

To learn about structure and evolution of networks, to build a framework of network analysis that covers measures such as density, centrality, clustering, centralization, and spatialization.

Learning Outcomes:

On completion of this course, students will be able to:

- Understand various concepts in networks like nodes, edges, various topologies, node degrees
- Understand dynamics and evolution of social networks
- Understand the development of social structures
- Understand the framework of network analysis
- Compare and study various random network models
- Understand the concept of network centrality with various concepts like betweenness, closeness, page ranks etc.
- Know about various community concepts like: clustering, community structure, modularity

- Understand how various social media networks are working and using SNA in their infrastructure

Syllabus:

Networks- Concepts: nodes, edges, adjacency matrix, one and two-mode networks, node degree

Random network models: Erdos-Renyi and Barabasi-Albert- Concepts: connected components, giant component, average shortest path, diameter, breadth-first search, preferential attachment

Network centrality- Concepts: Betweenness, closeness, eigenvector centrality (+ PageRank), network centralization

Community- Concepts: clustering, community structure, modularity, overlapping communities

Small world network models, optimization, strategic network formation and search- Concepts: small worlds, geographic networks, decentralized search

Contagion, opinion formation, coordination and cooperation- Concepts: simple contagion, threshold models, opinion formation, unusual applications of SNA

SNA and online social networks- Concepts: how services such as Facebook, LinkedIn, Twitter, Couch Surfing, etc. are using SNA to understand their users and improve their functionality

Text books and References:

1. John Scott, Social Network Analysis, 3rd Edition, SAGE, 2012.
2. Wouter de Nooy, Andrej Mrvar, Vladimir Batagelj, Exploratory Social Network Analysis with Pajek, 2nd Revised Edition, Cambridge University Press, 2011.
3. Patrick Doreian, Frans Stokman, Evolution of Social Networks, Routledge, 2013.
4. David Easley and Jon Kleinberg, Networks, Crowds, and Markets: Reasoning About a Highly Connected World, Cambridge University Press, 2010.

COE-580

Enterprise Security & Management

Course Objectives

The main objective of this course is to study and understand the essentiality of the security in organizations that deal with data and are connected to the Internet. This course will help to understand risks involvement in managing and storing information assets in organizations.

Learning Outcomes

Upon successful completion of this course, students should be able to:

- Understand basics of enterprise security

- Understand need of enterprise security
- Study various possible cyber attacks and its adverse effects on organization
- Understand various risks in enterprise security

Syllabus

Introduction to Enterprise Security, Identifying information assets and organization risk exposure, Discovering security holes in organization, Defining corporate risks and risk management issues, Business risks related to privacy and regulatory considerations, Conceptual review of detection, assessment, hardening techniques, Possible attacks on enterprises, Active Defense Mechanisms, Corporate Security Policies, Conducting Vulnerability Analysis, Security Automation Technologies, Security Content Automation Protocol (SCAP) technologies and standards

Text books and References:

1. Jake Kouns, Daniel Minoli, Information Technology Risk Management in Enterprise Environments: A Review of Industry Practices and a Practical Guide to Risk Management Teams, John Wiley & Sons, 2011
2. Dave Tyson, Security Convergence: Managing Enterprise Security Risk, Butterworth-Heinemann, 2011
3. Malcolm Harkins, Managing Risk and Information Security: Protect to Enable, Apress, 2012
4. Greg Witte, Melanie Cook, Matt Kerr, Shane Shaffer, Security Automation Essentials: Streamlined Enterprise Security Management & Monitoring with SCAP, McGraw Hill Professional, 2012

COE-582

SCADA & DCS Security

Objective:

The subject aims to start with the study of basic concepts of SCADA communication systems and related protocols alongwith vulnerability detection and testing.

Learning Outcomes:

On completion of this course, students will have proper understanding of:

- Fundamentals of SCADA protocols.
- Basic working knowledge of SCADA & DCS.
- SCADA & DCS Security Management Implementation and Guidelines.
- Risk Assessment and Cyber Security concerns.

Syllabus:

Scada Basics- Scada and ICS Architecture, PLC and HMI Basics, RTOS - real time operating systems

Scada Related Protocols- Modbus RTU, Modbus TCP/IP, DNP3, DNP3 TCP/IP, OPC DA/HAD, SCADA protocol fuzzing

Finding Vulnerabilities in HMI software- Buffer Overflows, Shellcode

Previous attacks Analysis- Stuxnet, Duqu.

Hardware Testing- Jtag, GNU/Radio for Exploiting Radio Frequencies, SCADA RTOS firmware reversing

Text books and References:

1. T. Macaulay and B. L. Singer, Cyber security for Industrial Control Systems: SCADA, DCS, PLC, HMI, and SIS, Auerbach Publications, 2011.
2. J. Lopez, R. Setola, and S. Wolthusen, Critical Infrastructure Protection Information Infrastructure Models, Analysis, and Defense, Springer-Verlag Berlin Heidelberg, 2012.
3. Robert Radvanovsky and Jacob Brodsky, editors. Handbook of SCADA/Control Systems Security. CRC Press, 2013.
4. A.W. Colombo, T. Bangemann, S. Karnouskos, S. Delsing, P. Stluka, R. Harrison, *et al.* Industrial cloud-based cyber-physical systems Springer International Publishing, 2014.
5. D. Bailey, Practical SCADA for Industry. Burlington, MA: Newnes, 2003.

COE-584

Ethics and Law of Cyber Security

Objective:
To understand the basics of cyber law, its related issues and ethical laws of computer for different countries.

Learning Outcomes:

The students of this course will be able to:

- Understand key terms and concepts in cyber law, intellectual property and cyber crimes, trademarks and domain theft.
- Determine computer technologies, digital evidence collection, and evidentiary reporting in forensic acquisition.

- Secure both clean and corrupted systems, protecting personal data, securing simple computer networks, and safe Internet usage.
- Incorporate approaches for incident analysis and response.

Syllabus:

Introduction-Cyber Security and its problem-Intervention Strategies: Redundancy, Diversity and Autarchy.

Introduction to the Legal Perspectives of Cybercrimes and Cyber security, Cybercrime and the Legal Landscape around the World, Why Do We Need Cyber laws, The Indian IT Act, Challenges to Indian Law and Cybercrime Scenario in India, Consequences of Not Addressing the Weakness in Information Technology Act, Digital Signatures and the Indian IT Act, Cybercrime and Punishment, Cyber law, Technology and Students: Indian Scenario.

Private ordering solutions, Regulation and Jurisdiction for global Cyber security, Copy Right-source of risks, Pirates, Internet Infringement, Fair Use, postings, criminal liability, First Amendments, Data Losing.

Ethics, Legal Developments, Cyber security in Society, Security in cyber laws case studies, General lawand Cyber Law-a Swift Analysis.

Text books:

1. Sunit Belapure and Nina Godbole, Cyber Security: Understanding Cyber Crimes, Computer Forensics And Legal Perspectives, Wiley India Pvt. Ltd, 2011.

Reference books:

1. Mark F Grady, Fransesco Parisi, "The Law and Economics of Cyber Security", Cambridge University Press, 2006
2. Jonathan Rosenoer, "Cyber Law: The law of the Internet", Springer-Verlag, 1997.

COE-586
Fuzzing and Software Crash Analysis

Objective:

The objective of this course is to learn and understand basics concepts of fuzzing & methods of fuzzing. This course also provides knowledge of different fuzzing techniques and advance fuzzing concepts. By taking this course students will be able to understand and find the software security vulnerabilities.

Learning Outcomes:

After attending this course students will be able to:

- Discover zero-day vulnerabilities in programs running on fully-patched modern operating systems.
- Create exploits to take advantage of vulnerabilities through a detailed penetration testing process.
- Use the advanced features of IDA Pro and write your own IDC and IDA Python scripts.
- Perform remote debugging of Linux and Windows applications.
- Understand and exploit Linux heap overflows.
- Write Return-Oriented Shellcode.
- Perform patch diffing against programs, libraries, and drivers to find patched vulnerabilities.
- Perform Windows heap overflows and use-after-free attacks.
- Use precision heap sprays to improve exploitability.
- Perform Windows Kernel debugging up through Windows 8 64-bit.
- Jump into Windows kernel exploitation.

Syllabus:

Windows Exploit Development- Stack based Overflows, SEH based exploits, Unicode based Exploits, Bypassing Stack Cookies, SafeSeh, SEHOP, HW DEP and ASLR, Egg HuntersWriting W32 shellcode, Shellcode Injection (PE infection), Return Oriented Programming, Spraying the Heap, Introduction to Kernel Exploitation, Remote Kernel Exploitation on Windows 7 using ROP, Introduction to exploits on 64-bit systems, Advanced Heap Spray techniques with Flash and HTML5, Leaked memory pointers and Dynamic ROP chains.

Windows Kernel Exploitation- Basics of Kernel Debugging with Windbg, Microsoft Kernel Vulnerabilities Overview, Null/Various Pointer Dereference Exploitation, Arbitrary Memory Overwrite Exploitation, Stack-Based Buffer Overflow Exploitation, Race Condition Exploitation, Recent Exploit Mitigation Technologies Overview, Pool Overflow/Corruption Exploitation, Hardcore Pool Overflow/Corruption Exploitation, Advanced Memory Corruption Techniques.

Linux Exploit Development- Introduction to Linux Exploit Development, Linux Format String Exploitation, Stack overflow in Linux, Stack Overflow ASLR bypass Using ret2reg, ASCII-Armor and ret2libc, Linux Shellcode development.

Text books and References:

1. Ari Takanen et al, "Fuzzing for Software Security Testing and Quality Assurance," Artech House, 2008.
2. Michael Sutton et al, "Fuzzing: Brute Force Vulnerability Discovery," Addison-wesley, 2007.

COE-588

Advanced Operating System Design and Security

Objective:

The aim of this course is to study, learn, and understand the main concepts of secure advanced operating systems design and Hardware and software features that support these systems.

Learning Outcomes:

After completion of this course, the students will be able to:

- Identify and define key terms related to operating systems
- Learn, and understand the main concepts of advanced operating systems design
- Learn OS issues related to the Internet, intranets, pervasive computing, embedded systems, mobile systems and wireless networks.
- Learn to design a secure operating systems

Syllabus:

Introduction, Access Control Fundamentals, Multics, Security in Ordinary Operating Systems, Verifiable Security Goals, Security Kernels, Securing Commercial Operating Systems, Solaris Trusted Extensions, Building a Secure Operating System for Linux, Secure Capability Systems, Secure Virtual Machine Systems, System Assurance,.

Fault tolerance issues. OS issues related to the Internet, intranets, pervasive computing, embedded systems, mobile systems and wireless networks. Case studies of contemporary operating systems.

Comparative study of OS; UNIX, Multics, Unix File System + Measurements, The Log-Structured File System, Server less Network File Systems, The Coda File System, AFS, Virtual Memory, User-Level Virtual Memory, Software Fault Isolation. Issues of Security in OS, Cryptographic file systems.

Text books and References:

1. Mukesh Singhal and Niranjan Shivaratri, Advanced Concepts in Operating Systems, McGraw-Hill, 2011.
2. Trent Jaeger, Operating System Security, Morgan & Claypool Publishers, 2008.

101

COE-590

BIOS and SMM Security

Objectives:

To understand BIOS boot environments and how they interact with the platform architecture. To understand How System Management Mode (SMM) is instantiated and must be protected.

Learning Outcomes:

On completion of the course, students will be able to:

- Understand introductory concepts of BIOS UEFI/EFI boot process, System Management Mode (SMM), chipset architecture
- Understand how CPU caching can actually undermine SMM security
- Learn to fish so student can take their newly-acquired knowledge to further security research in this area
- Understand how the BIOS flash chip should be locked down
- Understand how the BIOS interacts with the Trusted Platform Module (TPM) and the measured boot process
- Understand details of System Management Interrupt (SMI) handlers
- Study various detection methods

Syllabus:

Introduction- Introduction to BIOS concepts UFFI/EFI Boot Process, Chipset architecture, Input/output (including PCI) and how the BIOS uses it to configure the system, PCI Option ROMs, BIOS' interaction with the TPM and the Measured Boot process, BIOS' lockdown of the serial flash where the BIOS itself resides, System Management Mode (SMM), CPU caching, Introduction to UEFI BIOS, The UEFI phases and security parameters specific to UEFI, Reverse engineering UEFI modules, Useful tools and methods for analyzing potentially malicious UEFI drivers

Reverse engineering System Management Interrupt (SMI) handlers: Brief Overview of BIOS Firmware, Overview of System Management Mode (SMM), Extracting binary of BIOS SMI Handlers, Hooking SMI handlers.

Text books and References:

1. Bryan Parno, Jonathan M. McCune, Adrian Perrig, Bootstrapping Trust in Modern Computers, Springer Science & Business Media, 2011.
2. Dave Shackleford, Virtualization Security: Protecting Virtualized Environments, John Wiley & Sons, 2012.

3. BRAGG, Network Security: The Complete Reference, McGraw Hill Professional, 2012.
4. Vincent Zimmer, Michael Rothman, Suresh Marisetty, Beyond BIOS: Developing with the Unified Extensible Firmware Interface, Intel Press, 2010.

COE-592

Disaster Recovery

Objectives:

The objective of this course is to provide students with:

- Understanding of the roles of the various phases of disaster management and issues concerning planning and policies in those phases.
- Understanding of comprehensive emergency management from a planning and policy Perspective.
- Understanding of the role of federal, state, and local governments in disaster planning and policies.
- Knowledge of mitigation planning and policy strategies.
- Understanding of comprehensive emergency management and related plans
- Understanding of factors affecting short and long-term recovery and rebuilding and the role of planners and policy-makers.
- Understanding of the factors that give rise to disaster vulnerabilities (e.g. natural, physical, social, economic, policies, and governance).
- Understanding of the factors that give rise to differential vulnerabilities and levels of community resilience
- Knowledge and capabilities to assess and manage these vulnerabilities through disaster planning and policy-making.
- Data, methods, tools, and geospatial techniques (including GIS) that can enhance vulnerability assessments and knowledge building.
- Competencies to utilize mapping in mitigation planning and response operations

Learning Outcomes:

After completing this course, you will be able to:

- Affirm the usefulness of integrating management principles in disaster mitigation work
- Distinguish between the different approaches needed to manage pre- during and post-disaster periods
- Explain the process of risk management
- Relate to risk transfer

Syllabus

Introduction: Hazards and Disasters: Planning and Policies, Disaster Mitigation Policies and Planning, Mitigation Planning and Policy Strategies: Local, State, and Federal Level, Measuring

and Mapping Vulnerability, Social, Economic, and Political Vulnerabilities, Community Resilience, Emergency Management Planning, Communication and Risk Management (Policies and Plans), Disaster Response: Planning for Response, Supporting Emergency Response Operations using Geospatial Technologies, Collaboration and Coordination in Emergency Response Planning & Management, Disaster Recovery and Rebuilding, Long-term recovery, Post-Disaster Recovery Planning and Reconstruction, Post-Disaster Housing Planning.

Text books and References:

1. Waugh, William L. Jr. (2000). Living with Hazards, Dealing with Disasters: An Introduction to Emergency Management. Armonk, New York: M.E. Sharpe.
2. Burby, Raymond (1998). Cooperating with Nature: Confronting natural hazards with land-use planning for sustainable communities. Joseph Henry Press.
3. Birkland, Thomas. 2006. Lessons of Disaster: Policy Change after Catastrophic Events. Washington,D.C.: Georgetown University Press.
4. Drabek, Thomas. 2010. The Human Side of Disaster. Taylor and Francis

COE-536

Research Methodology

Objectives: Objective of this course is to make students able to:

- Understand research terminology
- To gain insights into how scientific research is conducted.
- To help in critical review of literature and assessing the research trends, quality and extension potential of research and equip students to undertake research.
- To critically analyze published research
- To learn and understand various research methods.
- To identify the influencing factor or determinants of research parameters.
- To test the significance, validity and reliability of the research results.
- To help in documentation of research results.
- To learn legal or ethical issues for an investigation.

Learning Outcomes:

At the end of this course, the student should be able to:

- Learn how scientific research is conducted
- Identify and justify an appropriate research methodology for an investigation.
- Conduct a literature review and use this to construct a research question suitable for conducting research at Masters level.

- Prepare a research proposal which includes justification of the chosen topic and an indication of the methods to be used.
- Able to learn legal and professional ethics.

Syllabus:

Introduction: Meaning and significance of research and scholarship; difference between undergraduate and research education; skills, habits and attitudes for research; status of research in India; course objectives.

Thinking skills: Problem solving, creativity, problem finding and formulation, Levels and styles of thinking; common-sense and scientific thinking; examples.Problem solving strategies – reformulation or rephrasing, techniques of representation, logical thinking, division into sub-problems, verbalization, awareness of scale; Importance of graphical representation; examples. Creativity – some definitions, illustrations from day to day life; intelligence versus creativity; gift or skill; creative process; requirements for creativity – role of motivation and open vs closed minds; multiple approaches to a problem, analytical vs analogical reasoning, puzzle solving; examples; prepared mind; Creative problem solving using Triz. Problem finding and literature survey, Information gathering – reading, searching and documentation; types, attributes and sources of research problems; problem formulation. Prescriptions for developing creativity and problem solving.

Experimental and modeling skills: Scientific method; role of hypothesis in experiment; units and dimensions; dependent a n d independent variables; control in experiment; precision and accuracy; need for precision; definition, detection, estimation and reduction of random errors; statistical treatment of data; definition, detection and elimination of systematic errors; design of experiments; experimental logic; documentation; Types of models; stages in modeling; types of models; curve fitting; the art of making approximations; problem representation; logical reasoning; mathematical skills; finite element and Monte Carlo techniques of numerical simulation; Two case studies illustrating experimental and modeling skills.

Effective communication - oral and written: Examples illustrating the importance of effective communication; stages and dimensions of a communication process.Oral communication –verbal and non-verbal, casual, formal and informal communication; interactive communication; listening; form, content and delivery; various contexts for speaking- conference, seminar etc; visual aids Written communication - form, content and language; layout, typography and illustrations; contexts for writing – paper, thesis, reports etc.Prescriptions for developing communication skills.

Publishing and patenting: Difference between publishing and patenting; relative importance of various forms of publication; choice of journal and reviewing process; stages in the realization of a paper or a patent and how to handle these

Stress and time management, Interpersonal skill, professional ethics: Psychological phases of a PhD process; stress points; aims of supervisors; mismatches between scholar and supervisor

and related problems. Managing self; empathy; managing relationships with your supervisor, colleagues, and supporting staff; listening; assertiveness; teamwork; sense of humor.Duration and stages of a PhD process; long term and short term goals; time tabling and deadlines. Profession; integrity, objectivity, fairness and consistency; loyalty; plagiarism and research ethics; safety

Text books:

1. E. M. Phillips and D. S. Pugh, "How to get a PhD - a handbook for PhD students and their supervisors", Viva books Pvt Ltd, 2010.

Reference books:

1. Handbook of Science Communication, compiled by Antony Wilson, Jane Gregory, Steve Miller, Shirley Earl, Overseas Press India Pvt Ltd, New Delhi, 1st edition, 2005.
2. G. L. Squires, "Practical physics", Cambridge University Press.

Related Links:

1. http://www.cs.virginia.edu/~robins/YouAndYourResearch.html Richard hamming, "You and your research",
2. http://www.apastyle.org/authorship.html"Reflections on Determining Authorship Credit and Authorship Order on faculty–student Collaborations"
3. http://abcnews.go.com/Technology/story?id=1831398"Where do good ideas come from?"

COE-538

Mobile Computing

Objective:

To understand modern trend of mobile computing and to acquire knowledge about the methodology followed in developing secure computing applications for cellular, MANET, and sensor environment.

Learning Outcomes:

At the end of this course, students will be able to learn recent development of mobile computing and to acquire knowledge about the methodology followed in developing secure computing applications for cellular, MANET, and sensor environment.

Syllabus:

Challenges in mobile computing, cellular Vs ad hoc mobile computing environments, coping with uncertainties, resource scarcity, bandwidth, and mobility, Routing in MANETs, TORA,

TORA-based computing protocols, Fundamental problems, Synchronization, Mutual exclusion, Coordinator election, Agreement problems, Termination in cellular systems and MANETs, Handling fundamental challenges in faulty distributed environments, Causal message delivery, Publish/Subscribe, Concepts of graph theory applicable to MANETs, Minimum spanning tree, Ring, Tree, Hybrid architectures, Fault tolerance, Coordinated and Uncoordinated Check pointing, No blocking protocols.

Text books:

1.Prashant Kumar Pattnaik, Rajib Mall, Fundamental of mobile computing, PHI Learning Pvt. Ltd, 2012.

2.Mohd. Ilyas & Imad Mahgoub, Mobile Computing Handbook, CRC Press/Aurbach Publications, Boca Raton USA, 2005.

Reference books:

1.Theodore S. Rappaport, Wireless Communications: Principles and Practice, Second Edition, Prentice Hall, 2002.

2. Ivan Stojmenovic, Handbook of Wireless Networks and Mobile Computing, John Wiley & Sons, 2002.

COE-594

Ethical hacking

Objective:

Aim of this course is to teach students how to think like a hacker, providing them with a deep understanding of security issues and concerns. In addition, this course also provides the students with specialist knowledge and experience of advanced hacking techniques and their countermeasures.

Learning Outcomes:

Upon completion of this course, the students will be able to:

- Critically evaluate the potential countermeasures to advanced hacking techniques.
- Analyze and critically evaluate techniques used to break into an insecure web application and identify relevant countermeasures.
- Demonstrate a critical evaluation of an advanced security topic with an independent project.

Syllabus:

Introduction: Understanding the importance of security, Concept of ethical hacking and essential Terminologies-Threat, Attack, Vulnerabilities, Target of Evaluation, Exploit. Phases involved in hacking, Foot printing, Scanning, System Hacking, Session Hijacking.

Buffer Overflows: Significance of Buffer Overflow Vulnerability, Why Programs/Applications are vulnerable. Reasons for Buffer Overflow Attacks. Methods of ensuring that buffer overflows are trapped.

Sniffers: Active and passive sniffing. ARP poisoning and countermeasures. Man in the middle attacks, Spoofing and Sniffing attacks. Sniffing countermeasures.

SQL Injection: Attacking SQL Servers, Sniffing, Brute Forcing and finding Application Configuration Files, Input validation attacks. Preventive Measures. Web Application Threats, Web Application Hacking, Cross Site Scripting / XSS Flaws / Countermeasures Correct Web Application Set-up.

Web Application Security: Core Defence Mechanisms. Handling User Access, Authentication, Session Management, Access Control.

Web Application Technologies: HTTP Protocol, Requests, Responses and Methods. Encoding schemes.Server side functionality technologies (Java, ASP, PHP).

Attacking Authentication: Attacking Session Management, Design Flaws in Authentication Mechanisms Attacking Forgotten Password Functionality, attacking Password change functions. Countermeasures to authentication attacks

Attacking other users: Reflected XSS Vulnerabilities, Stored XSS Vulnerabilities, DOM-Based XSS Vulnerabilities, HTTP Header Injection. Countermeasures to XSS.

Text books:

1. Patrick Engebretson, The Basics of Hacking and Penetration Testing, Elsevier, 2013.
2. Network Security and Ethical Hacking, Rajat Khare, Luniver Press, 2006.

Reference books:

1. Network intrusion alert: an ethical hacking guide to intrusion detection, Ankit Fadia, Manu Zacharia, Thomson Course Technology PTR, 2007.
2. Ethical Hacking, Thomas Mathew, OSB Publisher, 2003.
3. Hacking Exposed: Network Security Secrets & Solutions, Stuart McClure, Joel Scambray and George Kurtz, McGraw-Hill, 2005.

COE-596

Digital Forensics & Incident Response

Objective:

Aim of this course is to teach deep understanding of security issues and digital forensics & incident response. In addition, this course also provides the students with specialist knowledge and experience of various digital forensics techniques and incident response.

Learning Outcomes:

Upon completion of this course, the students will be able to:

- Understanding of various digital forensics techniques and its usage for the potential countermeasures or incident response.
- Demonstrate a critical evaluation and use of digital forensics technique to do incident response with an independent project.

Syllabus:

Forensics Overview: Computer Forensics Fundamentals, Benefits of Computer Forensics, Computer Crimes, Computer Forensics Evidence and the Courts, Legal Concerns and Privacy Issues

Forensics Process: Forensics Investigation Process, Securing the Evidence and Crime Scene, Chain of Custody, Law Enforcement Methodologies, Forensics Evidence, Evidence Sources. Evidence Duplication, Preservation, Handling, and Security, Forensics Soundness, Order of Volatility of Evidence, Collection of Evidence on a Live System, Court Admissibility of Volatile Evidence

Acquisition and Duplication: Sterilizing Evidence Media, Acquiring Forensics Images, Acquiring Live Volatile Data, Data Analysis, Metadata Extraction, File System Analysis, Performing Searches, Recovering Deleted, Encrypted, and Hidden files, Internet Forensics, Reconstructing Past Internet Activities and Events, E-mail Analysis, Messenger Analysis: AOL, Yahoo, MSN, and Chats

Mobile Device Forensics: Evidence in Cell Phone, PDA, Blackberry, iPhone, iPod, and MP3. Evidence in CD, DVD, Tape Drive, USB, Flash Memory, Digital Camera, Court Testimony, Testifying in Court, Expert Witness Testimony, Evidence Admissibility

Text books:

1. Jason Luttgens, Matthew Pepe, Kevin Mandia, Incident Response & Computer Forensics, McGraw-Hill Osborne Media, 3rd edition , 2014.
2. Keith J. Jones, Richard Bejtlich, Curtis W. Rose, Real Digital Forensics: Computer Security and Incident Response, Paperback – Import, 2005.

Reference books:

1. John Sammons, The Basics of Digital Forensics: The Primer for Getting Started in Digital Forensics Paperback, February 24, 2012.
2. Hacking Exposed: Network Security Secrets & Solutions, Stuart McClure, Joel Scambray and George Kurtz, McGraw-Hill, 2005.

COE-598

Data Mining and Analysis

Objectives: The objective of this course is:

- To introduce students to the basic concepts and techniques of Data Mining.
- To develop skills of using recent data mining software for solving practical problems.
- To gain experience of doing independent study and research.
- To demonstrate their ability to implement typical data mining techniques.
- To accurately evaluate the performance of algorithms, as well as formulate and test hypotheses.
- To implement and apply basic algorithms for supervised and unsupervised learning.

Learning Outcomes:

On completion of this course you should have gained a good understanding of the basic concepts, principles and techniques of data mining. Specifically, you should be able to:

- Define knowledge discovery and data mining.
- Recognize the key areas and issues in data mining.
- Apply the techniques of clustering, classification, association finding, feature selection and visualization to real world data.
- Determine whether a real world problem has a data mining solution.
- Apply evaluation metrics to select data mining techniques.

Syllabus:

Introduction to pattern recognition, Bayes Decision Theory, Linear Classifiers: Least square methods, Support Vector Machines, Non Linear Classifiers: Back Propagation Algorithm, Radial Basis Function Networks, Decision Trees, Random Forest, Combining Classifiers Algorithm, Association Rules Mining: Apriori algorithm, Partition algorithm, Dynamic inset counting algorithm, FP – tree growth algorithm, Generalized association rule, Temporal Data mining: Basic concepts of temporal data Mining, The GSP algorithm, Feature Generation, Feature Selection, Template Matching Techniques, Clustering Algorithms: Sequential Algorithms, Hierarchical clustering algorithms, Clustering algorithms based of cost function optimization, Clustering algorithms based on Graph Theory, Clustering algorithms based on competitive learning, Data Mining for Intrusion detection, Futuristic Technologies for Cyber Security

Text books and References:

1. Jiawei Han and Micheline Kamber, Data Mining: Concepts and Techniques, Morgan Kaufman Publishers, Third Edition, 2011.
2. F. Provost and T. Fawcett: Data Science for Business. O'Reilly Media, 2013.
3. Bing Liu: Web data Mining - Exploring Hyperlinks, Contents and Usage Data, Second Edition, Springer, 2011.
4. Pang-Ning Tan, Michael Steinbach, Vipin Kumar: Introduction to Data Mining, Pearson/Addison Wesley.
5. David Hand, Heikki Mannila, Padhraic Smyth: Principles of Data Mining, the MIT Press.

COE-600

Special Topics in Security-II

Objectives:

The students of this course will be able to:

- Incorporate approaches to secure networks, firewalls, intrusion detection systems, and intrusion prevention systems.
- Examine secure software construction practices.
- Understand principles of web security.
- Incorporate approaches for incident analysis and response.
- Incorporate approaches for risk management and best practices.

Learning Outcomes:

Upon completion of this course, students will be able to:

- Identify infrastructure components and the roles they serve, and design infrastructure including devices, topologies, protocols, systems software, management and security. Analyze performance of enterprise network systems.
- Effectively communicate technical information verbally, in writing, and in presentations.
- Use appropriate resources to stay abreast of the latest industry tools and techniques analyzing the impact on existing systems and applying to future situations.
- Explain the concepts of confidentiality, availability and integrity in Information Assurance, including physical, software, devices, policies and people. Analyze these factors in an existing system and design implementations.
- Cite and comply with relevant industry and organizational codes of conduct and ethics.

Syllabus:

Injection Vulnerabilities: Structured Query Language (SQL), Cross-Site Scripting (XSS).

Botnets: Measurement and Disinfection, Botnet Communication Topologies, Intelligence Resources, Sandboxed Tools.

Quantum Cryptography: Quantum Logic Gates, Quantum Algorithms, Physical Realization of Cubits, Single Photons, EPR Pairs.

Cyber Incident Analysis and Response Incident Preparation, Incident Detection and Analysis. Containment. Eradication, and Recovery

Network Forensic Investigation Forensic Technologies, Digital Evidence Collection. Evidentiary Reporting .

GPS and Geo-Tagging, Forced Disclosure of Encryption Keys, Quantum Cryptography, Visual Cryptography, Biometrics in Cyber Physical Systems, Information hiding in iOS, Hyper-visor based Malware protection

References:

1. Seth Fogie, Jeremiah Grossman, Robert Hansen, XSS Attacks: Cross Site Scripting Exploits and Defense, Syngress, 2007
2. N. Namekata, S. Mori, and S. Inoue, "Quantum key distribution over an installed multimode optical fiber local area network", Optical Express, 2005.
3. T.M.T. Nguyen. M. A. Sfaxi, and S. Ghernaouti-Hélie, "Integration of Quantum Cryptography in 802.11 Networks", Proceedings of the FirstInternationalConference on Availability, Reliability and Security (ARES), pp. 116-123, Vienna, April 2006.
4. Nagaraj V. Dharwadkar , B.B. Ambedker, S R. Joshi, "Visual Cryptography for Color Image using Color Error Diffusion", ICGSTGVIPJournal ,volume 10, issue 1,February 2010.

Item 26.10 To approve revision in weightage of continuous evaluation components w.e.f academic session 2015-16.

As per the present regulations, the weightage of attendance of a student in the class for computing the marks under the sub-components of continuous evaluation is 40% in the theory as well as laboratory courses.

The weightage is not only comparable to that of the two mid-semester examinations but is also higher than the teacher's assessment. The weightage for the various sub-components of continuous evaluation as presented in the table below was approved by the SCSA in its 25th meeting held on 19.08.2009 vide agenda item no. 1.

However it has been felt that though there must be some incentive for being present in the class, yet the present regulation of 40% of the continuous evaluation sub-component is on the higher side

In view of above it is proposed to modify the continuous evaluation component as follows:-

CONTINUOUS EVALUATION SUB-COMPONENTS AND WEIGHTAGE

	SUB-COMPONENT	Weightage Existing	Proposed
(a)	**Theory Papers**		
1.	Two Mid Semester Exams.	10+10=20	15+15=30
2.	Teacher's Assessment through viva-voce, Home Assignments, on the Spot tests, Short Quizzes etc	10	10
3.	Class Attendance (L+T)*	20	10
4.	End Semester Examination	50	50
(b)	**For Practicals**		
1.	Mid Semester Evaluation (to be conducted in regular Practical Classes)	20	30
2.	Teacher's Assessment through viva-voce, short quizzes, reports, Class work etc.	20	20
3.	Class Attendance*	20	10
4.	End Semester Examination	40	40
(c)	For Seminars, Projects, Training, Comprehensive viva and General Fitness evaluation, the weightage will be decided by Departmental Review/Academic Committees		

*The maximum attendance for calculation of attendance component of sessional marks shall be 90% of the total classes held

The meeting minutes of the 25th Meeting of SCSA is enclosed as Annexure-26.10 from Page 114 to 115

The Senate may kindly consider and approve the revision in continuous evaluation components from academic session 2015-16.

ANNEXURE-26.10

NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA-136119

No. Acad/ 2009/257/ SCSA/ Dated: 21.8.2009

Minutes of the 25th SCSA meeting held on 19th August, 2009 at 4.30 PM in the Office of the Director of the Institute

The following were present:-

1	Dr. M N Bandyopadhyay, Director	In Chair
2	Prof. R.K. Bansal, Dean (Academic)	
3	Dr. T K Garg, Professor MED	
4	Dr. S.P Jain, Dean (Students Welfare & TP)	
5	Dr. V.K. Arora, Professor CED	
6	Dr. S.K Sharma, Dean (Estate, Const. & Elect. Mtc.)	
7	Dr. K,S Kasana Chairman MED	
8	Dr. K.B Singh, Chairman, Hum & Social Scs. Deptt	
9	Dr. Kuldeep Kumar, Chairman, Mathematics Deptt.	
8	Dr. K.S. Sandhu, Chairman FED	
9	Dr. Baldev Setia Chairman, CFD	
10	Dr. Rajender Kumar, COE	
11	Dr. S.K. Mahna, Chairman Physics Deptt	
12	Dr. R.S Bhatia, Chairman, Computer Applications Deptt	
13.	Dr. R.K Sharma, Chairman, FCE Deptt	
14.	Dr. D.P Singh, Chairman, Chemistry Department	
15	Dr Ashwani Jain, Professor,I/C Acad.Affairs	
17	Dr. A.K Singh, Chairman, Computer Engg. Deptt	
18.	Sh.. RPS Lohchab, Registrar &Secretary SCSA	

The following decisions were taken.

Item No.1: To consider the weightage of attendance in the sessionals of various subjects

The problem of mass absenteeism of the students has become quite serious. The matter was discussed at length in the SCSA meeting and it was decided that attendance be given some weightage in the sessional component of various theory and laboratory courses, with no minimum attendance requirement to appear in the end semester examinations. The following table with break-up of various sub-components and their respective weightages was approved to be adopted for continuous evaluation of students with effect from the even semester of session 2009-2010.

	SUB-COMPONENT	WEIGHTAGE %
(a)	Theory Papers	
1	Three Class Tests (Two best to be reckoned)	[illegible]
2	Teachers Assessment through viva voce, Home Assignments, on the Spot tests, Short Quizzes etc	10
3	Class Attendance (L+T)*	10
4	End Semester Examination	60
(b)	For Practicals	
1	Mid Semester Evaluation (to be conducted in regular Practical Classes)	20
2	Teacher's Assessment through viva voce, short quizzes, reports, Class work etc.	20
3	Class Attendance*	20
4	End Semester Examination	40
(c)	For Seminars, Projects, Training, Comprehensive viva and General Fitness evaluation, the weightage will be decided by Departmental Review/Academic Committees	

*Attendance weightage component is to be calculated by multiplying the weightage by the fraction of classes attended by student

This decision will be placed in the next meeting of the Senate for approval for its implementation from the next semester i.e. Even Semester of session 2009-2010.

Item No.2: To consider and approval the Scheme and Syllabi of Master of Computer Applications 5th and 6th Semesters.

The SCSA considered and approved the Scheme and Syllabi of 5th and 6th semesters of MCA Degree Programme effective from the academic session 2009-2010.

The meeting ended with a vote of thanks to the Chair

(R.P.S Lohchab)
Registrar and Secretary, SCSA

Approved

(M N Bandyopadhyay)
Director & Chairman, SCSA

Item 26.11 To approve revision in fee refund norms for admission withdrawal / cancellation for session 2015-16 onwards.

The Senate approved the fee refund rules for various UG, PG and Ph.D programs with minor amendments vide agenda item No 18.5 in its 18th Senate meeting held on 01.11.2011

The refund rule doesn't have provisions for admission taken in DASA/MEA/ICCR category where Institute fee is charged in term of ($ US Dollars). As the regular MBA/MCA programmes were started w.e.f. 2012-13 hence their refund rules need to be incorporated in line with the M.Tech programmes of the Institute.

The admission in various programmes normally conducted before start of the academic session hence the days to be counted for fee refund norms should be from the date of start of the academic session or date of admission whichever is later.

In view of above the following revision in the fee refund rules are proposed:

Proposed and Revised Fee Refund rules for candidates withdrawing from B.Tech. / M.Tech./MBA/MCA Regular Courses

Existing Fee Refund Rules		**Proposed Fee Refund Rules**	
No of days from admission date to withdrawal date of admission	**Existing norms for refund of fee. (Deduction of Amount)**	**No of days from start of academic session or date of admission whichever is later to the date of withdrawal of admission**	**Proposed revision in the fee for refund of fee. (Deduction of Amount)**
B. Tech. (Regular)		**B. Tech. (Regular)**	
3 days	**No deduction**	3 days	**Rs. 1000/-**
04 to 12 days	Rs. 3,000/-	04 to 12 days	Rs. 3,000/-
13 to 30 days	Rs.7 500/-	13 to 30 days	Rs.7,500/-
30 days or more	Only security to be refunded	30 days or more	Only security to be refunded.
M.Tech. (Regular)		**M.Tech./MBA/MCA (Regular)**	
3 days	Rs. 1000/-	3 days	Rs. 1000/-
04 to 12 days	Rs. 3,000/-	04 to 12 days	Rs. 3.000/-
13 to 30 days	Rs. 7,500/-	13 to 30 days	Rs 7,500/-
30 days or more	Only security to be refunded.	30 days or more	Only security to be refunded.

Proposed and Revised Fee Refund rules for candidates withdrawing from self-financing MBA / MCA Programmes and M.Tech/B.Tech/MBA/MCA (DASA/MEA/ICCR).

Existing Fee Refund Rules		Proposed Fee Refund Rules	
No of days from admission date to withdrawal date of Admission	**Amount to be deducted from students of MBA/MCA (Self Financed)**	**No of days from start of academic session or date of admission whichever is later to withdrawal date of Admission**	**Proposed Amount to be deducted in the case of M.Tech/B.Tech/MBA /MCA (DASA/MEA/ICCR) and MBA/MCA(Self Financed)**
Before the commencement of classes	**Rs. 1000/-**	**Up to 3 days**	**Rs. 1000/-**
Up to 15 days	Rs. 10,000/-	4 to 15 days	Rs. 10,000/-
Up to 30 days	Rs.16,000/-	16 to 30 days	Rs.16,000/-
Up to 45 days	Rs. 20,000/-	Up to 45 days/ Up to 15th September whichever is earlier	Rs. 25,000/-
Up to 15th September	Rs. 25,000/-	After 15th September	1) Only security to be refunded for Self Finance Programmes. 2) For DASA/MEA/ICCR, Normal semester fee would be deducted as applicable for regular/self financed courses whichever is higher from the fee paid Remaining fee along with Security fee would be paid.
After 15th September	Only security to be refunded		

The relevant part of minutes of the 18th meeting of the Senate regarding this agenda is enclosed as Annexure-26.11 from Page 117 to 119.

The senate may kindly consider and approve revision in the fee refund rule as above for all type of the admission categories for all the programmes of the Institute w.e.f 2015-16.

Recommending the Panel of Examiners for evaluation of Ph.D. theses to the Director through Controller of Examinations and thus dispensing with the role of BOS as in Rule 11.3 of the Ph.D. Ordinance.

Rest of the functions of the DRC shall remain the same as approved by the Senate vide Item No. 1.4.

(d) Functions of BOS:

Except for function mentioned under Sr. No.4 (ii) (pertaining to appointment of examiners) approved by Senate vide Item No. 1.3 in 1st Senate meeting, all other functions of BOS remain same.

Item 18.5: Fee refund rules for all programs (UG, PG & Ph.D.) to be included in the Prospectus.

The Senate approved the fee refund rules for UG, PG and Ph.D. programs with minor amendments as under to be included in the respective prospectus.

Fee Refund rules for candidates withdrawing from B.Tech. / M.Tech. Courses

No. of days from admission to withdrawal of admission	Amount to be deducted from students
B. Tech.	
3 days	No deduction
04 to 12 days	Rs. 3,000/-
13 to 30 days	Rs.7,500/-
30 days or more	Only security to be refunded
M.Tech.	
3 days	Rs. 1000/-
04 to 12 days	Rs. 3,000/-
13 to 30 days	Rs. 7,500/-
30 days or more	Only security to be refunded.

Fee Refund rules for candidates withdrawing from self-financing MBA / MCA Courses.

No of days from admission to withdrawal of Admission	Amount to be deducted from students
Before the commencement of classes	Rs. 1000/-
Up to 15 days	Rs. 10,000/-
Up to 30 days	Rs.16,000/-
Up to 45 days	Rs. 20,000/-
Up to 15th September	Rs. 25,000/-
After 15th September	Only security to be refunded

Fee Refund Rules for Ph.D students

In case of Ph.D students, there shall be no refund of fee if the registration is cancelled. However the security amount, if any, shall be refundable.

The Senate also constituted the following Committee to frame the refund rules for hostel fee

1. Dean (Students Welfare)	Convenor
2. Dean (Academics)	Member
3. Chief Warden (Boy's Hostels)	Member
4. Chief Warden (Girl's Hostels)	Member
5. Registrar	Secretary

The report of the committee is to be placed before the Senate in its next meeting after approval from the Chairman, Senate.

Item 18.6: Introduction of regular programs of MBA & MCA in the Institute.

The Senate approved the starting of regular MBA and MCA programs. Further, the Senate authorized the Hon'ble Director to constitute a committee to submit its recommendations to be placed before the Senate for consideration.

Item 26.12 To approve revision in re-appear examination fee for the students who have completed their normal duration of studies.

The Senate revised re-appear examination fee in its 16th meeting vide agenda item no 16.3 for the ex-students of the Institute who have completed their normal duration of studies but have yet to complete their regular programs.

It was observed since quite some time that the students who were having re-appear in most of the courses of the semesters were facing difficulty in paying their re-appear examination fee for all the courses of the particular semester in which they had re-appears. It has also been observed that sometimes students not having sufficient fee hence they restrict themselves for some courses only as re-appear examination.

It is proposed to reduce the fee for the re-appear examinations for such category of students so that they can appear in the requisite number of courses.

Sr. No.	Particulars of the Re-appear exam	Existing Re-appear fee	Proposed Re-appear fee
1	Before 30 days of start of the Examination.	1000/- Rs Per Paper	1000/- Rs Per Semester
2#	Before 15 days of start of the Examination.	1500/- Rs Per Paper	1500/- Rs Per Semester
3#	Before 10 day of start of the Examination of that course.	2000/- Rs Per Paper	2000/- Rs. Per Semester
4#	Before 3 days of start of the Examination.	5000/- Rs Per Paper	3000/- Rs Per Semester
5	Before 1 day of start of the Examination of that course.	-	3000/- Rs. Per Course

 # The senate didn't prescribed these rates in its 16th Meeting.

The relevant part of the minutes of 7th and 16th meeting of the Senate in this regard is enclosed as Annexure 26.12 from Page 121 to 123.

The Senate may kindly consider and approve revision in fee for re-appear examination for the students who have completed their normal duration of studies.

Item No. 7.14 To consider fixing up a minimum number of classes to be engaged for a course.

ANNEXURE-26.12

The matter was deliberated upon in details. Since engaging the classes is the ethical responsibility of teachers the consensus was such that it would not be worthwhile to fix a minimum number of classes to be engaged in a semester for a particular course. .

In view of all these consensus was to drop the matter.

Item No. 7.15 To consider and approve the norms for issuing the Duplicate Degree certificate and semester/overall Grade Report.

It was agreed upon in principle that the Academic Section should be empowered to issue duplicate degree certificate and grade reports.

The modalities and procedure was left to be advised by the Academic Section.

Item No. 7.16 To consider and approve the norms for issue of official Transcripts to the students Alumni.

The matter was agreed upon and the procedure for obtaining official transcripts was accepted as proposed in the agenda item 7.16.

Item No. 7.17 To consider modifications in the present Examination System (Ref. Item No. 5.13).

The report submitted by the committee was presented before the Senate and it was decided to reduce the preparatory days from present 9-10 days to 6 days.

Item No. 7.18 To consider modifications in the practice of filling up of Examination forms and late fee submission of Examination forms for the re-appearing Examinations.

The Senate felt that the practice of filling up of examination forms for the regular students is practically serving no useful purpose. Therefore, it was proposed that the present practice of submitting application forms by regular students (students studying in a particular semester after due registration at the beginning of the semester) be dispensed with. All students registered for a set of courses in a semester reach the stage of examination unless declared detained or ineligible by the Academic Section.

However, the students who are required to re-appear will have to fill up the forms as usual. The revised fee structure for filling up the examination forms for re-appearing in the subjects per semester as follows:

Days of filling the Examination forms		Existing (Rs.)	Proposed (Rs.)
(a)	30 days before the starting of the Examination	150	300
(b)	15 days before the starting of the Examination	300	500
(c)	10 days before the starting of the Examination	500	1000
(d)	3 days before the starting of the Examination	-	5000

The Senate approved the proposal with modifications.

Item No. 7.19 **To note the starting of the new M. Tech. Courses in the Environmental Engineering (Civil Engineering Department); Master of Business Management (Humanities & Social Sciences); M. Tech. (Robotics & Automation); M. Tech. (Nanotechnology) and UG Courses in Industrial Engineering & Management and Information Technology.**

The Chairman, Senate apprised the Senate of the status of the new UG and PG courses; M. Tech. Courses in the Environmental Engineering (Civil Engineering Department); Master of Business Management (Humanities & Social Sciences); M. Tech. (Robotics & Automation); M. Tech. (Nanotechnology) and UG Courses in Industrial Engineering & Management and Information Technology which have proposed to be started from this Session 2006-07.

4 Dr. K S Singh — Member
Professor
Humanities & Social Sciences Department
NIT, Kurukshetra

5 Dr. Surjit Angra — Member
Professor
Mechanical Engineering Department
NIT Kurukshetra

6 Dr. R S Bhatia — Member
Professor
Electrical Engineering Department
NIT, Kurukshetra

Item 16.1: To confirm the minutes of the 15th meeting of the Senate held on 03.07.2010

The Senate confirmed the minutes of the 15th meeting of the Senate held on 03.07.2010 as circulated to the members of the Senate and as per details furnished in the agenda item.

Item 16.2: To note the Action Taken Report on the minutes of the 15th meeting of the Senate held on 03.07.2010

The Senate noted the actions taken on the minutes of the 15th meeting of the Senate held on 03.07.2010 as per details furnished in the agenda item. While noting the action taken report under 15.2 the Senate observed that in future, the matter regarding the nomination to BOG be brought by the Secretary to the Senate well in advance prior to the expiry of the term of existing Senate nominated members.

Item 16.3: To consider and approve decisions taken in 30th to 33rd meetings of Standing Committee on Senate Affairs (SCSA)

The Senate considered the decisions taken in 30th to 33rd meetings of the Standing Committee on Senate Affairs. While considering the decision taken under Item 1 of the 31st SCSA meeting regarding the request of B.Tech 2006 batch students who have re-appear internal assessment in practicals, seminars and projects in Eighth Semester, it was decided that the students who have completed their B.Tech 8th Semester of studies are required to register at the beginning of the semester. Also they will have to pay the registration fee @ of Rs. 5000/- per practical/viva- voce per subject (including design, mini/major project) and @ of Rs. 1000/- per theory paper (including seminar). This will be effective from session 2011-12

Apart from above change, the Senate approved the decisions taken in 30th to 33rd meetings of Standing Committee on Senate Affairs.

Item 26.13 To approve revised syllabi of the courses offered by Department of Humanities and Social Sciences for B.Tech. programmes of the Institute.

The department of Humanities and Social Sciences has proposed a revis.on of Scheme and Syllabi of some courses offered by the department for B.Tech programmes of the Institute.

The same is duly approved by their Board of Studies (BOS) in its 23rd meeting held on 25.05.2015, under item no 3.1.

The letter received in this regard from the HOD, Department of Humanities and Social Sciences , minutes of 23rd meeting of their BOS and revised scheme and syllabi of some courses are enclosed as Annexure 26.13 from Page 125 to 135.

The modifications proposed are:

Sr No.	Course Code and Name of Course	Contact Hours		Remarks
		Existing	Proposed	
1.	HUT-107. Communication Skills in English	3(L),1(T)	2(L),2(T)	-
2.	HUT-322. Soft Skill Workshop	0(L),2(T)	Zero	**Caution** The course is proposed to be dropped as it is being offered to ***B.Tech. In IT*** Programme only.

The Senate may consider the revision in the scheme and syllabi as proposed by the department.

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES
NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA-136119

No. Hum & S.S/15/ 2 10 Date: 25.05.2015

Please find enclosed the revised syllabi (soft copy & hard copy) of the courses of the Department duly approved by the Board of Studies for further necessary action at your end.

25/05/15

(Vikas Choudhary)
HOD

Dean (Academics)

for Senate

Encl:

1. **Minutes of the BOS Meeting held on 15.05.2015**
2. **Soft copy & hard copy of the revised syllabus**

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES
NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA-136119

No. Hum & S.S/15/2..6 Dated: 22/05/15

Minutes of the 23rd meeting of the BOS in Humanities & Social Sciences held on 15.05.2015

The 23rd meeting of the Board of Studies of the Department of Humanities & Social Sciences, NIT, Kurukshetra was held on 15.05.2015 (Friday) at 10.30 AM in the office of the undersigned. The following attended the meeting:

1.	Dr. Vikas Choudhary	(In Chair)
2.	Dr. V. Upadhyay	External Expert
3.	Dr. Rajender Kumar	Member
4.	Dr. P.J. Philip	Member
5.	Dr. (Ms.) Kiran Mor	Member
6.	Dr. (Ms.) Shabnam	Member
7.	Dr. (Ms.) Geeta Sachdeva	Member
8.	Dr. Ashwani	Member

The following decisions were taken:

1. The minutes of 22nd meeting of Board of Studies were confirmed.
2. The list of Course-coordinators and Examiners of the department for May/June 2015 was approved.
3. The revision of the syllabi of courses of the department were considered and approved.
   - It was decided that the contact hours of the course, "Communication Skills in English" (HUT-107) be revised to 3(L):1(T) from 2(L):2(T).
   - The BOS was of the opinion that the course, "Soft Skills Workshop" (HUT-322) should be dropped as it is being offered to B.Tech. IT Branch only.
4. As per the decision of DRC, Ms. Savneet Sethia and Ms. Anshu Lochab presented the progress of their PhD work before the Board of Studies. The progress of both the candidates was found satisfactory.

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

22/05/15
(Vikas Choudhary)
HOD

Copy to:
1. All Members
2. Dean (Academic)

B.Tech Ist/ IInd Semester
(Common to all branches)

Communication Skills in English (HUT-107)

Theory: 50 Marks
Sessional: 50 Marks
Total: 100 Marks
Time: 3 hrs

Lecture: 3
Tutorial: 1

1. **Course code**: HUT 107

Title of the course: Communication Skills in English

Course Objectives: This course is designed to develop basic communication skills among engineering students. At the end of this course, the participants should be able to:

- Develop basic writing skills.
- Be informed of the latest trends in basic verbal and non verbal communication and language skills so that they will become highly confident and skilled writer.
- Develop skills of group presentation and communication in team.

Course Outline:

Unit 1 **(10)**
Building vocabulary
a. Choosing the right words
b. Words for specific contexts, foreign phrases
c. Synonyms and antonyms

Unit 2
Writing effective sentences **(10)**
a. Editing and proof reading
b. Punctuation and capitalization

Unit 3
Composition **(10)**
a. Writing book reviews
b. Article and essays
c. Short story writing based on inputs

Unit 4
Written communication **(10)**
a. Formal letters, applying for jobs, writing CV
b. Notices and memos
c. Report writing
d. Minutes of a meeting

Unit 5
Reading Comprehension **(10)**
a. Unseen passages
b. Excerpts etc.

Suggested Books:

English Pronouncing Dictionary by Daniel Jones. Cambridge University Press, 1996.

Oxford Advanced Learner's Dictionary. Oxford University Press, 2010.

Practical English Usage by Michael Swan. Oxford University Press, 1996.

Raymond Murphy's *Intermediate English Grammar, 2001.*

John Metchell's *How to Write Reports, 1981.*

R.C. Sharma's *Business Correspondence and Report Writing, 1998.*

R. Pal and Korlahall.'s *Essentials of Organisational Communication*, 2003

Saha Freeman's *written Communication in English, 2001.*

ENGINEERING ECONOMICS (HUT-109)
B.Tech 1st /2nd SEMESTER
(Common to all branches)

L(3) T(1)

Sessional: 50 Marks
Theory: 50 Marks
Total:100 Marks
Time: 3hrs

Course Objectives

The purpose of this course is to:

(i) introduce the students to the basic concepts of Economics, and

(ii) stimulate them to think systematically and objectively about contemporary economic problems

Note for the Paper Setter: Seven question to be set covering all the units (one question from each unit). The examinees shall have to attempt any five questions of their choice.

Unit-1 **Introduction and Basic Economic Terms:**
Definition of Economics, engineering economics: definition and scope, investment, types of efficiency; Foundations of engineering economy: Factors, basic methods of making economic analysis: present worth analysis, rate of return analysis; make or buy decisions approach; break-even analysis.

Unit-2 **Demand, Supply and Equilibrium:**
Meaning, law of demand and supply, equilibrium price and quantity, elasticity and its measurement, demand forecasting and its techniques

Unit-3 **Production Analysis:**
Factors of production, law of variable proportions, returns to scale, optimal combinations of inputs, production functions: Cobb-Douglas (CD) and Constant elasticity of substitution (CES)

Unit-4 **Cost and revenue analysis:**
Overhead cost, variable cost, total cost, average cost, marginal cost, opportunity cost, sunk cost. Shapes of cost curves, engineering cost curves; Revenue: concepts and types.

Unit-5 **Theory of firm and pricing:**
Equilibrium of firm and industry under various market conditions

Unit-6 **Indian Economy:**
National income: meaning and concepts; Banks: Functions of commercial banks and central bank; fiscal policy.

Unit-7 **International Trade and Finance:**
Theories of trade, trade barriers, exchange rate systems, balance of payments, business cycles

Suggested Books:

1. R Panneerselvam - Engineering Economics (PHI)
2. D. Salvatore - International Economics, John Wiley and Sons
3. Hal R. Varian- IntermedEate Microeconomics, W.W. Norton and Company
4. L. Blank and A. Tarquin. Engineering Economy, McGraw Hill
5. Amitdya Sen., Microeconomics: Theory and Applications, Oxford University Press
6. A. Koutsoyiannis, Modern Microeconomics, Macmillan
7. Stonier and Hague - A text book of Economic Theory (Longman's London)
8. G.A Tayler - Managerial and Engineering Economy (V.N Company)
9. M.L. Jhingan – Micro Economic Theory (S. Chand)
10. K.K. Dewett - Modern Economic Theory (S. Chand)
11. Ruder Dutt and Sundram - Indan Economy (S. Chand)

(Common to all branches, 3rd and 4th semesters of B.Tech.)

ORGANISATIONAL BEHAVIOUR
HUT-211

L	T
2	1

Theory:	50 Marks
Sessionals:	50 Marks
Total:	100 Marks
Time:	3 Hrs.

UNIT-I **INTRODUCTION**

Organizational Behaviour: concept, nature, contributing disciplines, challenges and opportunities for organizational behaviour

UNIT-II **INDIVIDUAL BEHAVIOUR**

Behaviour: concept and foundations of individual behaviour
Attitude: concept, components of attitude and work attitude. Job Satisfaction
Learning: concept and principles of learning.
Intelligence, Emotions, Emotional Intelligence

UNIT-III **PERSONALITY AND PERCEPTION**

Personality: concept, determinants, personality structure, personality characteristics in organization. Values
Perception: concept, factors influencing perception, perception and organizational behaviour. Perception and decision making, ethical decision making

UNIT-IV **GROUP BEHAVIOUR AND WORK TEAMS**

Group Behaviour: concept, types and group development
Work Team: concept, creating effective teams and types of teams
Conflict and Negotiations. Leadership: concept of leadership, leadership styles and emerging issues in leadership

UNIT-V **ORGANISATIONAL SYSTEM**

Organizational Culture. Organizational Commitment
Organizational Citizenship Behaviour (OCB)
Work Stress: concept, work stress model, coping with stress

UNIT-VI **MOTIVATION**

Motivation: concept, motivation and work behaviour. Applications of motivation: theories, work environment, employee involvement, rewarding employees

Books Recommended

1. Robbins, S.P. (2012) (14th ed.) "Organizational Behaviour: Concepts, Controversies & Applications" New Delhi: Pearson.
2. Luthans, F. (2005) (10th ed.) "Organizational Behaviour" New York: Mc Graw Hill.
3. Nelson, D.L. & Quick, J.C. (2008) (5th ed.) "Organizational Behaviour: Foundations, Realities & Challenges" New Delhi: Cengage Learning.
4. Aswathapa, K. (2012) (10th ed.) "Organizational Behaviour" Bombay Himalaya Publication House.
5. Prasad, L.M. (2000) "Organizational Behaviour" New Delhi: Sultan Chand& Sons
6. Andre, R. (2009) "Organizational Behaviour: An Introduction to Your Life in Organizations" New Delhi: Pearson.
7. Slocum, J.W. & Hellriegel D. (2007) "Fundamentals of Organizational Behaviour" New Delhi: Cengage Learning.
8. Newstrom, J.W. (2007) (12th ed.) "Organizational Behaviour: Human Behaviour at Work" Tata McGraw Hill.

B.Tech. (Common for all branches 5th/6th Semesters)

BUSINESS MANAGEMENT (HUT-311)

L	T
3	1

Theory : 50 Marks
Sessionals: 50 Marks
Total : 100 Marks
Time : 3 hours

Note to the paper setter: The number of questions to be set will be seven, one from each unit. Out of these one question will be compulsory. The examinees will be required to attempt the compulsory one and any other four questions. All questions shall carry equal marks.

UNIT-I **General Management and Environment**
Environment: Meaning of Environment, Constituents of Business Environment: Micro & Macro Environment. Social Responsibility of Business.
Management: Definition, Nature and Significance, Functions of Management. Henry Fayol's Principles of Management.

UNIT-II **Financial Management**
Meaning, Scope and Functions of Financial Management. Duties of Financial Executives. Management of Working Capital, factors affecting Requirements of Working Capital. Capital Structure Decisions. Sources of Finance: Long Term and Short Term Sources.

UNIT-III **Corporate Finance**
Financial Markets: Nature & Significance of Primary and Secondary Markets. Mutual Funds. Corporate Governance. Mergers, Acquisitions and Restructuring.

UNIT-IV **Human Resource Management**
Evolution of Human Resource Management (HRM), Recruitment: Meaning, Definition. Factors governing Recruitment, Recruitment Process. Selection: Meaning & Definition, Selection Process. Training & Development: Inputs in Training & Development. Identification of Training needs, Training Process and Training Methods.

UNIT-V **Recent Trends in Human Resource Management**
Talent Acquisition and Management, HRM & Organizational Effectiveness, Work Force Diversity, Stress Management. Challenges for Human Resource Management.

UNIT-VI **Marketing Management**
Nature, scope and importance of marketing management. Modern Marketing concepts, Marketing Mix. Marketing Information System, Role of Social Media & E-Marketing, Meaning, nature and scope of International Marketing

Suggested Books:

1. Business Environment – Francis Cherunilam (Himalaya Publishing House)
2. Management - Harold, Koontz and Cyril O'Donnell (McGraw Hill)
3. Principles and Practice of Management – L.M. Prasad
4. Management- Stephen. P. Robbins & Mary Coulter (Pearson Education Inc, Publishing as Prentice Hall)
5. Principles of Management- PC Tripathi & PN Reddy (Tata McGraw Hill Education)
6. Financial Management – I.M. Pandey (Vikas Publishing House, New Delhi)
7. Financial Management: Theory & Practice--Prasanna Chandra (Tata McGraw Hill)
8. Financial Management—MY Khan & PK Jain (Tata McGraw Hill)
9. Essentials of Financial Management—James Van Horne (Prentice Hall)
10. Handbook of Human Resource Management- Michael Armstrong (Kogan Page Limited)
11. Human Resource Management- Gary Dessler, Biju Varkkey (Pearson)
12. Principles of Personnel Management – Edwin B. Flippo (Tata McGraw Hill)
13. Human Resource Management: Text and Cases—K Aswathappa (Tata McGraw Hill)
14. Personnel Management – C.B. Mamoria (Himalaya Publishing House)
15. Marketing Management- -Philip Kotler (Pearson Education India)
16. Marketing Management—Rajan Saxena (Tata McGraw Hill)
17. Basic Marketing – Cundiff and Still (PHI, India)
18. Marketing Management – S.A. Sherlekar (Himalaya Publishing House)

B. Tech. 6th Semester (Information Technology)

IIUT-322 Soft Skills Workshop

L	T	P
-	2	-

The course is framed to develop soft skills of students to a level when they can communicate effectively in professional and social situations orally as well as in writing. Keeping in mind the wide variation in the backgrounds of participating students the contents and the approach have been kept flexible and may be modified by the teachers to suit individual needs.

Introduction to the process of communication, types of communication, common barriers and their remedies. Verbal and non-verbal communication: common errors in usages and syntax: figurative use of language. Learning pronunciation stress and intonation through language lab. Body language - its importance and effective use in verbal communication.

Writing technical papers and reports for publication. Preparation of reports/papers for oral presentation- common errors and misconceptions. Especially in power point presentation Handling questions.

Group discussion: dos and don'ts for participation in a GD. Preparing a CV/Resume and writing a job application. The art of interview performance

Item 26.14 To consider modifications in Ph.D. ordinance.

Some suggestions have been received from the Heads of Electronics & Communication Engg. and Computer Application department regarding modifications in Ph.D. ordinance. The suggestions as received are being presented below:

Sr. No.	Existing	Proposed	Justification
1.	R-3.3 (g) Ph.D research scholar receiving institute scholarship will receive it for a duration of two years, which may be extendable to 3rd year if the research scholar has published at least one paper to acceptance/publication before the start of 3rd year and can be extended/resumed in 4th year if the research scholar has published at least two/one research papers respectively before the start of 4th year.	.... published/accepted for publication within 30 months of his/her initial registration for continuing the scholarship	Clause R-6 the scholar is required to pass at least four PG courses (min. 12 credits) and Clause 2 Gen. (12) is that a Scholar must submit his research plan propose and pass the comprehensive exam with in 12-18 months of initial registration.
2.	Ph.D admission once in a year	Ph.D. admission twice in a year	Balancing of course work Probability of getting good scholars during July
3		Part-time students must be counted as ½ seat for the supervisor.	The supervisor is devoting less time in their supervision and also their minimum submission time is larger than the full time students.
4		Co-supervised students must be counted as ¼ seat for the supervisor as he is devoting just 50% of the time for a co-supervised student than he does for a full time single supervisor student.	

The letter received in this regard from the Heads of Electronics & Communication Engg. and Computer Application department are enclosed as Annexure 26.14 from Page 137 to 139.

The Senate may consider the above proposal.

ANNEXURE-26.14

Department of Computer Applications
National Institute of Technology
Kurukshetra-136119

No. DCA/2015/252 Dated: 10-09-2015

Subject: Senate agenda

With reference to your letter No/ Acad./2015/4047 dated 04.09.2015, the department requires you to include the following items in the agenda of senate if possible:

1. Ph.D. admission should be twice in a year like earlier.
2. Part-time students must be counted as ½ seat for the supervisor as the supervisor is devoting less time in their supervision and also their minimum submission time is larger than the fulltime students.
3. Co-supervised students must be counted as ½ seat for the supervisor as he is devoting just 50% of the time for a co-supervised student than he does for a full time single supervisor student.

HOD

10.09.15

Dean Academics

To Senate Agenda

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, KURUKSHETRA

No. ECE/15/ 913 dated 11.09.15

A meeting of the DRC was held on 10.09.15 at 04.30pm in the conference room. Following members were present:

1.	Dr. Rajon Pandey	Head of the Department
2.	Dr. B.J. Singh	Member
3.	[redacted]	[redacted]
4.	Dr. Umesh Ghanekar	Member
5.	Dr. Mohd. Arif	Member
6.	Dr. N. P. Singh	Member

Dr. R.K. Sharma was on leave and Dr. A.K. Gupta could not attend the meeting.

Following decisions were taken:

1. The DRC considered the request of Mr. Ashok Kumar regarding extension for passing one course and recommended it for consideration under R-21.4.
2. The DRC considered the case of allocation of scholarship to Mr. Hari Mohan Gaur and recommended the grant of scholarship as per Institutes rules.
3. Under any other item, Prof. B.J. Singh submitted a proposal (Annexure-1) regarding eligibility for Institute scholarship to be forwarded as the agenda item for senate meeting. The matter was discussed by the DRC and passed the proposal to relax the condition of publishing at least one paper before the start of third year to acceptance/ Publication of at least one paper within 30 months of initial registration.

(N.P Singh)
Member

(M Arif)
Member

(Umesh Ghanekar)
Member

(O.P. Sahu),
Member

(B.J. Singh)
Member

Rajon Pandey
Head of the department

Dean (Academic)

15.09.15

Item 1. { R-2.4 doesn't fall under the purview of DRC. To be discussed with the Director.

2. Check the status of Mr. Hari Mohan Gaur

3. Senate Agenda

Dated: 10.09.15

Subject: Agents item for senate meeting

Ref.: R-3.3(g) Eligibility for Institute Scholarship-regarding
It reads as follows:
"Ph.D. research scholar receiving institute scholarship will receive it for a duration of two years, which may be extendable to 3rd year if the research scholar has **published** at least one research paper before the start of 3rd year and can be extended / renewed in 4th year, if the research scholar has published at least two / one research papers respectively before the start of 4th year".
Clause R-8 reads, "The scholar is required to pass at least four PG courses (minimum 12 credits)".
Clause 2, General (12) reads, "A scholar must submit his research plan proposal and pass the comprehensive examination within 12-18 months of initial registration".

Meeting the requirements of Clause R-8 and Clause 2 General (12), and concurrently, **publishing** at least one paper in non-paid SCI journal/fully refereed journals of repute before the start of 3rd Year is practically very difficult for an ordinary research scholar.

A proposal is hereby submitted to relax the condition of publishing at least one paper to acceptance/publication of at least one paper within 30 months of his/her initial registration for continuing the scholarship.

Submitted for kind consideration please

Brahmjit 10.9.15
(Brahmjit Singh)
Professor, ECE Deptt.

NATIONAL INSTITUTE OF TECHNOLOGY KURUKSHETRA

TABLE AGENDA

For

26th MEETING OF SENATE

Venue of meeting **Senate Hall, NIT, Kurukshetra**

Date & Time **29th September, 2015 at 11.00 a.m.**

NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA-136119

INDEX

Item 26.15 To note the nomination of three educationists of repute as member on the Senate of the Institute.

As per clause 14 (d) of the NITs Act 2007, the Senate of the Institute shall consist of three persons, one of whom shall be a woman, not being employees of the Institute to be nominated by the Hon'ble Chairperson, Board of Governors, NIT Kurukshetra in consultation with the Director of the Institute from amongst educationists of repute, one each from the field of science, engineering and humanities.

Accordingly, the Hon'ble Chairperson (Acting), BOG & Director has been pleased to nominate the following educationists of repute on the Senate of the Institute w e f. 4.9.2015.

1. Prof. Kondun Raja Rajeswari (From Engineering side)
   (Former Professor & Head, Andhra Univ.)
   Professor, Department of Electronics & Comm. Engg. & Principal
   Viswanadha Institute of Technology and Management.
   Mindivanipalem Village, Anandhapuram Mandal
   Visakhapatnam-531 173

2. Prof. Yashwant Sing (From Science side)
   Distinguished Professor
   Department of Physics
   Banaras Hindu University
   Varanasi-221005

3. Prof D K Nauriyal (From Humanities side)
   Department of Humanities & Social Science
   Indian Institute of Technology Roorkee
   Roorkee-247 667

The Senate may please note.

Item 26.16 To note the approval of Board of Governors for increasing the number of Ph.D. Scholarships in each department of the Institute.

The Senate in its 25th meeting held on 24th February 2014 vide item no. 25.12 decided that the proposal for creating of more scholarship for each department for Ph.D. students will be put before the Finance Committee and Board of Governors for its consideretion. Accordingly, the item was put up before the Finance Committee.

The Finance Committee in its 31st meeting held on 8.5.2015 vide item no. 31.6 recommended as under:

"The Finance Committee recommended to the Board the incressed number of Ph.D. Scholarships in each department of the Institute as per agenda item."

Further, In 36th meeting of the Board of Governors held on 8.5.2015, vide Item no. 36.17, the Board has approved the minutes of Finance Committee meeting.

The relevant part of the minutes of the meeting of the Board and notification of FC is enclosed as Annexure-26.16 from Page 3 to 4.

The Senate may note the approval of the Board of Governors.

ANNEXURE-26.16

NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA- 136119

No./AC-1/2015/2-631 Dated: September 17, 2015

NOTIFICATION

The Finance Committee of the institute in its 31st meeting held on 08.05.2015 has recommended as under:

"The Finance Committee recommended to the Board the increased number of Ph.D Scholarships in each department of the Institute as per agenda item."

The above decision is circulated for compliance reference decision of the Board of Governors.

Deputy Registrar (Accounts)

Deputy Registrar (Academics)

Recd on 18/09/15

Any other Item

36.17 **To consider and approve the minutes of 31st meeting of the Finance Committee, National Institute of Technology, Kurukshetra held on 08.05.2015.**

The Board confirmed the minutes of the 31st meeting of the Finance Committee of National Institute of Technology Kurukshetra held on 08.05.2015.

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

19.5.15

(Shyam Narayan)
Registrar-cum-Secretary
BOG, NIT Kurukshetra

(Anand Mohan) 19/5/15
Director

(A. Sivathanu Pillai) 20/5/15
Hon'ble Chairperson
BOG, NIT Kurukshetra

Item 26.17 To note the approval of Ministry of Human Resource Development, Govt. of India regarding uniformity in duration for payment of fellowship to all research scholars.

In Ph.D. ordinance under Rule 3.3 (h) regarding Eligibility for Institute Scholarship, it is mentioned that

'Recommendation of extension/resumption of scholarship after second and third year will be done by DRC after considering the criteria. Extension/resumption of scholarship is subject to its availability on the date of receiving recommendation from the DRC. No Institute Scholarship will be given after 4th year'.

MHRD vide letter no F.No. 17-2/2014-TS.-1 dated 1st September, 2015 has given instructions and clarified to have a uniform duration of 5 years for payment of fellowship (JRF/SRF) to all research scholars irrespective of whether they are B.Tech./M.Sc. degree holders or M.Tech. degree holders.

The letter of the MHRD is enclosed as Annexure 26.17 on Page 6.

The Senate may kindly note the approval of the MHRD, Government of India and approve relevant amendment in the Ph.D. ordinance related to fellowship (Scholarship).

ANNEXURE-26.17

F. No. 17-2/2014-T.S.-I
Government of India
Ministry of Human Resource Development
Department of Higher Education
Technical Section-I

Shastri Bhawan, New Delhi
Dated the 7th September, 2015

To,

The Chairman, AICTE,
The Directors, IITs (As per standard list),
The Directors, IIITs (As per standard list),
The Director, IISC, Bangalore,
The Directors, IISERs (As per standard list),
The Directors, NITs (As per standard list),
The Director, NITIE, Mumbai,
The Director, ISM, Dhanbad,
The Director, NERIST, Nirjuli, Arunachal Pradesh,
The Director, SLIET, Longowal,
The Director, NIFFT, Ranchi,
The Director, NITTRs (as per standard list),
The Directors, SPAs (as per standard list),
The Director, IIEST, Shibpur.

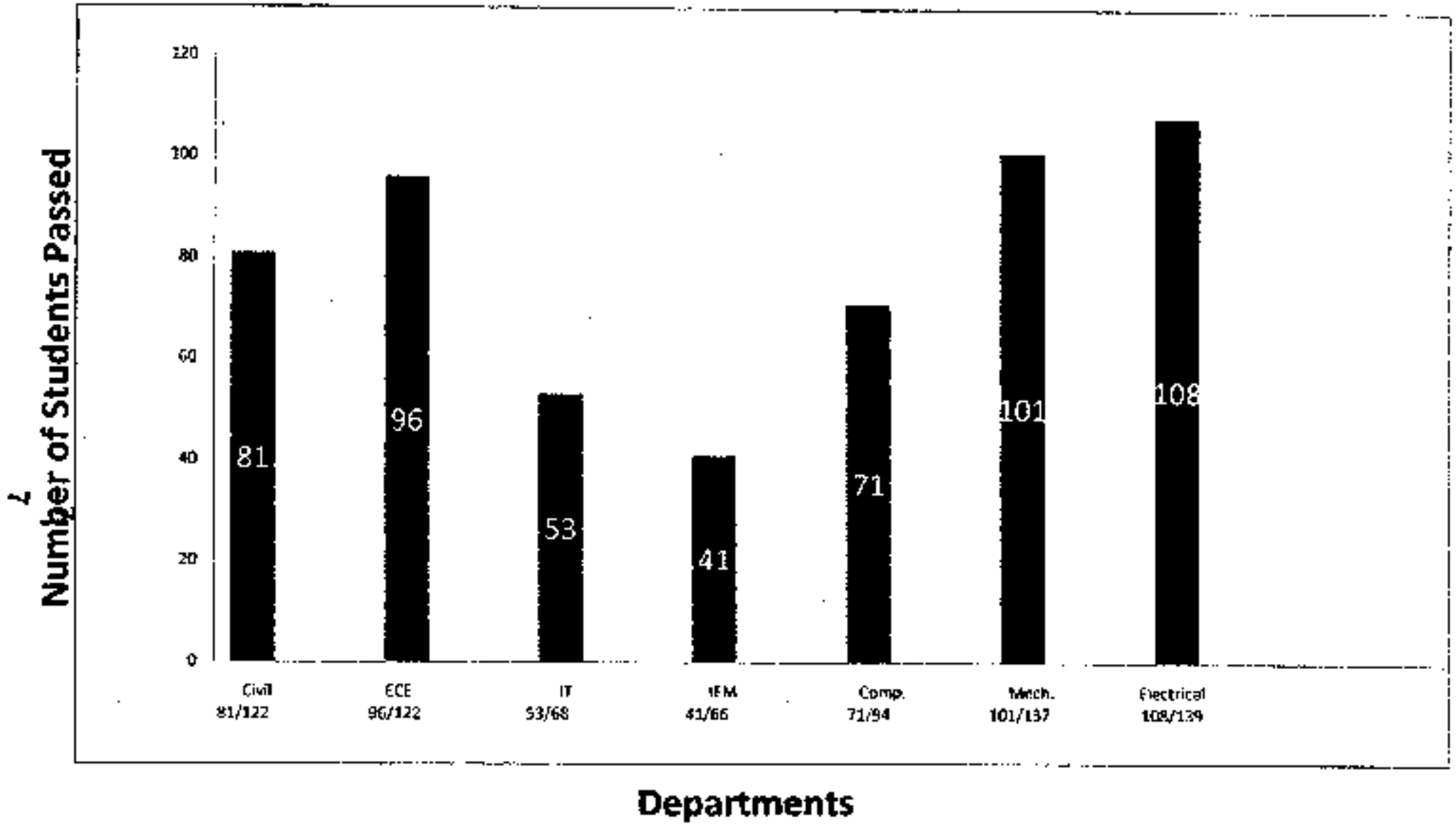
Subject: Revision of rates of Ph.D. Scholarship in AICTE funded and Centrally Funded Technical Institutions under the Ministry of Human Resource Development

Sir,

I am directed to refer to this Department's letter of even number dated 10th July, 2015 and to say that the matter has been examined further and it is clarified with the approval of the Competent Authority to have a uniform duration of 5 years for payment of fellowship (JRF/ SRF) to all research scholars irrespective of whether they are B.Tech./ M.Sc degree holders or M.Tech. degree holders.

Yours faithfully,

(Prisca Mathew)
Under Secretary to the Government of India
Ph. No. 011-23381698



Branchwise Result of B.Tech. (Batch 2011-2015)