Sub: **Proposed Guidelines for Awarding Best Project Award**

As per Senate decision of 35th meeting held on 31.05.19, a committee was constituted by Hon'ble Director for framing guidelines for awarding Best Project Award for UG students and notified by Dean (Acad) vide letter No. Acad.)/641 dated 12.06.2019. In this regard, the committee held its meetings on 17.06.2019 at 04.00 pm and 23.08.2019 at 4.30 pm in the office of the undersigned.

After deliberations on the subject matter, the following guidelines are proposed for awarding Best Project Award for UG students:

1. Applications for the Best Project Award for UG students will be invited through a notification issued by the HoD in the 2nd last week of VIII semester. The students having their Project in VII sem / VIII sem will be asked to apply.
2. Only those students who apply in response to the notification would be considered for the Best project award.
3. The applicants would be evaluated by a committee to be appointed by the HOD. The committee would consist of (i) HoD / nominee of HoD, (ii) One senior most faculty from each of the specialised areas of the Department, and (iii) One Director's nominee of the rank of Professor from other Engineering Departments.
4. Evaluation of the applicants would be made by the committee within a week of the end semester examination of the Project.
5. The committee would specifically take into consideration the following points while evaluating the project.

Point	Description	Marks out of 100
a.	Project report submitted by the student to the project supervisor which should comprise (i) Introduction, Need / Importance of the project, Objectives and scope of the work, (ii) Literature Review, (iii) Methodology of project, (iv) Experimental program / data collection / physical model development / project design & implementation (v) Results & discussion, (vi) Modelling of results, if any, & (vii) Conclusions & scope for future study, (viii) References. Plagiarism of the project report as certified by the Institute Library should be less than 20%.	30
b.	Presentation made by the student. In case of any physical model or software program developed in the project, the running of the model / program will also be demonstrated by the student to the committee.	25
c.	The contents of the project exhibiting: • Application of the knowledge gained in previous semesters : 10 • Patent filed . 10 • Innovation · 5 • Benefit to society : 5	30
d.	Paper publication / acceptance out of the project work. • Scopus / SCI /SCIE indexed journals (non-paid) : 15 • Refereed Journal (non-paid) : 8 • Any Journal / IIT, NIT, Equivalent / Scopus Indexed Conference : 6 • Any Conference : 4	15

6. Minimum marks to qualify for the Best Project Award will be 50.

(S.N. Sachdeva) (L.M. Saini) (P.C. Tiwari) (Mayank Dave) (N.P. Singh)

(S.N. Sachdeva) 23.8.19
Chairman of the Committee

Dean (Academic)

S 36.10 To consider the issue for discontinuation of Survey Camp in B.Tech. 3rd year, Civil Engg. scheme.

The minutes of BOS meeting of Civil Engg. Deptt. held on 29.5.2019 has been received in Academic section vide which the report of the committee was considered. The said committee was constituted by the Departmental Advisory Committee of the department to decide the issue of Survey Camp in B.Tech. 3rd year (Civil) scheme. The minutes of the BOS along with the Report of the Committee is enclosed as Annexure S 36.10 from page 47 to page 52. The BOS decided as under:

> "The BOS considered the report of the Committee on the matter regarding discontinuation of Survey Camp in B.Tech. 3rd year scheme. The BOS approved the report of the Committee and recommended to discontinue the course related to Survey Camp in B.Tech. 3rd year scheme w.e.f. 2019 admission batch. The total credits for Civil Engineering Scheme would remain the same and the credits for Survey Camp would be shifted to Programme Elective 1: CEPE39 Computational Practical as detailed in the Report".
>
> The Senate may consider the recommendations of the BOS and decide.

Item To consider the discontinuation of Survey Camp in B. Tech. 3rd Year Scheme. **Annexure 5.36.10**

The Departmental Advisory Committee vide its meeting 03/2019 dated 22.04.2019 constituted a Committee to decide the issue of Survey Camp in B. Tech. 3rd year (Civil) Scheme. The Report of the said Committee was considered by the BOS vide its meeting 01/2019. The minutes of the BOS alongwith the Report of the Committee is enclosed as Annexure-I. The BOS decided as under:-

> *"The BOS considered the report of the Committee on the matter regarding discontinuation of Survey Camp in B. Tech. 3rd Year Scheme. The BOS approved the report of the Committee and recommended to discontinue the course related to Survey Camp in B. Tech. 3rd year Scheme w.e.f. 2019 admission batch. The total credits for Civil Engineering Scheme would remain the same and the credits for Survey Camp would be shifted to Programme Elective I: CEPE39 Computational Practical as detailed in the Report".*

The above recommendations of the BOS may be considered and approved by the Senate.

DEPARTMENT OF CIVIL ENGINEERING
N I T KURUKSHETRA-136119

No. CED/BOS/2019/632 Dated: 29.05.2019

Minutes of the meeting of the Board of Studies (BOS) (01/2019) in Civil Engineering, NIT Kurukshetra, held on 29.05.2019.

A meeting of the BOS (01/2019) was held of the Department on 29.05.2017 at 11.30 a.m. in the Conference room of the Department.

The following were present in the meeting:

1. Prof. S.N. Sachdeva, Professor & Head ... In Chair
2. Prof. V.K. Arora, Professor ... Member
3. Prof. Baldev Setia, Professor ... Member
4. Prof. S.K. Madan, Professor ... Member
5. Prof. K.K. Singh, Professor ... Member
6. Prof. Subodh Ranjan, Professor ... Member
7. Prof. Anupam Mital, Professor ... Member
8. Prof. S.M. Gupta, Professor ... Member
9. Prof. Arun Goel, Professor ... Member
10. Prof. S.K. Patidar, Professor ... Member
11. Prof. Ashwani Jain, Professor ... Member
12. Prof. Mahesh Pal, Professor ... Member
13. Prof. Surinder Deswal, Professor ... Member
14. Prof. Praveen Aggarwal, Professor ... Member
15. Prof. Saraswati Setia, Professor .. Member
16. Prof. Paratibha Aggarwal, Professor ... Member
17. Dr. N.K.Tiwari, Associate Professor ... Member
18. Dr. Babita Saini, Associate Professor ... Member

The following decisions were taken:

1. The BOS recommended the change in name of M. Tech. (Civil) specialization of "Soil Mechanics & Foundation Engineering" to "Geotechnical Engineering" in line with the current nomenclature used in premier Institutes. The changed nomenclature would be effective from Session 2020-21 since the admission process for the session 2019-20 has already started.

2. The BOS approved the Scheme & Syllabi of M. Tech. Programmes in Civil Engineering to be effective from session 2019-20. The Scheme has been revised taking into consideration the suggestions and recommendations from the experts for the audit of PG Programmes, and the stakeholders. A copy of the revised Scheme & Syllabi is enclosed as Annexure-I.

3. The BOS recommended that the courses of (i) Advanced Mathematics and (ii) Communication Skills in English if offered by concerned Departments would be beneficial to PG students of the Department.

Contd...P/2

4. Any other item

1. The BOS considered the report of the Committee on the matter regarding discontinuation of Survey Camp in B. Tech. 3rd Year Scheme. The BOS approved the report of the Committee and recommended to discontinue the course related to Survey Camp in B. Tech. 3rd year Scheme w.e.f. 2019 admission batch. The total credits for Civil Engineering Scheme would remain the same and the credits for Survey Camp would be shifted to Programme Elective I: CEPE39 Computational Practical as detailed in the Report. A copy of the Report alongwith the revised scheme is enclosed as Annexure-II.

2. The BOS decided to have a review of the B. Tech. Scheme due to some difficulties / anomalies in the existing Scheme as pointed out by the Faculty as well as students.

3. In line with the decision taken by SCSA in its 57th meeting held on 03.05.2019 vide 57.03, BOS decided that the students of 2017 batch onwards may opt for a maximum of two online courses on NPTEL / SWAYAM against Open Electives offered in B. Tech. 7th and 8th Semester, out of the list made available by CED subject to approval of the HOD.

The minutes of the meeting were confirmed for further processing of the matters.

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

(S.N. Sachdeva)
Professor & Chairman
BOS in Civil Engineering

Encl: Annexure-I & Annexure-II

1. All members of the BOS in Civil Engg.
2. Dean (Acad.) for further necessary action.

Annexure-II

DEPARTMENT OF CIVIL ENGINEERING
N I T KURUKSHETRA-136119

No. C/620 **Date:** 27.05.2019

Subject: B.Tech 5th Semester (Civil) course of Survey Camp – Regarding

Reference: Letter No. CED/DAC/2019/482 dated 29.04.2019 regarding constitution of committee by the DAC (03/2019) to decide the issue of Survey Camp

This is in reference to the committee constituted by the DAC (03/2019) held on 12.04.2019 to decide the issue of Survey Camp in B.Tech. 3rd year (Civil) scheme.

The Committee met on 27.05.2019 to deliberate the issue. The following points were discussed to decide the matter.

1. All the data collected by total stations are processed by using softwares for preparation of contour maps, topographic maps etc. in laboratory, whatever be the type of topography used for surveying. Further, the use of total station allows students to shift to new location by different methods, i.e. resection and orientation by coordinates, thus avoiding the need of old plane table based surveying. Since the type of topography does not have any bearing on the learning process because of the use total station for collecting data and of softwares for plotting, therefore, the requirement of conducting survey camp becomes needless.
2. With advancement of technology and availability of high-end total stations, students are learning to collect the location data within campus during the 4th semester studies. Thus, there is no need to repeat the same exercise by conducting survey camp.
3. With the continuous increase in student intake, the logistics of the conduct of survey camp outside have increased manifold for making arrangements for transportation, boarding and lodging for the staff and students, and also due to non-availability of suitable camp sites at the dersired time.

In view of above, the committee recommends that the course related to survey camp be dropped in the scheme of examination of B.Tech. 5th semester (Civil). Further, since the students need more time in teaching schedule to effectively learn and work on different softwares related to various specializations of civil engineering while studying Programme Elective I: CEPE39 Computational Practical, taught in 5th semester, the following changes be effected in the scheme therein to maintain the total credit count.

Course No.	Subject	L	T	P/D	Total	Credit Points	Remarks
CEPE39	Computational Practical	0	0	2	2	1	**Existing**
CEPE39	Computational Practical	0	0	4	4	4	**Proposed**

(K K Singh) (Ashwani Jain) (Mahesh Pal)

Civil Asst/HOD for Dr Ashwani Jain as per discussion

Chairman DAC

Ind. Asst. K.

Enclosed: Existing and proposed Scheme of examination of B.Tech. 5th Sem. Civil Engg.

Sh. Puran for placing it BOF on 29.5.19

SCHEME OF EXAMINATION FOR B.TECH. V – SEMESTER (CIVIL) DEGREE COURSE - **proposed**

Course No.	Subject	Teaching Schedule				Credit Points
		L	T	P/D	Total	
CEPC31	Design of Concrete Structures – II	3	0	2	5	4
CEPC33	Geotechnology – I	3	1	0	4	4
CEPC35	Hydrology & Water Resources Engineering	3	1	0	4	4
CEPC37	Sewerage & Sewage Treatment	3	1	0	4	4
CEPC39	Transportation Engineering – II	3	1	0	4	4
CELR31	Geotechnology (Practical)	0	0	2	2	1
CELR33	Transportation Engineering – II (Practical)	0	0	2	2	1
CEPE39	Programme Elective – I (Computational Practical)	0	0	4	4	4
	Total	**15**	**4**	**10**	**29**	**26**

SCHEME OF EXAMINATION FOR B.TECH. V – SEMESTER (CIVIL) DEGREE COURSE - **Existing**

Course No.	Subject	Teaching Schedule				Credit Points
		L	T	P/D	Total	
CEPC31	Design of Concrete Structures – II	3	0	2	5	4
CEPC33	Geotechnology – I	3	1	0	4	4
CEPC35	Hydrology & Water Resources Engineering	3	1	0	4	4
CEPC37	Sewerage & Sewage Treatment	3	1	0	4	4
CEPC39	Transportation Engineering – II	3	1	0	4	4
CELR31	Geotechnology (Practical)	0	0	2	2	1
CELR33	Transportation Engineering – II (Practical)	0	0	2	2	1
CEPE39	Programme Elective – I (Computational Practical)	0	0	2	2	1
CELR35	Survey Camp	-	-	-	-	3
	Total	**15**	**4**	**8**	**27**	**26**

S 36.11 To note the approval of Chairman, Senate for allowing to opt maximum 'D' grade in the courses of B.Tech. programmes under old scheme

The institute modified minimum attendance rules vide notification dated 22.8.2017 (copy attached). The modified rules were applicable from academic session 2017-18 onwards. The students having attendance less than 50% in any course has to compulsorily repeat the course along with junior batches.

The institute also revised scheme and syllabi for all B.Tech. programmes from academic session 2017-18 and M. Tech. programmes from academic session 2019-20. The teaching departments normally do not offer B.Tech. courses of old scheme in regular mode for detained students.

Some students of B.Tech. 2016 and previous batches, who were having less than 50% attendance in some courses of previous semesters, requested that they may be allowed to opt maximum 'D' grade in odd semester courses along with regular examination of 7th semester in Nov./Dec. 2019.

The Chairman, Senate approved that

1. *The students detained in any course of any semester may be allowed to opt maximum 'D' grade which was available for them under previous attendance rules.*
2. *The students may be allowed to appear in re-appear examination and sessional improvement tests for detained courses of previous semesters along with regular examinations in respective odd and even semesters.*

The relevant pages are enclosed as Annexure S 36.11 from page 54 to 60.

The Senate may note the approval.

Annexure S 36.11

OFFICE OF THE DEAN (ACADEMIC)
NATIONAL INSTITUTE OF TECHNOLOGY KURUKSHETRA

No. D(Acad.)/2017/ 495 Dated: 21.8.2017
22

The Senate in its 30th meeting held on 6.6.2017 vide item no. 30.04 approved proposal of criteria of minimum requirement of attendance for being eligible to appear in the semester examinations as given below:

Minimum requirement of attendance for being eligible to appear in the semester shall be 75%.

However, this may be relaxed upto a maximum of 10% i.e. upto 65% by director. Those having attendance below 65% are not allowed to appear for the end-sem examination of that/those course (s) and shall be notified as 'Detained'. All such stud depending upon their attendance shall be further categorized into two categories A & E follows:

Category A: (Attendance between 50 % to 64 %) A student has two options

Option 1: To repeat the course through classroom/lab studies and obtain whatever g he can obtain

Option 2: He/She is permitted to attend classes of the next semester and can appe the mid-semester examinations of that/those course(s) when the opportunity is avai However, such student is restricted to a grade of 'D' only.

Category B: (Attendance below 50 %)Such students have to mandatorily repeat that/ course (s).

A Tabular presentation is given below:

Attendance	Course of Action
75%or more	Eligibleto appear for the End- semester examination
65% - 74%	Eligible to appear for the End- semester examination wi permission of the Director
50% - 64%	Detained Two options a) Repeat the course (s) through classroom / lab teaching b) To appear for mid-semester examinationin tha course(s) and settle for a max of 'D' grade
Below 50%	Detained To repeat classes

22/8/
Dean (Acad

Copy to:

21/8/17

1. All Notice Boards
2. All HODs/Coordinators
3. All Deans
4. Prof. I/C (Exam.)
5. Prof. I/C (Acad.)
6. DR (Acad.)
7. DR (Acs.)
8. Sr.Secretary to Registrar
9. Sr. Secretary to Director for kind information of the Director

August 21, 2019

PUC is the application received from Mr. Himanshu Chauhan, Roll no. 11610019 a student of B.Tech. (Civil Engineering) of 2016 batch regarding detaintion in the courses of previous semesters under old scheme and syllabi.

The institute modified attendance rules vide notification dated 22.08.2017 applicable on all the batches irrespective of scheme and syllabi from academic session 2017-18. The students having attendance less than 50% in any course is required to repeat the course compulsory along with junior batch. The institute also revised scheme and syllabi for all the B.Tech. programmes from academic session 2017-18. The old scheme and syllabi in regular mode is practically ~~not possible~~ difficult for students of B.Tech. programmes of 2016 or previous batches along with new scheme and syllabi in regular even and odd semesters.

Mr. Himanshu Chauhan of 2016 batch of B.Tech. Civil Engineering was detained in his 5th semester due to shortage of attendance during odd semester academic session 2018-19. His attendance in 5th semester in most of the courses is below 50% as he couldn't attend classes on medical ground. Under the revised attendance rules he is required to compulsorily repeat 5th semester courses in academic session 2020-21 along with 2018 batch students of B.Tech. (Civil Engineering). Since the students of all the programmes of B.Tech. from 2017 batch onwards are governed by revised scheme and syllabi therefore, the courses of old scheme and syllabi will not be offered by the teaching departments. The civil engineering department will not offer 5th semester courses in academic session 2020-21 in regular mode applicable on the students of 2016 or previous batches. The similar issues may arise in case of other teaching departments in any semester with any student of 2016 or previous batch. Practically it is difficult for teaching departments to offer old courses in regular mode along with new courses. Mr. Himanshu Chauhan requested to opt Maximum "D" grade in 5th semester courses where his attendance is below 50%.

In view of the above and the issue involved with old scheme and syllabi it is proposed for the students of 2016 or previous batches that:

1. The students detained in any course of any semester may be allowed to opt maximum "D" grade which was available for them under previous attendance rules.
2. The students may be allowed to appear in re-appear examination and sessional improvement tests for detained courses of previous semesters along with regular examinations in respective odd and even semesters.
3. A notification in this regard may be issued and applications from the students may be invited.

Submitted for kind perusal and approval, please.

DR (Academic) 21/08/19

Supdt. (Academic)

Prof. I/C (Academic)

Dean (Academic) 22/8/2019

23/8/19

Director 23/8/19

55

NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA

No. Acad./19/956 August 27, 2019

NOTIFICATION

The students of B.Tech. 2016 or previous batches having detained in the courses under old scheme and syllabi and having attendance below 50% in these courses from academic session 2017-18 are required to repeat these courses in the respective regular semesters.

The institute revised the scheme and syllabi for all the B.Tech. programmes from academic session 2017-18. The old scheme and syllabi in regular mode is practically difficult to be offered along with new scheme and syllabi of B.Tech.

The above category of students is hereby informed that competent authority after detained deliberations allowed the students to opt maximum "D" grade in the detained courses. Accordingly, they are required to submit option from for maximum "D" grade (copy attached) at Students Help Desk before start of 1st Mid Semester Exam-I for Odd Semester courses.

The above change will be effective from academic session 2019-20 onwards.

Encl: Copy of Option Form for maximum "D" grade

Deputy Registrar (Academic)

Copy to:

1. All HoDs
2. All the Hostels through Chief Warden (Boys & Girls)
3. Prof. I/C (CCN) for uploading on institute website under notification academic
4. Prof. I/C (Examinations)
5. Dean (Academic)
6. Dean (Student's Welfare)
7. SS to Registrar for kind information to the Registrar
8. SS to Director for kind information to the Hon'ble Director

NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA-136119

Agenda	:	21st Meeting of the Senate
Venue	:	Senate Hall, NIT, Kurukshetra
Date & Time	:	23rd February, 2013 at 11.00 a.m.

Item No.	Agenda Item	Pages
21.1	To confirm the minutes of the 20th meeting of the Senate held on 10.05.2012	1-9
21.2	To note the action taken on the minutes of the 19th and 20th meetings of the Senate held on 28.02.2012 & 10.05.2012 respectively	10-14
21.3	To note decisions taken in 41st and 42nd meeting of Standing Committee on Senate Affairs (SCSA)	15-18
21.4	To note the approval of the Chairman, Senate to the procedures for assigning (i) roll nos. to the students and (ii) course nos. to various subjects offered in UG/PG/Ph.D programs.	19-24
21.5	To note approval of the Chairman, Senate to Scheme and Syllabi of various M.Tech. programs	25-241
21.6	To note the approval of the Chairman, Senate to the revised scheme & syllabi of B.Tech courses and the courses offered to Ph.D students by Departments of Physics, Chemistry and Mathematics	242-297
21.7	To consider and approve the proposal of Mechanical Engg. Deptt. for change of name from B.Tech (Industrial Engg. & Management) to B.Tech (Production and Industrial Engg).	298-300
21.8	To consider and approve the scheme and syllabi of B.Tech (Production & Industrial Engg).	301-413
21.9	To consider the request of B.Tech./M.Tech./MBA/MCA students for awarding final degree with Honours.	414-415
21.10	Approval to the list of students to be awarded degrees in 10th Convocation	416-455

e 21.3

NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA-136119

No. Acad./2012/42nd SCSA/ Dated:31.01.2013

Minutes of the 42nd SCSA meeting held on 11 January, 2013 at 11:00 a.m. in the Board Room of the Institute

The following were present:-

1. Prof. Anand Mohan, Director — In Chair
2. Dr. V.K. Arora, Dean (P&D)
3. Dr. VK Sehgal, Dean (Faculty Welfare)
4. Dr. S.K Sharma, Dean (Students' Welfare)
5. Prof. A.K. Gupta, Dena (Academic)
6. Dr. A Swarup, Dean (Research & Consultancy)
7. Dr. K.K. Singh, Dean (Estate & Con.)
8. Dr. Brahmjit Singh, Professor, ECE
9. Dr. N.K. Gupta, Professo, CED
10. Dr. D.K. Soni, Head, CED
11. Dr. Sudhir Kumar, Head, MED
12. Dr. P.J. Philip, Head, HuSS & MBA Deptt.
13. Dr. (Ms.) Lillie Dewan, Head, EED
14. Dr. J.K. Quamara, Head, Physics Deptt
15. Dr. S.M. Gupta, Controller of Exam.
16. Dr. O.P. Sahu, Head, ECE Deptt.
17. Dr. L.M. Saini, Professor, I/C Acad. Affairs & Senate
18. Dr. S.K. Jain., Acting Head, Computer Engg. Deptt.
19. Dr. Paras Ram, Head, Mathematics Deptt.
20. Sh. S.K. Sharma, Acting Registrar I/C & Secretary, SCSA

The following decisions were taken:-

Item 42.1:
To consider and approve academic calendar for even semester of 2012-13:

The Academic Calendar for even semester 2012-13 was considered and approved as given in Annexure-I.

Item 42.2:
To consider and approve syllabi of second semester M.Tech. (Electrical Engg.):

The revised syllabi for M.Tech (Electrical Engg.) courses for even semester, was considered and approved as given in Annexure-II.

Item 42.3:
To consider and approve scheme and syllabi of II-IV semester M.Tech. (Renewable Energy Systems):

The Scheme and Syllabi of M.Tech (Renewable Energy Systems) for 2nd to 4th Semester was considered and approved as given in Annexure-III.

Item 42.4:
To consider and approve the modifications in the scheme of B. Tech. (ECE):

The proposed modified Scheme of B.Tech ECE programme as given in Annexure-IV was considered and approved

Any other item:

1 Representation of students on detention due to shortfall in attendance:

Dean (Academic) apprised the house regarding a representation received from the students detained in various subjects due to shortfall in attendance. The matter was discussed in detail and the following decisions were taken by the house.

(i) The detained students may be allowed to re-appear in the sessional and End semester examination The maximum grade awarded to the student in such a case in the concerned subject shall be 'D' grade.

Alternatively

(ii) In case the student is willing to get the higher grade in the subject (in which he/she is detained), the student may repeat the subject in the corresponding semester and may be awarded grade following the normal procedure.

The student may be given an option to choose one of the above.

2. Attendance benefit to students on medical ground:

It was decided that in case the student gets medical treatment from the health centre of the Institute (NIT, Kurukshetra), then attendance benefit shall be given by the coordinating teacher of the concerned subject on the basis of medical certificate given by SMO of the Institute health centre. In case the student gets medical treatment from a place other than the Institute health centre, then the attendance benefit shall be given by the coordinating teacher of the concerned subject on the basis of medical certificate given/endorsed by the CMO of the district concerned.

3. Framing the syllabi for multi disciplinary course in M.Tech. programmers:

It was observed that some courses of various M.Tech. programmes such as "Mechatronics", "Robotics", "Intelligent Control", "Bioconversion & Processing of Waste" etc. are multi disciplinary in nature. It was decided that such courses may be identified by the departments offering the concerned M.Tech. programme and arrange to conduct a joint meeting of BOS of all the concerned departments to frame the syllabi of such courses. Such courses may also be taught jointly by the concerned departments

The meeting ended with a vote of thanks to the Chair

Registrar I/C & Secretary, SCSA

Director & Chairman
Senate & SCSA

Seen
Prof I/c Acad & Senate Affairs

No. HD/19/335
dt 13.08.19

To

~~Dean~~ Academic Wing 16.8.2019
NIT Kurukshetra

DR(Acad)

Date → 13 August, 2019

Subject → Application for D grade

Respected Sir,

I am a 4th year civil engineering student of NIT Kurukshetra. I meet with an accident on 4th Augus 2018 due to which I was not able to attend 5th semester so I want to give the exams of 5th semester in 7th semester accepting D grade.

My CGPA till 4th semester was 8.6 and I got 9.05 in 6th semester.

So please allow me to give the exams (internal and exter of 5th semes in 7th semester.

Yours Sincerely
Himanshu Chauhan
(11610019)

S 36.12 **To note the approval of Chairman, Senate for minor changes in scheme & syllabi of Elect. Engg. & ECE Deptt. and consider some changes in the status of load for two subjects in Production & Industrial Engg.**

The Chairman, Senate has approved the minor changes in the new B.Tech scheme/syllabi of Electrical Engg. and Electronics & Comm. Engg. Deptt. which is placed as Annexure S 36.12 from page 62 to 90. As per letter received from HoD, Mech. Engg Deptt., there are some changes in the status of load for two subjects in B.Tech (Production & Industrial Engg.) as per recommendations of Board of Studies meeting held on 9.9.2019. The details are as follow:

Existing

Code	Course	L	T	P/D	Credits
PRPC-19	Machine Drawing	3	1	0	4
PRPE-21	Heat Transfer	2	0	2	3

Proposed

Code	Course	L	T	P/D	Credits
PRPC-19	Machine Drawing	1	0	6	4
PRPE-21	Heat Transfer	3	0	0	3

The Senate may note the approval of Electrical and ECE departments and consider the changes in status of load for two subjects of Production & Industrial Engineering.

N/1

Annexure S 36.12
Dated: 7.8.2019

CP-1 PUC is letter from HoD, Elect. Engg. regarding minor changes in the new B.Tech. scheme/syllabus discussed and recommended by DAC of Elect. Engg. Deptt. which was held on 6.5.2019. New syllabus CP-2 with minor changes is submitted for your kind approval.
Submitted for consideration and approval please.

8.8.2019
Dean (Academic)

Registrar Office
Dairy No. 2999
Dt. 8-8-19

Registrar Incharge 8/8/19

Director/Chairman, Senate 8/8/19

8/8/19
Dean (Acad)

Inform the HOD(EE) & to be placed in next Senate meeting
9.8.2019
DR(Acad)

Course Code	:	EEIR 11
Course Title	:	Familiarization to Electrical Engineering
Number of Credits		02-0-0=02
Course Type	:	EIR

Course Learning Objectives

- To provide basic knowledge of the different elements of electrical engineering field.
- To understand basic concepts of electrical engineering.

Course Contents

UNIT-I

Basic Circuits & Measurements:

Basics of circuit theory, phasor representation of signals, properties of signal, Series and parallel circuit analysis with resonance, Three-phase systems, analysis of three phase circuits and their properties, Two wattmeter method. Magnetic circuits and their properties.

UNIT-II

Electrical Machines:

Principle and working of transformers, equivalent circuit, open circuit and short circuits tests, losses and efficiency. Principle and working of DC motors, DC generators, and induction motors (three phase and single phase), Basic analysis of these motors and generators, Characteristic curves, speed control of dc shunt motor, application of dc generators and motors.

References:

1. V. Del Toro, "Principles of Electrical engineering", PHI.
2. E. Huges, "Electrical Technology", ELBS.
3. A. E. Fitzerald, D. E. Higginbotham and A. Grabel, "Basic Electrical Engineering", MGH.
4. PS Bhimbra.Power Electronics, Khanna Publishers.
5. Klemens Heumann, Basic Principles of Power Electronics, Springer-Verlag Berlin Heidelberg.
6. Nagrath and Gopal, Control System Engg, TMH.
7. IJ Nagrath and DP Kothari,"Power System Engineering" Tata McGraw-Hill.

Course outcomes

Students who successfully complete the course will be able to:

- Understand basic principle and operation of electric circuits and machines.
- Solve basic problems related to electrical circuits and machines.
- Explain the operation of different electrical technologies.
- Demonstrate an understanding of the control systems.

Course Code	:	EEPC 10
Course Title	:	Electrical Circuits and Networks
Number of Credits	:	3-1-0=4
Course Type	:	PC

Course Learning Objectives

- Understand about the network elements, network theorems
- Understand the fundamentals of non-linear circuits, transient response, and resonance concept.
- Gain knowledge about the two-port networks.
- Gain knowledge about synthesis of RL, RC & RLC networks

Course Contents

UNIT-I

Classification of circuits, sources and signals, source transformations, Network topology, graph matrices, formulation and solution of circuit equations based on graph theory using different analysis techniques- circuit, cut set and mixed. Concept of duality, Network theorems and their applications- Superposition, reciprocity, Thevenin, Norton, Maximum power transfer, Millman, Substitution, Compensation and Tellegan's theorem.

UNIT-II

Analysis of circuits with dependent sources, Time constants and Transient response under d.c. and a.c. excitation. Analysis of magnetically coupled circuits, Series and parallel resonance circuits, bandwidth and Q-factor, response with variation in parameters and frequency, introduction to non-linear circuits and their analysis.

UNIT-III

Concept of one port, two-port networks, characteristics and parameters, interrelationships of parameters, image & iterative impedance, concept of characteristic impedance, insertion loss.

UNIT-IV

Interconnection of 2-port networks, analysis of ladder, lattice, T and Bridge-T networks, standard test signals, S-domain analysis of electrical circuits.

References:

1. Circuit Theory (Network Analysis and Synthesis), A Chakrabarthy, Dhanpat Rai Publications.
2. Networks and System- D.Roy Choudhary, New Age International Publishers.
3. Circuit and Networks Analysis and Synthesis, A Sudhakar, Tata McGraw Hill Companies.
4. Vanvalkenburg. M.E, "Network Analysis", PHI, 3rd Edition, 2014.

Course outcomes

At the end of the course student will be able to

- Understand the fundamental of network theorems.
- Apply the knowledge of network analysis in technical problem solving
- Understand the impact of network synthesis and can apply in various engineering problem

Course Code	:	EEPC12
Course Title	:	Measurement and instrumentation
Number of Credits	:	3-0-0=3
Course Type	:	PC

Course Learning Objectives:

- To develop an understanding of the fundamentals of measurements.
- To be able to make measurement of voltage, current phase and frequency by analog and Digital techniques.
- To know about the function of construction and synchronization of C.R.O.
- To make studies about the various transducers

Course Contents

UNIT-I

Error analysis, Concepts and introduction to analog measurement of voltage, current, energy, phase and frequency, CRO.

UNIT-II

Measurement of low, medium and high resistances, Concept of AC bridges for measurement of inductance and capacitance, Instrument transformers; Current transformer and potential transformer, their performance characteristics.

UNIT-III

Digital Instruments, Analog to digital (A/D) and digital to analog (D/A) conversion, digital voltmeter and ammeter, digital energy meter, and digital wattmeter.

UNIT-IV

LVDT, transducers for measurement of position, force.

References:

1. AK Sawhney, "Electrical and Electronic Measurements & Instrumentation", Dhanpat Rai, Delhi.
2. C.T. Baldwin, "Fundamentals of Electrical Measurement", Lyall Book Depot.
3. E.W. Golding, "Electrical Measurement".
4. W.D. Cooper- "Electronics Instrumentation and Measurement Techniques", Prentice Hall India.
5. B.C. Nakra and K.K. Chaudhry- "Instrumentation Measurement and Analysis", Tata Mc-Graw- Hill Publishing Company Limited, New Delhi.

Course outcomes:

On successful completion of this course students will able to

- Measure voltages and current.
- Know the properties of digital instruments.
- Measurement with C.R.O and its synchronization.
- Measurement of phase and frequency.
- Transducers and its applications
- Knowledge of data acquisition system.

Course Code	:	EEPC 14
Course Title	:	Signals and Systems
Number of Credits	:	3-0-0=3
Course Type	:	PC

Course Learning Objectives

- To study properties and representation of various continuous and discrete-time signals.
- To acquire knowledge of time-domain analysis in terms of difference equations, impulse response and convolution etc.
- To acquire knowledge of frequency-domain analysis using Fourier series, Fourier, Laplace and Z transforms.
- To gain insight into the concepts of sampling process.
- To study different types of systems, their properties and modeling.

Course Contents

UNIT-I

SIGNALS AND SYSTEMS:

Introduction, Continuous and discrete time signals: periodic-aperiodic, even-odd, complex exponential-sinusoidal, deterministic-stochastic, energy-power, impulse-step, transformation of independent variable.

Continuous and discrete time systems: introduction, interconnection, basic properties- memory-memoryless, invertibility, causality, stability, time invariance, linearity.

UNIT-II

LTI SYSTEMS:

Introduction, Continuous and discrete time LTI systems: representation in terms of impulses, unit impulse, step and complex exponential response using convolution integral/sum, Properties of LTI systems, Modeling of continuous and discrete time LTI systems.

UNIT-III

FOURIER SERIES AND TRANSFORM:

Introduction, Fourier series: representation of continuous and discrete time periodic signals, convergence, properties, Application to LTI systems, Fourier transform: introduction, representation of continuous and discrete time aperiodic and periodic signals, convergence, properties, Application to LTI systems.

SAMPLING:

Introduction, sampling of continuous time signals; sampling theorem, reconstruction, effect of undersampling.

UNIT-IV

LAPLACE TRANSFORM:

Introduction, Laplace transform and its inverse, region of convergence, relation with Fourier transform, properties, Application to LTI systems, their interconnections and block diagram.

Z TRANSFORM:

Introduction, z-transform and its inverse, region of convergence, relation with Fourier transform, properties, Application to LTI systems, their interconnections and block diagram.

References

1. Alan V. Oppenheim, S. Hamid and Alan S. Willsky, Signals and Systems, PHI/Pearson.
2. M. J. Roberts, Signals and Systems, TMH
3. A. Papoulis, Circuits and Systems: A Modern Approach, Oxford Univ. Press
4. R.F. Ziemer, W.H. Tranter and D.R. Fannin, Signals and Systems: Continuous and
5. Discrete, Pearson
6. Simon Haykins and Barry Van Veen, Signals and Systems, Wiley
7. Fred J. Taylor, Principles of Signals and Systems, TMH

Course Outcomes

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

1. Characterize and analyze the properties of CT and DT signals and systems
2. Analyze CT and DT systems in Time domain using convolution
3. Represent CT and DT systems in the Frequency domain using Fourier analysis tools like CTFS, CTFT, DTFS and DTFT.
4. Conceptualize the effects of sampling a CT signal
5. Analyze CT and DT systems using Laplace transforms and Z Transforms.
6. Modeling different systems with detailed analysis of LTI systems.

Course Code	:	EEPC21
Course Title	:	Control Systems - I
Number of Credits	:	3-1-0=04
Course Type	:	PC

Course Learning Objectives:

- To study the fundamental concepts of control system problems and their solution possibilities,
- To study about the mathematical modelling of the various physical systems,
- To study the concept of time-domain response (transient and steady-state response) and frequency-domain analysis of the systems,
- To study the basics of stability analysis of the systems,
- To study about the specifications of controller and compensator design and its implementations.

Course Contents:

UNIT-I

MOTIVATION, MODELS AND PHYSICAL SYSTEMS

Introduction to Control System: The control problem and solution possibilities, the notion objectives/ specifications, feedback as natural strategy, regulation, set-point and tracking problems, concept of stability.

Transfer Function: Definition, examples with mechanical, electrical, hydraulic, pneumatic systems and systems with dead zone.

Description of Control System Components: Error detectors, gears, gyroscope, DC motors, servomotors, techo-generators, servo amplifiers, synchros; block diagram and reduction techniques, signal flow graphs, mason's gain formulae, performance of feedback Systems.

UNIT-II

TIME-DOMAIN ANALYSIS

Transient Response Analysis: Transient and steady-state response analysis for first and second order systems and their qualitative analysis; impact of close looping on system parameters and their sensitivity, error analysis and error constants.

Root Locus Analysis: Development of root loci, root motions under close-looping, effects of pole/zero on loci, effect of rate and reset times, stability, relative stability and time-domain specification using root locus.

UNIT-III

FREQUENCY-DOMAIN ANALYSIS

Stability Analysis: Routh's array analysis; Routh-Hurwitz stability criterion, relative stability and frequency-domain specifications analysis using Bode plots, Nichols plot, Polar plots, Nyquist plot; M and N circles.

UNIT-IV

CONTROLLER/ COMPENSATOR DESIGN

Controller Design: Specifications of time-domain and frequency domain and interrelation between them; design of P, PD, PI, PID error control strategies; impact on transient response and steady-state response.

Compensator Design: Lead, lag and lag-lead compensation, compensator design using root locus and frequency response methods; role of gains; role of phase.

References:

1. D' Azzo and Houpis, Linear Control Systems Analysis and Design, McGrow Hill, Edition No. 05, 2003.
2. Katsuhiko Ogata, Modern Control Engineering, Pearson Education, Edition No. 05, 2010.
3. M. Gopal, Control Systems Principles and Design, Tata McGrow Hill, Edition No. 04, 2010.
4. N. S. Nise, Control Systems Engineering , Wiley, Edition No. 07, 2015.
5. Dorf and Bishop, Modern Control Systems, Addison Wesley,Edition No. 13, 2017
6. Nagrath& Gopal, Modern Control Engineering, New Ages International, Edition No 05, 2010.
7. Raymond T. Stephani, Design of Feedback Control Systems, Oxford University Press, Edition No. 04, 2002.

Course Outcomes:

At the end of the course student will have

- Fundamental knowledge of control system, mathematical modelling of various physical systems,
- Determine the response of first and second order systems for various inputs,
- Analyze the transient and steady-state response open-loop and closed-loop systems,
- Analyze the stability of the in time-domain as well as in frequency-domain,
- Design and implementation of P, PD, PI, PID controllers and lead, lag and lag-lead compensators.

Course Code	:	EEPC 23
Course Title	:	Electrical Machines-I
Number of Credits	:	3-1-0=4
Course Type	:	PC

Course Learning Objectives:

- Understanding basic principles of energy conversion in electromechanical systems, construction and operation of dc machines in motoring and generating modes.
- Comprehend the magnetizing characteristics and operation of single phase as well as the three-phase transformers.

Course Contents:

Electromagnetic Energy Conversion

Production of force and torque in Electrical Machine.

Single Phase Transformer

Transformer construction, Ideal and practical trans former, exact and approximate equivalent circuits, no load and on load operation, phasor diagrams, power and energy efficiency, voltage regulation, parallel operation, effect of load on power factor, Per Unit system, excitation phenomenon in transformers, Auto transformers.

UNIT-II

Three Phase Transformers

Constructional features of three phase transformers, Cooling methodology, Standard and special transformer connections, Phase conversion, three winding transformers and its equivalent circuit.

UNIT-III

DC Generators

Construction of armature and field systems, Working, types, emf equation, self- excitation build up, Armature windings, Characteristics and applications, Armature reaction - Demagnetizing and Cross magnetizing mmfs and their estimation; Remedies to overcome the armature reaction; Commutation process, Causes of bad commutation and remedies.

UNIT-IV

D.C. Motors:

Principles of working, Significance of back emf, Torque Equation, Types and Characteristics of DC Motors, Starting of DC Motors, Speed Control, Losses and Efficiency, Braking of DC Motors, Effect of saturation and armature reaction on losses; Applications.

References:

1. A.E. Fitzgerald and Charles Kingsley, 'Electric Machinery', Tata McGraw-Hill Education Publications.
2. Vincent Del Toro, 'Electrical Engineering Fundamentals', 2nd Edition, Prentice Hall Publications.
3. P.S. Bhimbra, 'Electrical Machinery', Khanna Publications.
4. Nagrath, I.J. and Kothari, D.P., 'Electrical Machines', Tata McGraw-Hill Education Private Limited Publishing Company Ltd.

Course outcomes:

Upon the completion of the course, the student will be able to

1. Understand the constructional details and principle of operation of DC machines and transformers.
2. Analyze the performance of the DC Machines under various operating conditions using their various characteristics.
3. Evaluate the performance of Transformers using phasor diagrams and equivalent circuits.
4. Select appropriate DC motor as well as to choose an appropriate method of speed control for any industrial application.

Course Code	:	EEPC25
Course Title	:	Electronics Devices and Circuits
Number of Credits		3-1-0=4
Course Type	:	PC

Course Learning Objectives

To prepare students to perform the analysis and design of various analog and digital electronic circuits.

Course Content

UNIT-I

Transistor biasing circuits: Base bias, Emitter-feedback bias, collector-feedback bias, Voltage-divider bias, emitter bias. CE, CC and CB analysis. JFET: Gate bias, Self bias, Voltage-divider bias and source bias, current source bias. MOSFET: Depletion type, Enhancement type MOSFET and their biasing., Power Amplifiers: Class A, B, C, D and S power amplifiers. Push-pull operation.

UNIT-II

OP-AMP: Differential amplifier and its DC, AC analysis, OP-AMP characteristics, Non-Inverting/Inverting Voltage and Current feedback. Linear and Non-Linear OP-AMP circuits, Regulated power supplies. Oscillators- Barkhausen criteria of oscillations, Wein-bridge, RC oscillator, 555 timer: its monostable and astable operation.

UNIT-III

Logic gates and Combinational Circuits: Logic gates, Universal gates, transistor as a switching element, Tri-state switch, Introduction to combinational circuits, arithmetic and logical operation, design of Half adder & full adder, subtractor circuits, decoders, multiplexers, demultiplexers, comparators.

UNIT-IV

Sequential Circuits: Flip-flops, bistable circuits: RS, JK, D, T, Master/Slave Flip-flop, race around condition, latches, synchronous and asynchronous counters up & down counters, shift registers.

References:

1. Millman and Halkias, "Integrated Electronics", Mc Graw Hill.
2. R. Boylested and L. Nashelsky, "Electronics Devices and Circuits", Prentice Hall India.
3. Millman and Halkias, "Electronics Devices and Circuits", TMH Edition.
4. Malcolm Goodge, "Analog Electronics Analysis and Synthesis", TMH Edition.
5. Malvino, "Electronics Principles", TMH Edition
6. AP Malvino and DP Leach, ' Digital Principles and applications'
7. Charles Roth, 'Fundamentals of Logic Design'.
8. H. Taub and D. Schilling, 'Digital Integrated Electronics'.

Course outcomes

- To understand the concept of multistage amplifiers, analysis of multistage amplifier and its frequency response, Darlington pair and bootstrap circuits.
- To learn the basics of tuned amplifiers such as single tuned, double tuned, stagger tuned & power amplifiers.

- To study and analyze the performance of negative as well as positive feedback circuits.
- To study and analyze the wave shaping circuits and operational amplifies.
- Acquired knowledge about basics of digital electronics.
- Ability to identify, analyze and design combinational circuits.
- Ability to design various synchronous and asynchronous sequential circuits.
- Acquire knowledge about internal circuitry and logic behind any digital system.

Course Code	:	EEPC27
Course Title	:	Power Engineering-I
Number of Credits	:	3-1-0=4
Course Type	:	PC

Course Learning Objectives

- To understand the working of different types of power generation systems
- To realize the necessity for interconnected operation of different power stations.
- Identify major components of power transmission and distribution systems.
- Describe the principle of operation of transmission and distribution equipment.
- Know and appreciate the key factors in equipment specification and network design.

Course Contents

Unit - 1

Introduction to Power Engineering: Basic Structure of Power System, Historical developments of Electric Power System, Need for regulation of early power utilities, Motivation for deregulation: potential problems and key issues, Growth of transmission and distribution network in India.

Unit - 2

Transmission line parameters – types of conductors, line resistance, skin effect and proximity effect, inductance and capacitance calculation of single-phase lines, three phase lines: symmetrical and unsymmetrical, bundle conductor lines and double circuit lines. Performance of transmission lines – Modelling of short, medium and long lines, ABCD Parameters, Ferranti Effect, Regulation and Efficiency calculation, Power flow through transmission line, Reactive Power compensation.

Unit – 3

Mechanical design of OH Lines – Types of line support, Sag and Tension calculation, factors affecting sag, wind and ice loading, sag template and conductor vibrations.

OH Line Insulators – types of insulators, Voltage distribution in suspension insulators, string efficiency calculation and improvement. Phenomenon of Corona, disruptive critical voltages, factors affecting corona losses.

Unit – 4

Underground Cables – Structure of UG cable, types of cables, grading of cables, capacitance calculation, current rating. Basics of distribution system, load characteristics, power factor improvement and types of tariff.References

1. D. P. Kothari and IJ Nagrath, 'Power System Engineering', Tata Mcgraw – Hill, 2nd Edition, 2008.
2. Singh S N, 'Electric Power Generation Transmission and distribution', PHI India, 2nd Edition,2008
3. Chakrabarti A., Soni M.L., Gupta P.V., and Bhatnagar U.S., 'A Text Book on Power Systems Engg', Dhanpat Rai and Sons, New Delhi, 2nd Revised Edition, 2010.
4. B.R.Gupta, 'Generation of Electrical Energy', S. Chand Limited, 2009.
5. Wadhwa, C.L., 'Generation Distribution and Utilisation of Electrical Energy', New Age International Publishers, 3rd Edition, 2010.
6. Mohammad Shahidehpour, Hatim Yamin, 'Market Operations in Electric Power Systems', John Wiley & Sons Inc., 2002.

Course Outcomes:

Upon completion of this course, students will be able to

- Understand the major components of Transmission and Distribution Systems (TDS) and its practical significance
- Good Knowledge of various equipment specifications and design for TDS
- Awareness of latest technologies in the field of electrical transmission and distribution.
- Appreciate the different types of tariff, consumers and different types of power generation plants.
- Determine the significance of various components of the power generation plants.
- Correlate the importance of interconnected operation of different power generation systems.
- Plan an appropriate scheduling of electric power to satisfy the demand constraint

Course Code	:	EEPC29
Course Title	:	Power Electronics-I
Number of Credits		3-1-0=4
Course Type	:	PC

Course Learning Objectives

- To understand about various power semiconductor devices.
- To analyze and design different power converter circuits.

Course Contents:

UNIT-I

Power Electronics Devices:

Principle of operation of SCR, dynamic characteristic of SCR during turn ON and turn OFF, Two-transistor analogy, Protection of SCR, Snubber circuit, Commutation circuits, SCR ratings, Triggering Methods, Series and Parallel operation of SCR. Principle of operation of, Power MOSFET, IGBT, GTO, MCT, DIAC, TRIAC, IGCT, their operating characteristics.

UNIT-II

Single-phase Converter:

Half wave converter, 2-pulse midpoint converter, half controlled and fully controlled bridge converters, input current and output voltage waveforms, effect of load and source impedance, expressions for input power factor, displacement factor, harmonic factor and output voltage, effect of free-wheeling diode, triggering circuits, Dual converter.

UNIT-III

Three-phase Converter:

Half wave, full wave, half controlled and fully controlled bridge converters, effect of load and source impedance, expressions for input power factor, displacement factor, harmonic factor and output voltage, Dual Converter.

UNIT-IV

A.C. Converters:

Principle of operation of single-phase ac regulator, effect of load inductance, firing pulse requirement. Principle of operation of cyclo-converter, waveforms, control technique;

References:

1. M. Ramamoorthy. Thyristor and their applications, East West Publication, 1991.
2. PS Bhimbra.Power Electronics, Khanna Publishers, 2015.
3. MD Singh and KB Khanchandani, Power Electronics, TMH Edition, 2007.
4. AK Gupta and LP Singh, Power Electronics, Dhanpat Rai Publishing Co.
5. G.K. Dubey, S. R. Doradla, A. Joshi, and R. M. K. Sinha, "Thyristorised Power Controllers", New Age International Private Ltd.
6. Mohan N., Undeland T. M. and Robbins W. P., "Power ElectronicsConverters, Applications and Design", 3rd ED, Wiley India.

Course outcomes

- Understand fundamental concepts in power electronics.
- Capability to analyze power converter circuits
- Identify basic requirements for power electronics based design and application.
- To troubleshoot power electronics circuits.

Course Code	:	EEPC211
Course Title	:	Network Synthesis and Filters
Number of Credits	:	3-1-0=4
Course Type	:	PC

Course Learning Objectives:

The course is aimed at imparting talent into the student for transforming mathematical equations into physical electrical networks, impart fundamentals of the magnitude and phase considerations of electrical circuits followed by the design of electric filters to achieve desired magnitude and phase over pre-specified band of frequencies. The learner will learn the behavior of impedance matching and phase shifting networks.

Course Contents

UNIT-I

Fundamental Concepts: Energy considerations, positive real condition, Hurwitz polynomials, Bounded realness, scattering description of networks.

UNIT-II

Lossless one port network functions, Foster reactance functions and theorem, canonical forms: Cauer's and Foster's, Synthesis of lossless LC Immitance functions, Synthesis of lossy RL and RC functions, Certain RLC function realizations. Fundamentals of two port network synthesis.

UNIT-III

Passive Filter Design: Analysis and Design of Constant K and m-derived filters,

Active Filter Design: Amplitude and phase functions, amplitude approximations, phase approximations, simultaneous amplitude and phase approximations.

UNIT-IV

Maximally flat and Equi-ripple filters, Magnitude and frequency normalizations, frequency transformations; High Pass, Band-Pass, Band-stop filters.

References:

1. H. Baher, "Synthesis of Electrical Networks", John Wiley & Sons, 1984.
2. Franklin Kuo, "Network Analysis and Synthesis", Second Edition, Wiley, 2009.
3. Steve Winder, "Analog and Digital Filter Design",Newnes, Elsevier Science, 2002.

Course Outcomes

The students shall be able to

- Transform the mathematical driving point or transfer relations into realizable electrical circuits.
- Think and design analog electric filters.

Course Code	:	EEPC24
Course Title	:	Power Engineering-II
Number of Credits	:	3-1-0=4
Course Type	:	PC

Course Learning Objectives:

To give a broad coverage on all types of protective relays, circuit breakers and provide a strong background for working in a practical power system protection system.

Course Contents

UNIT I

Introduction, arcing in circuit breakers, arc interruption theories, re-striking and recovery voltage, resistance switching, current chopping, interruption of capacitive current, oil circuit breaker, air blast circuit breakers, SF6 circuit breaker, vacuum CBs, operating mechanism, selection of circuit breakers, high voltage d.c. breakers, ratings of circuit breakers, testing of circuit breakers.

UNIT II

Relays – General classification, Principle of operation, types, characteristics, Torque equation, Relaying Schemes, Relay Co- ordination.
Apparatus and line protection – Line Protection – Distance, Differential protection and Carrier current protection. Generator protection – protection against abnormal condition, stator and Rotor protection.
Transformer Protection – Incipient fault – Differential protection,
Feeder and Bus bar protection.

UNIT III

Protection against over voltages – Causes of over voltage Ground wires, Surge absorbers and Diverters, Earthling – types, Insulation coordination.

UNIT IV

Static relays – Digital relays - Microprocessor based relays – Apparatus and line protection – Basics of Numerical relays.

References:

1. Badri Ram and Vishwakarma, D.N., 'Power System Protection and Switchgear', Tata- McGraw Hill publishing company Ltd., 2nd Edition, 2011.
2. Ravindranath B., and Chander, N., 'Power Systems Protection and Switch Gear', Wiley Eastern Ltd., 1st Edition, 1977.
3. Sunil S.Rao, 'Protective Switch Gear', Khanna Publishers, New Delhi, 13th Edition, 2008.
4. Y. G. Paithangar, 'Fundamentals of power system protection', PHI Learning Private Limited, 2nd Edition, 2010.

Course Outcomes

Upon completion of the course the students would be able to

- Classify and describe the working of various relaying schemes.
- Identify and implement an appropriate relaying schemes for different power apparatus.
- Illustrate the function of various CBs and related switching issues.
- Describe the causes of overvoltage and protection against overvoltage.

Course Code	:	EEPC26
Course Title	:	Electrical Machines-II
Number of Credits	:	3-1-0=4
Course Type	:	PC

Course Learning Objectives:

The objective of the course is to impart knowledge of the constructional features and principle of operation of different types of induction and synchronous machines. The course also deals with the methods of starting and speed control of induction motors.

Course Contents:

UNIT-I

Basic Concepts in A.C. Machines: Classification of A.C. Machines, rotating mmf waves in A.C. Machines. Introduction of ac machine windings, winding factors, the emf equation,

UNIT-II

Synchronous Machines: Construction, types, armature reaction, circuit model of synchronous machine, determination of synchronous reactance, phasor diagram, power angle characteristics, parallel operation of synchronous generators, synchronizing to infinite bus bars, synchronous motor operation, characteristic curves, synchronous condenser.

UNIT-III

Three phase Induction (Asynchronous) Motors: Types of induction motor, flux and mmf waves, development of circuit model, power across air gap, torque and power output, oc and sc tests, starting methods, cogging and crawling, speed control, deep bar/ double cage rotor.

UNIT-IV

Single Phase Induction Motors: Introduction, single phase induction motors, double revolving field theory, circuit model of single phase induction motor, determination of circuit parameters

References:

1. Arthur Eugene Fitzgerald and Charles Kingsley, 'Electric Machinery', Tata McGraw Hill Education Publications
2. Miller, T.J.E., 'Brushless Permanent Magnet and Reluctance Motor Drives', Clarendon Press.
3. P.S. Bhimbra, 'Electrical Machinery', Khanna Publications.
4. Nagrath, I.J. and Kothari, D.P., 'Electrical Machines', Tata McGraw Hill Education Private Limited Publishing Company Ltd.
5. M. G. Say, 'Performance and Design of Alternating Current Machines', CBS Publishers & Distributors Pvt. Ltd., New Delhi.

Course outcomes:

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

- Understand the constructional details and principle of operation of AC Induction and Synchronous Machines.
- Analyze the performance of the AC Induction and Synchronous Machines using the phasor diagrams and equivalent circuits.
- Select appropriate AC machine for any application and appraise its significance.

Course Code	:	EEPC28
Course Title	:	Power Electronics-II
Number of Credits		3-1-0=4
Course Type	:	PC

Course Learning Objectives

- To understand about various power converters.
- To understand the applications of power converters.
- To analyze the requirements and control of power converters.

Course Content

UNIT-I

D.C. to D.C. Converter:

Classification of choppers. Principle of operation, steady state analysis of class A chopper, step up chopper, switching mode regulators: Buck, Boost, Buck-Boost, Cuk regulators. Current commutated and voltage commutated chopper.

UNIT-II

Isolated converters: Forward, Flyback, push-pull, half bridge, ZVS, ZCS, full bridge converters and control of SMPS.

UNIT-III

D.C. to A.C. Converter:

Classification, basic series and improved series inverter, parallel inverter, single phase voltage source inverter, steady state analysis, Half bridge and full bridge inverter: Modified Mc Murray and Modified Mc Murray Bedford inverter, voltage control in single phase inverters, PWM inverter, reduction of harmonics, current source inverter, three phase bridge inverter.

UNIT-IV

A.C. to A.C. Converter:

AC voltage regulators, configurations, performance analysis, harmonics, Cyclo-converters and their applications.

References:

1. Ned Mohan, "Power Electronics: Converters, Applications and Design", John-Wiley & Sons, 2003.
2. V. Subrahmanyam, " Electric Drives: Concepts and Applications", Tata Mc Graw Hill Publishing Co. Ltd., 1994.
3. GK Dubey, " Power semiconductor Controlled Drives, "Prentice Hall, Englewood cliffs, New Jersey, 1989.
4. EL- Sharkawi& A Mohamad " Fundamental of Electric Drive", Vikas Publishing House

Course outcomes

- Capability to analyze power converter circuits
- Model and analyze electrical motor drives.
- Choose suitable components for the electric drives.
- Choose a suitable control structure and calculate control parameters for an electrical motor drive

Course Code	EEPE22A
Course Title	Renewable Energy
Number of Credits	3-1-0=4
Course Type	PE

Course Learning Objectives

- To impart knowledge of the principles and working of various renewable energy resources.

Course Contents

Unit-I

Introduction:

Limitations of conventional energy sources, need and growth of alternate energy sources, basic schemes and applications of direct energy conversion. Basic principles of MHD generator and Hall Effect, different types of MHD generators, conversion effectiveness. Practical MHD generators, applications and economic aspects.

UNIT-II

Wind and Solar Energy:

Photovoltaic effect, characteristics of photovoltaic cells, conversion efficiency, solar batteries and applications. Solar energy in India, solar collectors, solar furnaces & applications.

History of wind power, wind generators, theory of wind power, characteristics of suitable wind power sites, scope in India, advantages and limitations.

UNIT-III

Thermo-electric Generators:

Seeback effect, peltier effect, Thomson effect, thermoelectric convertors, brief description of the construction of thermoelectric generators, applications and economic aspects.

UNIT-IV

Fuel Cells and Miscellaneous Sources:

Principle of action, Gibbs free energy, general description of fuel cells, types, construction, operational characteristics and applications. Geothermal system, characteristics of geothermal resources, Low head hydroplants.

References

1. R.A. Coormbe,. "An introduction to direct energy conversion".
2. M. Kettani, . "Direct energy conversion".
3. Robest L Loftness, "Energy hand book".
4. D. P. Kothari, K C Singal, Rakesh Ranjan, "Renewable Energy Sources and Emerging Technologies"
5. Shobnath Singh, "Non Conventional Energy Resources"
6. G D Rai, "Non Conventional Energy Sources"

Course outcomes

- Able to know basic concepts of renewable energy resources.
- Able to identify scope of renewable energy resources in India.

Course Code	:	EEPE22C
Course Title	:	Modelling and Simulation
Number of Credits	:	3-1-0=4
Course Type	:	PE

Course Learning Objectives

The aim of this course is two-fold;

- To introduce students the complexities of the real life problems and their solution with stochastic modeling and comprehensive simulations.
- To introduce learner the fundamental principles of simulation in both deterministic and stochastic frameworks.

Course Contents

UNIT-I

Review of Probability and Random Number generation. Generating continuous and discrete time random variables.

UNIT-II

Modeling of systems as discrete event systems (DES). Continuous time and discrete time Markov chains, Queuing models.

UNIT-III

Heuristic modeling, Neural, Fuzzy and Neuro-Fuzzy modeling and simulation of dynamic systems.

UNIT-IV

Dynamical system simulation, Monte Carlo simulations, generation of simulation data and its statistical analysis, Statistical validation techniques, Goodness of fit test - χ^2, and others, Agent based simulation,

References:

1. Sheldom Ross, "Simulation", Academic Press, Elsevier Imprint, 2006.
2. Sankar Sen Gupta. "System Simulation and Modeling", Pearson Education, 2013.
3. J. Banks, J. S. Carson, B. Nelson and D. M. Nicol, "Discrete Event system simulation", Pearson Education, 5th Edition, 2014.
4. J. R. Jang and C. Sun, "Neuro-Fuzzy Modeling and Control", Proceedings of IEEE, Vol. 83, No. 3, March 1995.

Course Outcome

Upon successful completion of the course, students will be able to

- Look engineering system from the point of view of stochastic framework
- Model various systems from multiple domains e.g. electrical engineering, bio-informatics, financial systems etc.
- Undertake further industrial and research assignments.

Course Code	EEPE24A
Course Title	Distribution System Analysis and Automation
Number of Credits	3-0-0=3
Course Type	PE

Course Learning Objectives

To understand concept of distribution system, layouts of substation and lines, consumer loads, application of distribution transformers, power flow analysis and basics concept of distribution system automation

Course Contents

UNIT-I

Distribution systems – General aspects – Kelvin's Law – A.C distribution – single phase and three phase – Underground cables – Comparison with overhead line – Types of cables – insulation resistance –potential gradient – capacitance of single core and three core cables, customer loads, feeders loads, load models, Layout of substations and feeders.

UNIT-II

Method of analysis: voltage drop calculations, K-factors, uniformly distributed loads, lumping loads in geometric configuration.

Series impedance and shunt admittance of overhead and underground lines: series impedance of OH lines, Carson's equation, modified Carson's equation, primitive and phase impedance matrix, impedance of under-ground lines, concentric and tape shielded cables, shunt admittance of overehead and Underground distribution lines.

UNIT-III

Application of distribution transformers and voltage regulation: Types, efficiency, single phase, three phase connections, step regulators for single and three phase.

Distribution feeder analysis: power flow analysis, ladder iterative technique, unbalanced three phase feeders, ladder technique for unbalanced feeders, capacitor placement.

UNIT-IV

Introduction to Distribution Automation System, control hierarchy, Distribution Automation concept, architecture, DA Capabilities, DATA acquisition and SCADA system.

References

1. Momoh A. Momoh, James A. Momoh., 'Electric Power Distribution, Automation, Protection, and Control', CRC Press, 2007.
2. Turan Gonen., 'Electric Power Distribution System Engineering', BSP Books, Pvt. Ltd, 2007.
3. William H. Kirsting, Distribution system modeling and Analysis, CRSC press, Taylor and Francis group, 2007.
4. Robert H.Miller, James H.Malinowski, 'Power System Operation', Tata McGraw-Hill, 2nd Edition, 2009.

Course Outcome

Upon completion of the course, the student will be able to

- Calculate various factors (such as load factor and demand factor, etc.) and interpret different tariff structures.
- Develop generation dispatching schemes for thermal units.
- Apply frequency control schemes on power system.
- Employ reactive power compensation systems.
- Adopt engineering innovations for improved power system operation.

Course Code	:	EEPE24B
Course Title	:	Power Plant Instrumentation
Number of Credits		3-0-0=3
Course Type	:	PE

Course Learning Objectives

- To familiarize the students with the basic concepts, different types, scope and applications of FACTS controllers in power transmission.

Course Contents

UNIT I: Introduction to Power Plant
Power plant terminologies and key terms, power plant classification: thermal, hydro, nuclear, co-generation, comparison of various power plants based on technology, usage, efficiency, and limitations. Role of Instrumentation and Control in Nuclear Power Plants.

UNIT II: Boiler Control System-I
Types of boilers, various control such as: combustion control, air to fuel ratio control, 3-element drum level control, steam temperature and pressure control, O_2/CO_2 in flue gases, furnace draft, boiler interlocks, sequence event recorder, supervisory control,

UNIT-III Boiler Control System-II
Data acquisition controls, burner management systems and controllers, Drum-Level and Feed-water Controls, start-up and shut-down procedures, boiler safety standards, boiler inspection procedures, Boiler load calculation, boiler efficiency calculation.

UNIT IV: Turbine Instrumentation
Turbine instrumentation and control, Generator Control System, Turbine Controls -Seal Steam Pressure Control System, start-up and shut-down, thermal stress control, turbine supervisory instrumentation, condition monitoring, generator, power distribution instrumentation.

Reference Books:

Manoj Kumar Gupta, —Power Plant Engineering||, PHI Learning Private Limited, 1st ed., 2012.
Swapan Basu and Ajay Debnath, Power Plant Instrumentation and Control Handbook: Theory and Practice, 1/e, Academic Press, Elsevier Publishers, 2014

Course outcomes

- Understanding of Instrumentation used in power plant.
- Ability to demonstrate the standards used in power plants.
- Understanding the impact of power plant operation in environmental and societal context.

Course Code	:	EEPE24C
Course Title	:	Power System Compensation
Number of Credits	:	3-0-0=3
Course Type	:	PE

Course Learning Objectives

- To familiarize the students with the basic concepts, different types, scope and applications of FACTS controllers in power transmission.

Course Contents

UNIT I

Fundamentals of ac power transmission, transmission problems and needs, emergence of FACTS devices, control considerations, FACTS controllers.

Principles of shunt compensation – Variable Impedance type & switching converter type-Static

UNIT II

Synchronous Compensator (STATCOM) configuration, characteristics and control.

Principles of static series compensation using GCSC, TCSC and TSSC, applications, Static Synchronous Series Compensator (SSSC).

UNIT III

Principles of operation-Steady state model and characteristics of a static voltage regulators and phase shifters-power circuit configurations.

UNIT IV

UPFC-Principles of operation and characteristics, independent active and reactive power flow control, comparison of UPFC with the controlled series compensators and phase shifters.

References:

1. Hingorani, L. Gyugyi, 'Concepts And Technology Of Flexible AC Transmission System', Standard Publishers Distributors, 1st Edition, 2011.
1. R.M. Mathur And R.K. Varma, 'Thyristor-Based FACTS Controllers For Electrical Transmission Systems', Wiley India Pvt. Limited Publications, 1st Edition, 2011.
2. 3 K. R. Padiyar, 'FACTS Controllers In Power Transmission And Distribution', New Age International Publications, 1st Edition, 2009.
3. Enrique Acha, Claudio R. Fuerte-Esquivel, Hugo Ambriz-Pérez, César Angeles-Camacho, 'FACTS: Modelling And Simulation In Power Networks', John Wiley & Sons, 2004.
4. 5 Enrique Acha, Vassilios Agelidis, Olimpo Anaya, T.J.E.Miller, 'Power Electronic Control In Electrical Systems', Newness Power Engineering Series, 2002.
5. 6 T.J.E.Miller, 'Reactive Power Control In Electric Systems', Wiley Publications, 1982.

Course Outcomes

Upon completion of the course, the students shall be able to

- Understand various Power flow control issues in transmission lines, for the purpose of identifying the scope and for selection of specific FACTS controllers.
- Apply the concepts in solving problems of simple power systems with FACTS controllers.
- Design simple FACTS controllers.

NATIONAL INSTITUTE OF TECHNOLOGY KURUKSHETRA
Diary No. 6302
Dated 7-8-19

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, KURUKSHETRA

No.ECE/19/1446 Date: 04.08.19

As per new curriculum of B.Tech.ECE,V semester ECE students are supposed to opt one open elective subject But other departments are not offering any open elective in V semester So ECE students have no option for open elective. Therefore, it is requested to kindly replace open elective of Vsemester as program elective.

This is submitted for kind approval.

05/08/2019
HOD, ECE

Dean(Acad) Dept may be allowed to run program electives in place of Open Elective bl.

6.8.2019

6/8/19

2870
6.8.19

6/8/19

Dean (Acad)

1. Ms Monika, to maintain the copy of this along with other permitted courses
2. HOD (ece) for use

Copy sent to HOD, ECE by email

8/8/19

ECE

Revised

Semester V

Code	Course	L	T	P	Credits
ECPC50	Information Theory and Coding	3	1	0	4
ECPC51	Antenna & Wave Propagation	3	1	0	4
ECPC52	Digital Signal Processing	3	1	0	4
ECPC53	Digital Communication	3	1	0	4
ECPExx	...	3	0	0	3
ECPExx	...	3	0	0	3
ECLR50	Digital Communication Lab	0	0	2	1
ECLR51	DSP Lab	0	0	2	1
ECLR52	Transmission Lines & Antenna Lab	0	0	3	1
	Total	18	4	7	25

A. (1) ECPE50 Data Structure (2) ECPE51Computer Networks
(3) ECPE52 Neuro-Fuzzy Systems

B. (1) ECPE53Analog and Mixed Signal Design (2) ECPE 54Embedded System Design

Open Electives (1) ECOE50 Electronics Engg. (2) ECOE51 Signal Analysis

Semester VI

Code	Course	L	T	P	Credits
ECIR60/61	Summer Internship/Project Work	0	0	20	10
	Total	0	0	20	10

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DEPARTMENT OF MECHANICAL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA

No. MED/BOS/19/ 2213 Dated: 09.09.2019

Minutes of Board of Studies Meeting held on 09.09.2019

Minutes of the meeting of Board of Studies (BOS) held on 09.09.2019 (Monday) at 3.15 PM. in the conference room of the department. The following members were present:

1.	Dr. Dinesh Khanduja	In Chair
2.	Dr. Surjit Angra	Member
3.	Dr. P.C.Tewari	"
4.	Dr. Hari Singh	"
5.	Dr. V.K. Bajpai	"
6.	Dr. Ajai Jain	"
7.	Dr. Vinod Kumar	"
8.	Dr. (Mrs.) Meenu	"
9.	Dr. P.K. Saini	"
10.	Dr. Sandeep Singhal	"
11.	Dr. Rajiv Verma	"
12.	Dr. Gulshan Sachdeva	"
13.	Dr. Jatinder Kumar	"
14.	Dr. Rajneesh	"

The Chairman, BOS welcomed the members. After detailed deliberations the following decisions were taken.

Proceedings & Decisions taken:-

1. It is recommended to change the status of load for PRPC-19 (Machine Drawing) in B.Tech 3rd Sem (Production & Industrial Engineering)

Existing

Code	Course	L	T	P/D	Credits
PRPC-19	Machine Drawing	3	1	0	4

Proposed

Code	Course	L	T	P/D	Credits
PRPC-19	Machine Drawing	1	0	6	4

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2. It is recommended to change the status of load for PRPE-21 (Heat Transfer) in B.Tech 5th Sem (Production & Industrial Engineering)

Existing

Code	Course	L	T	P	Credits
PRPE-21	Heat Transfer	2	0	2	3

Proposed

Code	Course	L	T	P	Credits
PRPE-21	Heat Transfer	3	0	0	3

9.9.19

Head of Department

Dean (Academic)