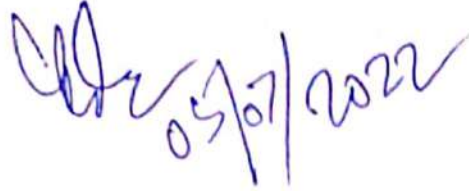


Summary of BOS 2019-20

Date	BOS 2019-20	Subject	Decision/ Remark
06-08-20	Mail Sent to Dr. G.K.Singh IIT Roorkee	Course Structure of Third Semester	Approve


05/07/2022


11/07/2022
J. K. Dharvedi
Asst. Electrical Engineering Department
School of Engineering
I.I.T. Kanpur-205002

Compos

Labels

- Inbox
- Sent
- Spam
- Trash
- Unread
- Starred
- Categories
- Account Team
- Missed
- New meeting
- Join a meeting
- Hangouts
- gk.singh
- Advo Hari Kishan, Unkn
- anurag singh Chauhan 8121777
- Alok, Vaishali, Deepak, Sre
- Gauri Anand 7421097
- Rajesh Pandey 90134
- Rajesh Kumar
- Alok Tripathi panadey kaha hai 9677

Fwd: Comments and Approval

Chhabendra Nath Singh
to me

----- Forwarded message -----
From: Head Electrical <noden@bttu.ac.in>
Date: Thu Aug 6, 2020 4:13 PM
Subject: Fwd: Comments and Approval
To: Chhabendra Singh <gk.singh@bttu.ac.in>

Approval by Dr. G. K. Singh IIT Roorkee for completion and record

----- Forwarded message -----
From: G. K. Singh <gk.singh@bttu.ac.in>
Date: Thu Aug 6, 2020 at 3:50 PM
Subject: Re: Comments and Approval
To: Head Electrical <noden@bttu.ac.in>

It is okay and approved from my end
GK Singh

On Thu, 6 Aug 2020 11:37 am Head Electrical <noden@bttu.ac.in> wrt
Respected Sir

Of late, a change in the structure of 3rd semester B. Tech. has been c
Accordingly, changes have been made, and a document has been pri

Kindly acknowledge, give your comments and approval at the earliest

Charan Sparsh!

Dr Yadvir Singh
Professor & Head
Department of Electrical Engineering
Harcourt Butler Technical University

(Handwritten Signature)
05/07/20

Fwd: Comments and Approval

Inbox



Chhabindra Nath Singh

Jun 18,
2022, 4:51
PM

to me

----- Forwarded message -----

From: **Head Electrical** <hodee@hbtu.ac.in>
Date: Thu, Aug 6, 2020, 4:13 PM
Subject: Fwd: Comments and Approval
To: Chhabindra Singh <cnsinghhbti7@gmail.com>

Approval by Dr. G. K. Singh IIT Roorkee for compilation and record

----- Forwarded message -----

From: **G. K. Singh** <gksngfee@gmail.com>
Date: Thu, Aug 6, 2020 at 3:50 PM
Subject: Re: Comments and Approval
To: Head Electrical <hodee@hbtu.ac.in>

It is okay and approved from my end.

GK Singh

On Thu, 6 Aug 2020 11:37 am Head Electrical <hodee@hbtu.ac.in> wrote:
Respected Sir

Of late, a change in the structure of 3rd semester B. Tech. has been communicated by the DoAA, HBTU, Kanpur (Please see the Attachment). Accordingly, changes have been made, and a document has been prepared (same as Attachment) for 3rd semester B. Tech. (EE).

Kindly acknowledge, give your comments and approval at the earliest possible.

Charan Sparsh!

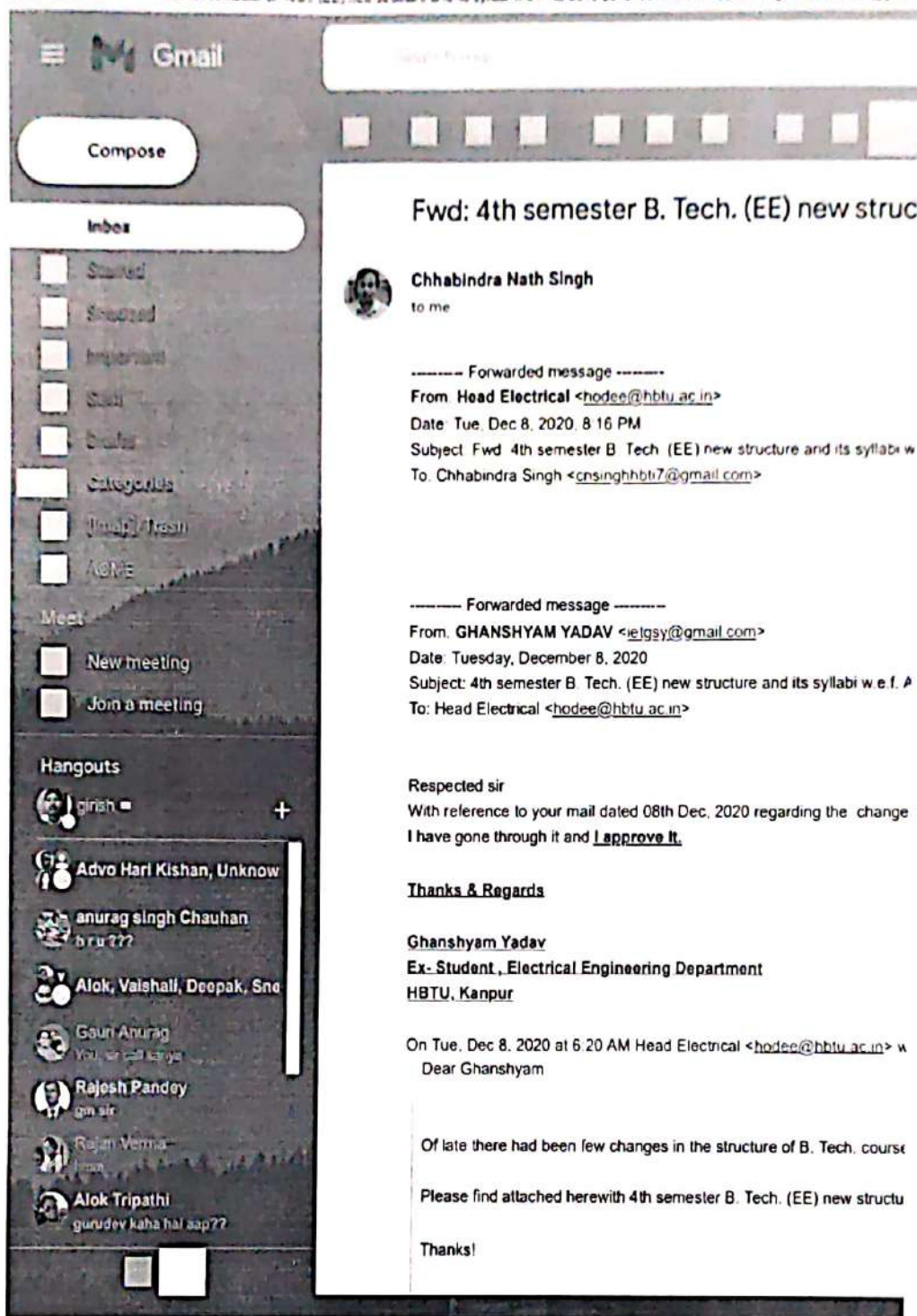
Dr. Yaduvir Singh
Professor & Head

Summary of BOS 2019-20

Date	BOS 2019-20	Subject	Decision/ Remark
08-12-20	Mail Sent to Mr. Ghanshyam Yadav (Alumni) Alimco Kanur	Course Structure of Fourth Semester	Approve

[Handwritten signature]
05/07/2022

[Handwritten signature]
11/07/2022
Head, Electrical Engineering Department
School of Engineering
H.B.T.U. Kanpur-208002



https://mail.google.com/mail/u/0/?tab=rm&ogbl=inbox/FMfczGpGTLnJwsMpDxhqlDrJFHVfCQV

1/1

Fwd: 4th semester B. Tech. (EE) new structure and its syllabi w.e.f. AS 2019-20 for comments / approval

Inbox



Chhabindra Nath Singh

[Handwritten signature]
05/07/22

Jun 18, 2022,
4:50 PM

to me

----- Forwarded message -----

From: Head Electrical <hodee@hbtu.ac.in>

Date: Tue, Dec 8, 2020, 8:16 PM

Subject: Fwd: 4th semester B. Tech. (EE) new structure and its syllabi w.e.f. AS 2019-20 for comments / approval

To: Chhabindra Singh <cnsinghhbti7@gmail.com>

----- Forwarded message -----

From: GHANSHYAM YADAV <ietgsy@gmail.com>

Date: Tuesday, December 8, 2020

Subject: 4th semester B. Tech. (EE) new structure and its syllabi w.e.f. AS 2019-20 for comments / approval

To: Head Electrical <hodee@hbtu.ac.in>

Respected sir

With reference to your mail dated 08th Dec, 2020 regarding the changes in the structure of B. Tech. courses & enclosed 4th semester B. Tech. (EE) new structure and its syllabi w.e.f. AS 2019-20. I have gone through it and **I approve It.**

Thanks & Regards

Ghanshyam Yadav

Ex- Student , Electrical Engineering Department

HBTU, Kanpur

On Tue, Dec 8, 2020 at 6:20 AM Head Electrical <hodee@hbtu.ac.in> wrote:

Dear Ghanshyam

Of late there had been few changes in the structure of B. Tech. courses, as communicated by the Dean of Academic Affairs of this university.

Please find attached herewith 4th semester B. Tech. (EE) new structure and its syllabi w.e.f. AS 2019-20. Kindly send your comments, if any, and its approval within a week, if possible.

Thanks!

Dr. Yaduvir Singh

Professor & Head

Department of Electrical Engineering

Harcourt Butler Technical University

Kanpur, Uttar Pradesh- 208 002 India

08 / 12 / 2020



Summary of BOS 2019-20

Date	BOS 2019-20	Subject	Decision/ Remark
21-07-20	Mail Sent to Mr. Arvind Dixit (Industry)	Course Structure of Final Year	Approve
24-07-20	Mail Sent to Dr. Rajesh Gupta MNNIT Allahabad	Course Structure of Final Year	Approve with Suggestions

[Handwritten signature]
09/07/2022

[Handwritten signature]
11/07/2022

J. K. Dwivedi
Head, Electrical Engineering Department
School of Engineering
M. R. T. I. Kanpur-208002

Gmail

Re: COMPILED DETAILED SYLLABUS OF B. Tech. IV Year, EE (Compulsory and Programme Electives Courses) and Open Elective Courses (Non-Electrical Branches), NEW STRUCTURE, Effective from AS: 2020-21

Sat, Jul 25, 2020 at 11:20 AM

Jameel Hbtl <jameelhbtl@gmail.com>
To: hdtee@hbtu.ac.in

Dear Sir,
As per my opinion it is OK.

On Thu, Jul 23, 2020, 11:54 PM Jitendra Kumar Dwivedi <jkdwivedi.hbti@gmail.com> wrote:

Dear Sir,
I assume no one has any doubt regarding your proficiency in English language and I am positive your friends appreciate you for the same. But as far as I am aware, neither me nor any of us here is an English Professor. We belong to Electrical Engg. Dept. and what matters is that we should all be technically sound. Coming to the pressing issue, there are major ambiguities in the consolidated syllabus. As a member of the BoS, the above were my perceptions and I stand by them. The present draft is quite unfair to both students as well as the Professors.

Following is a table to better put forward my opinions. Kindly go through it and if you still can't understand the technical language, I am here to help you.

Sl No	Subject Code/s	Schedule of Subjects			Total Number of Lectures mentioned in the syllabus of the subject/s to cover the Theory Part	Minimum Number of Lectures should be in the syllabus of the subject/s to cover the Theory Part	Remark
		Lecture (L)	Tutorial (T)	Practical (P)			
1	EEE-411, EEE-415, EEE-417, EEE-423, EEE-427, EEE-429, EEE-431, OEE-433, OEE-435	3	0	0	30	40	contents in the syllabus should be added/ upgraded for 40 lecture hours
2	EEE-419	3	0	0	30	40	contents in the syllabus should be added/ upgraded for 40 lecture hours
3	EEE-425	3	0	0	Not mentioned	40	Corrections needed accordingly
4	EEE-442	3	1	0	Not mentioned	40	Corrections needed accordingly
5	EEE-454	3	1	0	45	40	1. contents in the syllabus should be reduced to 40 lecture hours. 2. number of modules to be reduced to five from six.
6	EEE-413	3	0	0	40	40	number of modules to be reduced to five from six.
7	In some of the subjects, there is huge variation in terms of lectures needed to cover the different modules. Even in some subjects the number of lecture hours mentioned to cover the first module is 4 or 5 whereas to cover the contents of other modules i.e. modules 2,3,4,5 lecture hours mentioned are 9 or 10 or 11. As all the modules of any subject have the same weightage in terms of marks therefore there should be approximately equal number of lecture hours to cover the contents of individual modules of that subject.						
8	Here it is necessary to mention that number of lecture assigned in the structure to cover the contents of any subject are '3' irrespective of credits. Tutorials and Practical hours cannot be considered as Lecture hours to cover the theory part. Tutorial and Practical hours are meant for tutorial and practical. Therefore minimum lectures needed to cover the theory part of the syllabuses of the subjects which have the same number of lecture assigned in the structure must be equal.						
9	As you have mentioned that this document is going to be considered as proceeding of BoS, it is my request that every member of BoS have to give their comment on the common mail so that everyone can be aware of comment/s of others for incorporation/discussion before finalization. It is also my request to host an online meeting of BoS.						

Regards,

On Thu 23 Jul, 2020, 12:31 PM Yaduvir Singh, <dryaduvirsingh@gmail.com> wrote:

I hope I have some proficiency on language, therefore, according to me there is no ambiguity, however always there is chance of improvement so you please communicate, what should have been the text?

This document will eventually become proceedings of BoS.

For corrections, if logically admissible, through this email I am requesting Mr C N Singh to incorporate these. 3 0 0 will have three lectures and 3 1 0 will have 4 hours of weekly engagement.

Prof Dr Yaduvir Singh
23/07/2020

On Thu, 23 Jul 2020 at 12:45 AM, Jitendra Kumar Dwivedi <jkdwivedi.hbti@gmail.com> wrote:

Sir,

From the wordings of your mail it "Please go through the attachment. Give your comments if any, and mention "I approve it" latest by 23rd July, 2020. In your reply email, This document belongs to the students, department and the university" it is not clear whether it is the proceeding of BoS or exercise prior to BoS. Please specify/clarify so that I can mention my view accordingly.

<https://mail.google.com/mail/u/0/?ik=b2cf6a1f78&view=pt&search=all&permthld=thread-f%3A1673166812350788407&siml=msg-f%3A167316681235...> 1/5

on going through the compiled/consolidated syllabi of final year B.Tech.(EE), following are my observations which need the attention of all faculty members of the department:

1. The total number of lectures required for the completion of the subject codes EEE-411, 415, 417, 423, 427, 429, 431, OEE-433, 435 are only 30 whereas the contents of the syllabus of each subject must be of that size that require at least 40 lecture hours. Hence the contents in the syllabus should be added/upgraded. As the number of lectures per week assigned to PCC, PEC-I, O, III, IV, OEE-411 are equal i.e. 03 in respect of the credits.
2. The total number of lectures required for the completion of the subject codes EEE-419 are only 28 which should also be corrected as mentioned in point 1 above.
3. The total number of lectures required for the completion of the subject codes EEE-425, 442 are not mentioned and these subjects are related to me therefore I will make the corrections accordingly.
4. The total number of lectures required for the completion of the subject codes EEE-454 are 45 which needed the reduction in contents to cover-up in 40 lecture hours. As this subject is also related to me and therefore I will make the corrections accordingly and resubmit it.
5. In some of the subjects, there is huge variation in terms of lectures needed to cover the various modules. Even somewhere it is half or below half art other modules which needs reconstruction of modules so that nearly equal number of lectures should be required to cover-up each module. It is important because each module has the same marks weightage.
6. There are some mistakes in the number of modules in the subjects EEE-413, 454. As these subjects belong to me therefore I will make the corrections accordingly.

Jitendra Kumar Dwivedi,
Associate Professor & Ex. Head
Department of Electrical Engineering
School of Engineering
Harcourt Butler Technical University
(Formerly Harcourt Butler Technological Institute, Kanpur)
(An state technical university of Government of Uttar Pradesh)
Nawabganj, Kanpur
Uttar Pradesh-208002

Phone : +91-9721456026,
+91-9792320000

Email IDs : jkdwivedi.hbti@gmail.com, jkdwivedi.hbti@rediffmail.com

On Tue, Jul 21, 2020 at 6:17 PM Yaduvir Singh <dryaduvirsingh@gmail.com> wrote:
All Regular Faculty Members - EED

Please go through the attachment. Give your comments if any, and mention "I approve it" latest by 23rd July, 2020 in your reply email. This document belongs to the students, department and the university.

Dr. Yaduvir Singh
Professor & Head - EED, HBTU, Kanpur UP, India
21/07/2020

Thanks and Regards! / Greetings!

Prof. (Dr.) Yaduvir Singh

Ph.D. (Industrial Electronics), M.B.A., M. E., B. Sc. Engineering
FIETE, LMISTE

Professor & Head
Department of Electrical Engineering (EED), HBTU, Kanpur

Ex-Dean (Planning & Resource Generation), HBTU / HBTU, Kanpur
Ex-Coordinator, World Bank TEQIP, HBTU / HBTU, Kanpur
Ex-Director, NIET, Gr. Noida
Ex-Executive Director, NIET Business School, Gr. Noida
Ex-Faculty, Thapar University Patiala, NERIST Itanagar, HBTU, Kanpur, G B Pant Engineering College, Uttarakhand

School of Engineering (SoE)
Harcourt Butler Technical University (HBTU)
(An state technical university of Government of Uttar Pradesh)
Nawabganj, Kanpur
Uttar Pradesh-208002

Phone : 09872980550

Email IDs: dryaduvirsingh@gmail.com, yad_pra@yahoo.com

/ / 2020

Thanks and Regards! / Greetings!

Prof. (Dr.) Yaduvir Singh

Ph.D. (Industrial Electronics), M.B.A., M. E., B. Sc. Engineering
FIETE, LMISTE

Professor & Head
Department of Electrical Engineering (EED), HBTU, Kanpur

Ex-Dean (Planning & Resource Generation), HBTU / HBTU, Kanpur
Ex-Coordinator, World Bank TEQIP, HBTU / HBTU, Kanpur
Ex-Director, NIET, Gr. Noida
Ex-Executive Director, NIET Business School, Gr. Noida
Ex-Faculty, Thapar University Patiala, NERIST Itanagar, HBTU, Kanpur, G B Pant Engineering College, Uttarakhand

School of Engineering (SoE)
Harcourt Butler Technical University (HBTU)
(An state technical university of Government of Uttar Pradesh)

7/5/22, 12:20 PM

Fwd: COMPILED DETAILED SYLLABUS OF B. Tech. IV Year, EE (Compulsory and Programme Electives Courses) and Open El

Gmail

Compose

Inbox

- Shared
- Starred
- Important
- Sent
- Drafts
- Categories
- Unread
- ACME

Meet

- New meeting
- Join a meeting

Hangouts

- English
- Adva Hari Kishan, Unknow
- anurag singh Chauhan hru ???
- Alok, Valshall, Deepak, Sne
- Gauri Anurag you, sircaal kanye
- Rajesh Pandey gm sir
- Rajan Verma

Search mail

Fwd: COMPILED DETAILED SYLLABUS OF (Non-Electrical Branches), NEW STRUCTU

 **Chhabindra Nath Singh**
to me

----- Forwarded message -----

From: Yaduvir Singh <dryaduvirsingh@gmail.com>
Date: Mon, Jul 27, 2020, 8:22 AM
Subject: Fwd: COMPILED DETAILED SYLLABUS OF B. Tech. IV Year.
To: cnsinghbti7 <cnsinghbti7@gmail.com>

----- Forwarded message -----

From: Arvind Dixit <atechindia@gmail.com>
Date: Mon, 27 Jul 2020 at 6:31 AM
Subject: RE: COMPILED DETAILED SYLLABUS OF B. Tech. IV Year, E
To: Yaduvir Singh <dryaduvirsingh@gmail.com>, Arvind Dixit <dixitarvin>

Dear sir
Refer to your email and details, as I have gone thru the same and "I
Pls feel free for any further suggestion or feedback,
I will be personally happy and push the best for quality education thru

Regards
Arvind dixit
Director & CEO
Advancetech India pvt ltd
Chandigarh

From: Yaduvir Singh [mailto:dryaduvirsingh@gmail.com]
Sent: 21 July 2020 18:28

Fwd: COMPILED DETAILED SYLLABUS OF B. Tech. IV Year, EE (Compulsory and Programme Electives Courses) and Open Elective Courses (Non-Electrical Branches), NEW STRUCTURE, Effective from AS: 2020-21

Inbox



Chhabindra Nath Singh

to me

Handwritten signature and date: 05/07/22

Jun 18, 2022, 4:59 PM

----- Forwarded message -----

From: **Yaduvir Singh** <dryaduvirsingh@gmail.com>

Date: Mon, Jul 27, 2020, 8:22 AM

Subject: Fwd: COMPILED DETAILED SYLLABUS OF B. Tech. IV Year, EE (Compulsory and Programme Electives Courses) and Open Elective Courses (Non-Electrical Branches), NEW STRUCTURE, Effective from AS: 2020-21

To: [cnsinghhbti7 <cnsinghhbti7@gmail.com>](mailto:cnsinghhbti7@gmail.com)

----- Forwarded message -----

From: **Arvind Dixit** <atechindia@gmail.com>

Date: Mon, 27 Jul 2020 at 6:31 AM

Subject: RE: COMPILED DETAILED SYLLABUS OF B. Tech. IV Year, EE (Compulsory and Programme Electives Courses) and Open Elective Courses (Non-Electrical Branches), NEW STRUCTURE, Effective from AS: 2020-21

To: [Yaduvir Singh <dryaduvirsingh@gmail.com>](mailto:dryaduvirsingh@gmail.com), [Arvind Dixit <dixitarvind16@gmail.com>](mailto:dixitarvind16@gmail.com)

Dear sir

Refer to your email and details , as I have gone thru the same and " I approve it " and you can go ahead with the same

Pls feel free for any further suggestion or feedback ,

I will be personally happy and push the best for quality education thru reputed university like your ;

Regards

Arvind dixit

Director & CEO

Advancetech india pvt ltd

Chandigarh

From: Yaduvir Singh [mailto:dryaduvirsingh@gmail.com]

Sent: 21 July 2020 18:28

To: Arvind Dixit; Arvind Dixit

Subject: Fwd: COMPILED DETAILED SYLLABUS OF B. Tech. IV Year, EE (Compulsory and Programme Electives Courses) and Open Elective Courses (Non-Electrical Branches), NEW STRUCTURE, Effective from AS: 2020-21

Dear Sri Dixit

As communicated earlier, you are the member of Board of Studies of this department of the university.

There had been some changes in Course Scheme as per AICTE model curriculum, for which department has created the detailed syllabus as per NBA requirements.

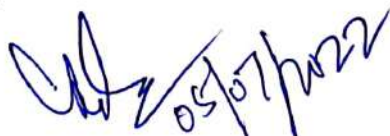
Please go through the attachment. It is syllabi for subjects of final year B Tech EE. For other years, syllabi was prepared in the past and got approved also by the competent authority. Only final year syllabi was left. The same has been created by the department now.

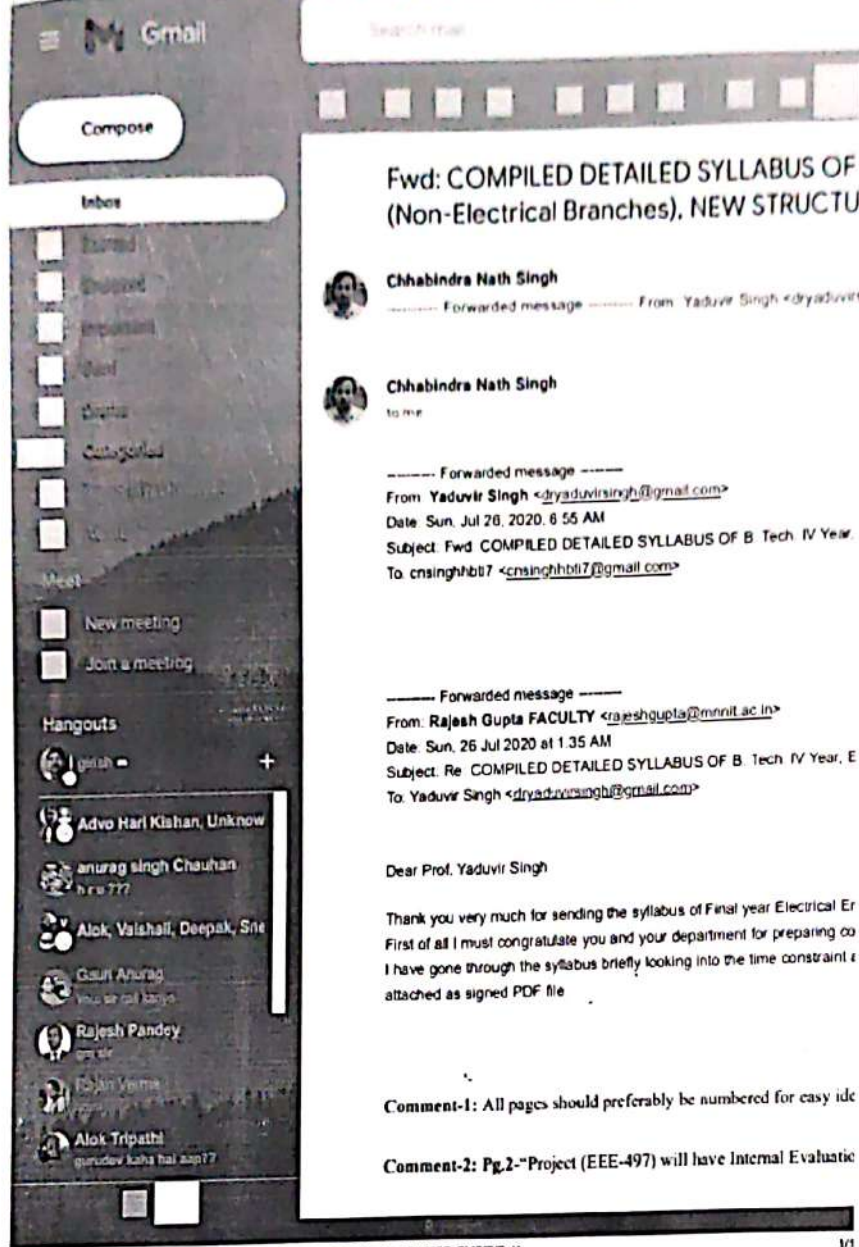
Kindly give your valuable comments and please mention "I approve it" in your reply email.

It has been planned to get it done by circulation due to Corona guidelines of the government.

Please acknowledge and reply.

Dr. Yaduvir Singh





Fwd: COMPILED DETAILED SYLLABUS OF B. Tech. IV Year, EE (Compulsory and Programme Electives Courses) and Open Elective Courses (Non-Electrical Branches), NEW STRUCTURE, Effective from AS: 2020-21

Inbox

 Chhabindra Nath Singh

Handwritten signature and date: 05/07/22

Jun 18, 2022, 4:59 PM

----- Forwarded message ----- From: Yaduvir Singh <dryaduvirsingh@gmail.com> Date: Mon, Jul 27,



Chhabindra Nath Singh

Jun 18, 2022
5 06 PM

to me

----- Forwarded message -----

From: Yaduvir Singh <dryaduvirsingh@gmail.com>

Date: Sun, Jul 26, 2020, 6:55 AM

Subject: Fwd: COMPILED DETAILED SYLLABUS OF B. Tech. IV Year, EE (Compulsory and Programme Electives Courses) and Open Elective Courses (Non-Electrical Branches), NEW STRUCTURE, Effective from AS: 2020-21

To: [cnsinghhbti7 <cnsinghhbti7@gmail.com>](mailto:cnsinghhbti7@gmail.com)

----- Forwarded message -----

From: Rajesh Gupta FACULTY <rajeshgupta@mnnit.ac.in>

Date: Sun, 26 Jul 2020 at 1:35 AM

Subject: Re: COMPILED DETAILED SYLLABUS OF B. Tech. IV Year, EE (Compulsory and Programme Electives Courses) and Open Elective Courses (Non-Electrical Branches), NEW STRUCTURE, Effective from AS: 2020-21

To: Yaduvir Singh <dryaduvirsingh@gmail.com>

Dear Prof. Yaduvir Singh

Thank you very much for sending the syllabus of Final year Electrical Engg. 2020-21. First of all I must congratulate you and your department for preparing course curricula based on Outcome based teaching following Bloom's Levels. . I have gone through the syllabus briefly looking into the time constraint and came out with some suggestions. If you deemed fit these may be considered which may further improve the quality and value of syllabus. I am appending these suggestions and also attached as signed PDF file.

Observations and Comments on Syllabi of B. Tech IV Year Electrical Engineering (20-21)

Comment-1: All pages should preferably be numbered for easy identification.

Comment-2: Pg.2-“Project (EEE-497) will have Internal Evaluation while Project (EEE-498) will have External Evaluation.”

Suggested Correction: It should be “Project (EEE-497) will have Internal Evaluation while Project (EEE-498) will have External Evaluation, towards ESE.

Comment-3: Pg.23- EEE421 Advance Power Electronics, Syllabus.

Suggested Correction: Some of the important converters are missing. Following are my suggestion in different modules.

Module 1: Review of Power Semiconductor Devices


05/10/2022

Review of Power diodes and SCR; Modern semiconductor devices: MOSFET, GTO, IGBT, GTO operating characteristics; driving circuits and protection, Comparison of switch ratings and Application area.

Module 2: DC-DC Converters and Power Supplies

Non-isolated converters: Buck, Boost, Buck-boost, Cuk, Sepic, Bipolar and Unipolar modulations, Isolated Converters: Forward, Flyback, Push-pull, Half bridge, Full bridge.

Module 3: DC-AC Inverters

Square wave, PWM, Sinusoidal PWM, Bipolar and Unipolar, Linear and over modulations, three-phase square wave and SPWM, Multilevel Inverters

Module 4: AC-DC Rectifiers

PWM converter, switch mode rectifiers, power factor improvement techniques, multi-pulse converters.

Module 5: AC to AC Conversion

Three-phase ac regulators, Single-phase and three-phase Cyclo-converters; Matrix converters.

Comment-4: Pg.84- EEE423 Advance Control System, Syllabus.

Suggested Correction: Some minor modification. Following are my suggestion in different modules.

Following topics of module 3 should be removed and merged with module 1: Lyapunov's stability theorems, Methods for generating Lyapunov functions, Popov's criterion.
Module 3 should be titled: Non-linear System

Comment-5: Pg.46- EEE444 Applied System Theory, Textbook and Reference are not sufficient.
I suggest to include books especially for Module-1 and Module-5.

Comment-5: Pg.49- EEE446 Power Quality and FACTS, Textbook and Reference are not sufficient.
May include following good books and reference.

- 1.A. Ghosh and G. Ledwich, Power Quality Enhancement using Custom Power Devices, Kluwer Academic Publisher, Boston, MA, 2002.
- 2.G. J. Walkileh, "Power Systems Harmonics", Springer Verlag, New York, 2001.
- 3.IEEE Standard 519-1992, IEEE recommended practices and requirements for harmonic control in electrical power systems, 1992

Comment-5: Pg.51- EEE448 Wind and Solar Energy System: Syllabus

Suggested Correction: Following are my suggestion in different modules.

Module-1 Power Scenario

Distribution of non-renewable and renewable installed capacity, Renewable energy types: solar, wind, small-hydro, marine, fuel cells, biomass etc., Modes of operation: Standalone, grid connected and hybrid systems.

Module-2 Wind Energy Systems – I

Introduction, Basic Principles of Wind Energy Conversion, History of Wind Energy, Wind Energy Scenario, The Power in the Wind, Forces on the Blades, Wind Energy Conversion, Windmills

Module-3 Wind Energy Systems – II

Power and wind speed characteristics, Fixed speed and Variable speed wind turbines, Synchronous generator, PMSG, Induction generator, doubly fed synchronous generator, Land vs. offshore wind turbines, Grid connected application, fully rated and partially rated converters control, rectifier-inverter system

Module-4 Solar Energy Systems – I

Solar Photovoltaic Systems: Introduction, Solar Cell Fundamentals, Solar Cell I-V and P-V Characteristics, Solar Module, and Array Construction, PV model and equations, efficiency, Series and parallel PV modules, partial shading condition, effect of bypass and blocking diodes, local and global maxima

Module-5 Solar Energy Systems – II

Open and closed loop MPPT methods, Hill-climbing/P&O and Incremental Conductance methods, DC-DC converters for MPPT, charge controller, Design methodology with and without energy storage, Grid connected and standalone PV system, Balance of system, PV string and array sizing, Battery bank, PCU, Inverter etc.

References:

1. Chetan Singh Solanki, *Solar Photovoltaics: Fundamental, Technologies and Applications*, 2nd ed. PHI Learning Pvt. Ltd., 2011.
2. Chetan Singh Solanki, *Solar Photovoltaics: Technology and Systems: A manual for Technicians, Trainers and Engineers*, PHI Learning Pvt. Ltd., 2014.
3. Mukund R. Patel, *Wind and Solar Power Systems*, CRC Press LLC, 1999.
4. S. N. Bhandra, D. Kastha and S. Banerjee, *Wind Electrical Systems*, Oxford University Press, 2005.
5. M. H. Rashid (ed), *Power Electronics Handbook*, Academic Press, Florida. 2001.

Comment-6: Following important subjects are there in the list of electives.

Power System Protection, Power Plant Engineering, Electrical Engineering Material

I hope some basics of these subjects are covered in their courses upto 3rd year. As these are important subjects from competitive examinations point of view.

With above comments I approve the Syllabus for 2020-21.

Regards

Dr. Rajesh Gupta (Ph.D IITK)
Senior Member IEEE
Professor
Department of Electrical Engineering
M. N. National Institute of Technology
Allahabad-211004, India
Ph. +91 532 2271410 (O)
+91 532 2271739 (R)

On Tue, Jul 21, 2020 at 6:51 PM Yaduvir Singh <dryaduvirsingh@gmail.com> wrote:
Dear Sir

As communicated earlier, you are the member of Board of Studies of this department of the university.
There had been some changes in Course Scheme as per AICTE model curriculum, for which department has created the detailed syllabus as per NBA requirements.
Please go through the attachment. It is syllabi for subjects of final year B Tech EE. For other years, syllabi was prepared in the past and got approved also by the competent authority. Only final year syllabi was left. The same has been created by the department now.
Kindly give your valuable comments and please mention "I approve it" in your reply email.
It has been planned to get it done by circulation due to Corona guidelines of the government.

Please acknowledge and reply.



Dr. Yaduvir Singh
Professor & Head - EED, HBTU, Kanpur UP, India
21/07/2020

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Thanks and Regards! / Greetings!

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Ph.D. (Industrial Electronics), M.B.A., M. E., B. Sc. Engineering
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Professor & Head
Department of Electrical Engineering (EED), HBTU, Kanpur

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Ex-Coordinator, World Bank TEQIP, HBTI / HBTU, Kanpur
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Ex-Executive Director, NIET Business School, Gr. Noida
Ex-Faculty, Thapar University Patiala, NERIST Itanagar, HBTI, Kanpur, G B Pant Engineering
College, Uttarakhand

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/ / 2020

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कार्यालय अधिष्ठाता, शैक्षिक क्रियाकलाप
हरकोर्ट बटलर प्राविधिक विश्वविद्यालय, कानपुर -02

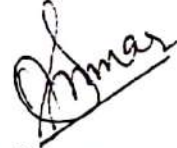
पत्रांक: 283 / शैक्षिक / कोर्स स्ट्रकचर / 2021

दिनांक: अगस्त 11, 2021

विभागाध्यक्ष, इलेक्ट्रीकल इंजी० विभाग
एच०बी०टी०यू०, कानपुर।

कृपया आपके द्वारा प्रेषित ई-मेल के माध्यम से बी०ओ०एस० की बैठक में अनुमोदित बी०टेक० पाठ्यक्रम के तृतीय एवं अंतिम वर्ष के कोर्स स्ट्रकचर एवं मूल्यांकन पद्धति पर मा० कुलपति महोदय द्वारा अनुमोदन प्रदान कर दिया गया है।

यह आपके सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।



(सुनील कुमार)

अधिष्ठाता, शैक्षिक क्रियाकलाप
मे

Proposed Course Structure and Syllabi as
per the B. Tech. Ordinance 2019-20 for
the Courses offered by the Department of
Electrical Engineering

To the
B. Tech. 3rd Year V Semester (Electrical
Engineering)



Department of Electrical Engineering
School of Engineering
Harcourt Butler Technical University
Kanpur-208 002

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B. Tech. V Semester Course Structure & Evaluation Scheme as per the B. Tech. Ordinance 2017-18, Effective from the Academic Session: 2019-20.

Semester V

Sr. No.	Course Type	Subject Code	Course Title	Credits (L-T-P)	Sessional Marks				ESM	Total
					MSE	TA	Lab.	Total		
1.	PCC	EEE-301	Electrical Machines-II	5 (3-1-2)	15	20	15	50	50	100
2.	PCC	EEE-303	Control System	5 (3-1-2)	15	20	15	50	50	100
3.	PCC	EEE-305	Power System-I	4 (3-1-0)	30	20	-	50	50	100
4.	PCC	EEE-307	Microprocessors	5 (3-1-2)	15	20	15	50	50	100

B. Tech. V Semester Course Structure & Evaluation Scheme as per the B. Tech. Ordinance 2019-20, Effective from the Academic Session: 2021-22.

Semester V

Sr. No.	Course Type	Subject Code	Course Title	Credits (L-T-P)	Sessional Marks				ESM	Total
					MSE	TA	Lab.	Total		
1.	PCC	EEE-351	Control System	4 (2-1-2)	15	20	15	50	50	100
2.	PCC	EEE-353	Microprocessors	4 (2-1-2)	15	20	15	50	50	100
3.	PCC	EEE-355	Electrical Machines-II	5 (3-1-2)	15	20	15	50	50	100
4.	PCC	EEE-357	Power System-I	3 (2-1-0)	30	20	-	50	50	100
5.	PCC	EEE-359	Utilization of Electrical Energy and Traction	3 (2-1-0)	30	20	-	50	50	100

Change 1

Existing (Old) as per the B. Tech. Ordinance 2017-18

EEE-301 Electrical Machines-II 3L: 1T: 2P 5 Credits Course Type: PCC

Proposed (New) as per the B. Tech. Ordinance 2019-20 (New - as per the change in course structure communicated by Dean of Academic Affairs HBTU, Kanpur) - for EED HBTU Kanpur action and approval

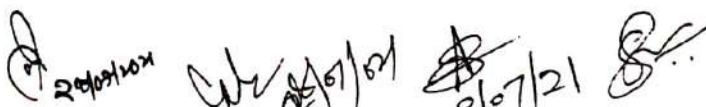
EEE-355 Electrical Machines-II 3L: 1T: 2P 5 Credits Course Type: PCC

Note: There is no change in the Course contents and Credits except Subject Code.

Change 2

Existing (Old) as per the B. Tech. Ordinance 2017-18

EEE-303 Control System 3L: 1T: 2P 5 Credits Course Type: PCC



Proposed (New) as per the B. Tech. Ordinance 2019-20 (New - as per the change in course structure communicated by Dean of Academic Affairs, HBTU Kanpur) - for EED HBTU Kanpur action and approval

EEE-351 Control System 2L: 1T: 2P 4 Credits Course Type: PCC

Note: Except above reduction in the Lecture Hours from 3 to 2, reduction in its credit from 5 to 4 and corresponding reduction in the Course contents in lieu of the reduction in Lecture Hours, there are no other changes.

Syllabus:

Module 1: Basic Concepts (7 Lectures)

Systems-Types of control systems, Notion of feedback. Open and Closed loop systems. Fundamental control actions (ON/OFF control). Reduction of parameter variation and effects of disturbance by using negative feedback.

Module 2: Control System Components and Modelling (8 Lectures)

Servo Motors. Stepper Motor. Modelling and representations of control systems: Ordinary differential equations, Transfer functions. Block diagrams, Signal flow graphs.

Module 3: Time - Response Analysis (9 Lectures)

Test Signals, Time response of first order and second order systems, Time domain specifications. Steady state errors and error constants, Effect of addition of Poles and Zeros, PID Controllers - Derivative error, derivative output, integral error. Design specifications of second order systems. Performance indices.

Module 4: Time - Domain Analysis and Stability (7 Lectures)

Review of State variable technique; conversion of State variable model to Transfer Function model and vice-versa, Diagonalization, Controllability and Observability and their Testing. Solution of state equations, Stability: Concept, Algebraic criteria and conditions. Characteristic equation. Routh-Hurwitz criteria and limitations, Root locus concept and construction.

Module 5: Frequency - Domain Analysis and Stability (9 Lectures)

Frequency responses and Frequency domain specifications - Concepts of gain margin and phase margin. Nyquist stability criterion. Nyquist plot. Bode plots, Nichol's chart, Concepts of Lead, Lag and Lead-lag compensators.

Control System Laboratory

Note: The minimum of 08 experiments are to be performed from the following:

Hardware based experiments

1. To determine response of first order and second order systems for step input for various values. of constant K using linear simulator unit and compare theoretical and practical results.
2. To study P, PI and PID temperature controller for an oven and compare their performance.
3. To study and calibrate temperature using resistance temperature detector (RTD).
4. To study DC position control system.
5. To determine speed-torque characteristics of an AC servomotor.
6. To study Solar and Wind Energy Systems on FESTO set up LabVolt Series 8960 - 2A.
7. To study Industrial Training Control System on FESTO set up LabVolt Series 3103 - 40.

Software based experiments (Use MATLAB)

1. To determine time domain response of a second order systems for step input and obtain performance parameters.

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2. To convert transfer function of a system into state space form and vice-versa.
3. To plot root locus diagram of an open loop transfer function and determine range of gain k for stability.
4. To plot a Bode diagram of an open loop transfer function.
5. To draw a Nyquist plot of an open loop transfer functions and examines the stability of the closed loop system.

Text Books:

1. B.C. Kuo, and F. Golnaraghi, Automatic Control Systems, 9th Edition, Wiley India Pvt limited 2014 (Student edition).
2. Yaduvir Singh & S. Janardhanan, "Modern Control Engineering", Cengage Learning
3. J.J Nagrath and M Gopal, Control Systems engineering, 5th Edition, New Age International, 2007.

Reference Books:

1. Katsuhiko Ogata, Modern Control Engineering, 5th edition, PHI, 2010.
2. Norman S. Nise, Control Systems Engineering, 6th edition, John Wiley, 2010. (Indian edition).
3. M Gopal, Control Systems-Principles and Design, 4th Edition, McGraw Hill India, 2012.

Change 3

Existing (Old) as per the B. Tech. Ordinance 2017-18

EEE-305 Power System-I 3L: 1T: 0P 4 Credits Course Type: PCC

Proposed (New) as per the B. Tech. Ordinance 2019-20 (New - as per the change in course structure communicated by Dean of Academic Affairs, HBTU, Kanpur) - for EED HBTU Kanpur action and approval

EEE-357 Power System-I 2L: 1T: 0P 3 Credits Course Type: PCC

Note: Except above reduction in the Lecture Hours from 3 to 2 and its reduction in credit from 4 to 3 there are no other changes.

Syllabus:

Module 1: Power System Components (8 Lectures)

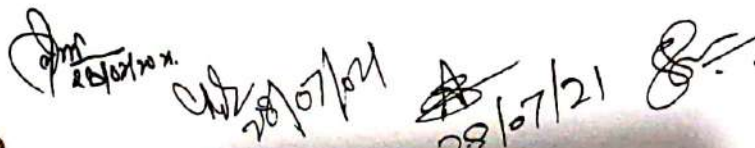
Single line Diagram of Power system. Brief description of power system elements: Synchronous machine, transformer, transmission line, bus bar, circuit breaker and isolator, Supply System. Different kinds of supply system and their comparison, choice of transmission voltage. Transmission Lines: Configurations, types of conductors, resistance of line, skin effect, Kelvin's law, Proximity effect.

Module 2: Over Head Transmission Lines (8 Lectures)

Calculation of inductance and capacitance of single phase, three phase, single circuit and double circuit transmission lines. Representation and performance of short, medium and long transmission lines. Ferranti effect, Surge impedance loading.

Module 3: Corona and Interference (8 Lectures)

Phenomenon of corona, corona formation, calculation of potential gradient, corona loss, factors affecting corona, methods of reducing corona and interference, Electrostatic and electromagnetic interference with communication lines. Overhead line Insulators: Type of insulators and their

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applications, potential distribution over a string of insulators, methods of equalizing the potential, string efficiency.

Module 4: Mechanical Design of transmission line (8 Lectures)

Catenary curve, calculation of sag & tension, effects of wind and ice loading, sag template, vibration dampers Insulated cables: Type of cables and their construction, dielectric stress, grading of cables, insulation resistance, capacitance of single phase and three phase cables, dielectric loss, heating of cables

Module 5: Neutral grounding and electrical design of transmission line (8 Lectures)

Necessity of neutral grounding, various methods of neutral grounding, earthing transformer, grounding practices Electrical Design of Transmission Line: Design consideration of EHV transmission lines, choice of voltage, number of circuits, conductor configuration, insulation design, selection of ground wires, EHV AC and HVDC Transmission: Introduction to EHV AC and HVDC transmission and their comparison, use of bundle conductors, kinds of DC links, and incorporation of HVDC into AC system.

Text Books:

1. W. D. Stevenson, "Element of Power System Analysis", McGraw Hill.
2. C. L. Wadhwa, "Electrical Power Systems" New age international Ltd. Third Edition.
3. Asfaq Hussain, "Power System", CBS Publishers and Distributors.
4. B. R. Gupta, "Power System Analysis and Design" Third Edition, S. Chand & Co.

Reference Books:

1. M. V. Deshpandey, "Elements of Power System Design", Tata McGraw Hill.
2. Soni, Gupta & Bhatnagar, "A Course in Electrical Power", Dhanpat Rai & Sons.
3. S. L. Uppal, "Electric Power", Khanna Publishers.

Change 4

Existing (Old) as per the B. Tech. Ordinance 2017-18

EEE-307 Microprocessors 3L: 1T: 2P 5 Credits Course Type: PCC

Proposed (New) as per the B. Tech. Ordinance 2019-20 (New - as per the change in course structure communicated by Dean of Academic Affairs, HBTU, Kanpur) - for EED HBTU Kanpur action and approval

EEE-353 Microprocessors 2L: 1T: 2P 4 Credits Course Type: PCC

Note: Except above reduction in the Lecture Hours from 3 to 2 and its reduction in credit from 5 to 4 there are no other changes.

Syllabus:

Module 1: Fundamentals of Microprocessors: (6 Hours)

Microprocessor and Microprocessor Development Systems: Evolution of Microprocessor, Microprocessor architecture and its operations, memory, inputs-outputs (I/Os), data transfer schemes interfacing devices, architecture advancements of microprocessors, typical microprocessor development system, Fundamentals of Microprocessor Architecture: 8-bit Microprocessor architecture, Internal Block Diagram, CPU, ALU, address, data and control bus, Clock and RESET circuits, Stack and Stack Pointer, Program Counter, I/O ports, Memory Structures, Data and Program Memory.

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Module 2: 8 Bit Microprocessor (7 Hours)

8085 microprocessor, pin configuration, internal architecture, Timing & Signals, ALU, machine cycles, Buses and CPU Timings, Bus size and signals, machine cycle timing diagram, instruction addressing, register indirect addressing, immediate addressing, and implicit addressing, instruction format, op-codes, mnemonics, no. of bytes, no. of machine cycles and T states, addressing modes, Instruction Classification, Data transfer, arithmetic operations, logical operations, branching operation, machine control, Writing assembly Language programs, Assembler directives.

Module 3: 16-bit Microprocessors (8 Hours)

Architecture: Architecture of INTEL 8086 (Bus Interface Unit, Execution unit), register organization, memory addressing, memory segmentation, Operating Modes Instruction Set of 8086, Addressing Modes, Instruction format, data transfer, arithmetic, logic string, branch control transfer, processor control, Interrupts, Hardware and software interrupts, responses and types.

Module 4: Instruction Set and Programming (9 Hours)

Addressing modes: Introduction, Instruction syntax, Data types, Subroutines Immediate addressing, Register addressing, Direct addressing, Indirect addressing, Relative addressing, Indexed addressing, 8085 and 8086 Instruction set, Instruction timings, Data transfer instructions, Arithmetic instructions, Logical instructions, Branch instructions, Subroutine instructions, Bit manipulation instruction, Assembly language programs.

Module 5: Peripheral Interfacing: (10 Hours)

I/O programming: Programmed I/O, Interrupt Driven I/O, DMA I/O interface: serial and parallel Communication, memory I/O mapped I/Os, Peripheral Devices: 8237 DMA controller, 8255 Programmable peripheral interface, 8253-8254 Programmable timer/counters, 8259 programmable Interrupt Controller.

Text Books:

1. R. S. Gaonkar, "Microprocessor Architecture: Programming and Applications with the 8085", Penram International Publishing, 1996.
2. D. V. Hall, "Microprocessors & Interfacing", McGraw Hill Higher Education, 1991.
3. Brey, Barry B. / "INTEL microprocessors" / Prentice Hall (India).
4. Liu and Gibson G.A. / "Microcomputer Systems: The 8086:8088 Family" / Prentice Hall (India).
5. D. A. Patterson and J. H. Hennessy, "Computer Organization and Design: The Hardware/Software interface", Morgan Kaufman Publishers, 2013

Reference Books:

1. A.K. Ray, & K.M. Bhurchandi, "Advanced Microprocessors and Peripherals: Architecture, Programming and Interfacing", Tata McGraw Hill.
2. B. P. Singh, "Advanced Microprocessors and Microcontrollers" New Age International.
3. Kenneth J. Ayala, "The 8086 Microprocessor Programming & Interfacing the PC", Penram International Publishing (India) Limited.

Web Reference:

1. Video/Web contents on NPTEL..

List of Experiments:

- To study 8085 based microprocessor system.
- To study 8086 based microprocessor system.
- To perform mathematical operations like addition, subtraction, multiplication and division on 8-bit processor 8085.

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4. To perform mathematical operations like addition, subtraction, multiplication and division on 16-bit processor 8086.
5. To develop and run a program for finding out the largest/smallest number from a given set of numbers.
6. To develop and run a program for finding out the smallest number from a given set of numbers.
7. To develop and run a program for arranging in ascending order of a set of numbers
8. To develop and run a program for arranging in descending order of a set of numbers
9. To perform conversion of temperature from OF to OC and vice-versa
10. To perform mathematical operations like addition, subtraction, multiplication and division on 8-bit processor 8085.
11. To perform mathematical operations like addition, subtraction, multiplication and division on 16-bit processor 8086.
12. To obtain interfacing with PPI 8255 in I/O mode and BSR mode.
13. To obtain interfacing with 8253 and generation of square wave.
14. Understanding of Debug command on Advanced Microprocessors.
15. Microcontroller based mini project.

Change 5: Inclusion of a New PCC – for approval

EEE-359	Utilization of Electrical Energy and Traction	2L:1T:0P	3 Credits	Course Type: PCC
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Syllabus:

Module-I: Electric Heating

Advantages and Methods of Electric Heating: Resistance heating, Electric arc heating, Induction heating, Dielectric heating.

Module-II: Electric Welding

Electric Arc Welding, Electric Resistance welding, Electronic welding, Control Electrolyte Process: Principles of electro deposition, Laws of electrolysis, applications of electrolysis.

Module-III: Illumination

Various definitions, Laws of illumination, requirements of good lighting, Design of indoor and outdoor lighting systems, **Refrigeration and Air Conditioning:** Refrigeration systems, domestic refrigerator, Water cooler, Types of Air Conditioning, Window Air Conditioner.

Module-IV: Electric Traction-I

Types of electric traction, systems of track electrification, **Traction mechanics:** types of services, speed-time curve and its simplification, average and schedule speeds, Tractive effort, specific energy consumption, mechanics of train movement, coefficient of adhesion and its influence.

Module V: Electric Traction-II

Salient features of traction drives, Series-parallel control of dc traction drives (bridge transition) and energy saving, Power Electronic control of DC and AC traction drives, Diesel electric traction.

Text Books:

1. H. Partab, Art and Science of Electrical Energy" Dhanpat Rai & Sons.
2. G. K. Dubey, Fundamentals of Electric Drives, Narosa Publishing House.

Reference Books:

1. H. Partab, Modern Electric Traction" Dhanpat Rai & Sons.
2. C. L. Wadhwa, Generation, Distribution and Utilization of Electrical Energy, New Age International Publications.

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