



Government of India
Bhabha Atomic Research Centre
KNOWLEDGE MANAGEMENT GROUP

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Ref.No. KMG/APT/BoS-Sep 22 Minutes/2022/72

October 7, 2022
13

**Minutes of the Meeting of Board of Studies of HBNI (Engineering Sciences)
held on September 28, 2022**

- Agenda:**
1. Applications from Employees in CI for recognition as Faculty/M. Tech. Guide/PG Lecturer.
 2. Applications for Academic and Fellowship extension of PhD. Program.
 3. Review of revised syllabi of Engineering Sciences Disciplines of BARC TS.

The meeting was held in hybrid mode. The following members participated in the meeting:

- | | |
|---|--|
| 1. Prof. A. P. Tiwari- Convener | 5. Prof. J. Chattopadhyay- Member |
| 2. Prof. V. Kain- Co-Convener | 6. Prof.(Smt.) Paramita Mukherjee,
Member(through VC) |
| 3. Prof. (Smt.) Archana Sharma-
Member | 7. Prof. S.K. Pathak - Member |
| 4. Prof. V. G. Gaikar -
Member(through VC) | 8. Prof. A.K. Dureja-Member |

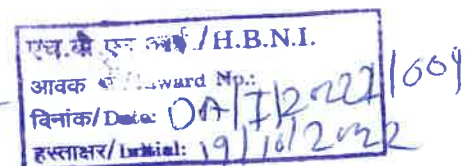
Five members, namely Prof. A.K. Bhattacharjee, Prof. C. P. Paul, Prof. R. Divakar, Prof. A.K. Nayak and Prof. Jane Alam could not join the meeting.

The following are the decisions as per the agenda of the meeting:

1. Applications received for recognition as Faculty/ M. Tech. Guide/ PG Lecturer under Engineering Sciences discipline of HBNI:

- (i) In all, 6 (six) applications for recognition as faculty and 2 (two) for recognition as M. Tech. guide were taken up for discussions.
- (ii) After detailed deliberations, all 6(six) applications for recognition as faculty have been approved, 1 (one) application as M. Tech. guide has been approved. However, one application for M. Tech. guide has been found suitable as PG Lecturer.
- (iii) Annexure-A shows the status of approval for each case.

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Prof. A.K. Dureja
for me
Mr. Mivedita
18/10/2022



2. Request for extension of DGFS-PhD/PhD/MTech/M.ScEngg.:

In all, 16 (Sixteen) applications were taken up for discussion. 15 (fifteen) DDFS applications from fellows enrolled in 2018 have been recommended for 5th year fellowship extension. One application, namely from Shri. Swapnil S. Bhashe has been recommended only for academic extension for 3rd year. The decision of BoS in respect of each application is shown in Annexure-B.

3. Review of Revised Syllabi of Engineering Sciences Disciplines of BARC Training School, Mumbai:

Revised Syllabi of Engineering Sciences Disciplines, namely Mechanical, Chemical, Civil, Metallurgy, Electrical, Electronics, Instrumentation and Computer Science, have been received from BARC with the approval of BARC Training School Engineering Committee. The syllabi have been revised as follows:


i) The following 7 (Seven) new courses have been proposed to be introduced as Core/Elective courses.

- a) Code Design for Process Equipment (for Mechanical & Chemical)
- b) Code design for Nuclear Pressure Vessels & Piping (for Mechanical)
- c) Service Life Estimation and Retrofitting of Concrete Structures (for Civil).
- d) Beyond Design Basis Events: Concepts and Assessment of Civil Structures (for Civil).
- e) Embedded Electronics Software and Embedded System Security (for Electrical, Electronics, Instrumentation & Computer Science)
- f) Machine learning & Data Analytics (for Computer Science)
- g) Digital Signal Processing and Applications in Image Processing & Machine Vision (for Electrical, Electronics, Instrumentation & Computer Science)

ii) The core courses 'Software Engineering' (for Computer Science), 'Code Design for PVP' (for Mechanical & Chemical) and Elective Course 'Computer Based System Design II' (for Electrical & Instrumentation) are proposed to be discontinued. Also the Advanced Machine Design (for Mechanical) was introduced as a core courses from elective course after thorough revision.

iii) Course credits and lecture hours have been reassigned.

After deliberations, BoS found the proposed revisions acceptable and recommended for approval. (Annexure-C).


(A P Tiwari)

Encl.: Annexure A, B and C.

To
Dean, HBNI

संयोजक, अध्ययन बोर्ड (इंजीनियरी विज्ञान)
Convener, Board of Studies (Engineering Sciences)
होमी भाभा राष्ट्रीय संस्थान
Homi Bhabha National Institute
अणुसक्तिनगर, मुंबई-400 094.
Anushaktinagar, Mumbai-400 094.

ANNEXURE - A
 Summary of Bos decision on Recognition as Faculty, M.Tech Guide, PG Lecturer (Engineering Sciences)
 (Bos Meeting Date: 28/09/2022)

Sr. No.	Name	CI/Unit	Applied for recognition as guide for Faculty/ M.Tech Guide/PG Teacher	Qualification	Year of Passing	Institute	No. of Publications including Technical Reports, Awards, etc.	Bos Recommendations
1	Dr. Soumitra Kar, SO/G	BARC	Faculty	B.Sc	2002	Utkal University	03-Book Chapters 28- Papers in Journals 22-Papers in Conferences 04- Tech. Reports 587-Citations 1 Patent filed in India DAE Tech. Excellence Award-2019 DAE Young Applied Sci./Tech. Award-2011	Recommended as Faculty
				M.Sc (Chem)	2004	IIT, Roorkee		
				M.Sc (Engg)	2011	HNMI, Mumbai		
2	Dr. Nirvik Sen, SO/E	BARC	Faculty	Ph.D(Engg)	2016	HNMI, Mumbai	NIL-No. of Books 34- Papers in Journals 12- Papers in Conferences 02- Technical Reports 333- Citations	Recommended as Faculty
				B.E (Chem)	2008	Jalavpur University		
				M.Tech	2012	HNMI, Mumbai		
3	Dr. Vikas Kumar Jain, SO/G	RRCAT	Faculty	Ph.D	2019	HNMI, Mumbai	01- No. of Books 14- Papers in Journals 62-Papers in Conferences 27-Tech. Reports 125- Citations 4 Patents granted in 4 countries	Recommended as Faculty
				B.E (Mech)	1992	Dr. H.S. Gaur University, Sagar, MP		
				Ph.D	2011	IIT Bombay, Mumbai		



4	Dr. Paritosh P. Nanekar, SO/H	BARC	Faculty	BE	1991	Nagpur University	01- No. of Book 14-Papers in Journals 64-Papers in Conferences 23-Tech. Reports 193-Citations	Recommended as Faculty
				Ph.D	2016	HBNI, Mumbai	Renowned expert in the field of NDT of NPP, DAE Homi Bhabha S&T Award 2020	
5	Dr. Sabyasachi Mitra SO/F	BARC	Faculty	BE	2002	Bengal Engineering College, Shibpur (D.U)	NIL- No. of Books 30-Papers in Journals 20-Papers in Conferences NIL-Tech. Reports NIL-Citations	Recommended as Faculty
				M.Tech	2005	IIT, Delhi		
				Ph.D	2018	HBNI, Mumbai		
				B.Tech	1990	Osmania University, Hyderabad		
6	Dr. Anand Rao K., SO/H+	BARC	Faculty	M.Tech	1999	JNTU, Hyderabad	03- No. of Books 16-Papers in Journals 63-Papers in Conferences 19-Tech. Reports 106-Citations, 07-H.index	Recommended as Faculty
				Ph.D	2016	HBNI, Mumbai		
				B.E	1999	Vir Naram Univ.		
7	Dr. Keyurkumar C. Pancholi, SO/G	BARC	M.Tech Guide	MS-Engg	2018	HBNI	07- Papers in Journals 13-Papers in Conferences NIL-Tech. Reports	Not Recommended as M.Tech guide. Instead recommended as PG Lecturer
				B.E	1999	Vir Naram Univ.		
8	Dr. Yogesh S. Ladola, SO/F	BARC	M.Tech Guide	Ph.D	2016	ICT, Mumbai	NIL- No. of Books 05 Papers in Journals 14-Papers in Conferences 02-Tech. Reports 58-Citations 1 Patent filed in India	Recommended as M.Tech Guide
				M.Tech	2005	IIT, Madras		
				B.E	2003	Saurashtra		

Dr. Paritosh P. Nanekar

Annexure-B
Summary of Bos decision regarding Extension of Fellowship
(Bos Meeting Date: 28.09.2022)

Sr. No.	Name	CI Name	Enrolment No.	Programme	Summary of Application Data	Bos Recommendations
1	Nandyala Pavan Kumar	BARC	ENGG01201804025	DDFS	Coursework & OGCE completed; Publications : 2] & 3C	Recommended for Extension of fellowship for 5 th year
2	K. Swetha	BARC	ENGG01201804032	DDFS	Coursework & OGCE completed; Publications : 1]	Recommended for Extension of fellowship for 5 th year
3	D. Satish Kumar	BARC	ENGG01201804033	DDFS	Coursework & OGCE completed; Publications : 1 Manuscript under review	Recommended for Extension of fellowship for 5 th year
4	Ajay Kumar Pandey	IPR	ENGG06201804006	DDFS	Coursework & OGCE completed; Publications : 2] & 3C	Recommended for Extension of fellowship for 5 th year
5	Vivek Kumar Mishra	IGCAR	ENGG02201804007	DDFS	Coursework & OGCE completed; Publications : 2]	Recommended for Extension of fellowship for 5 th year
6	Milaaan Patel	IPR	ENGG06201804009	DDFS	Coursework & OGCE completed Publications : 1]	Recommended for Extension of fellowship for 5 th year
7	G. Vinod Kumar	BARC	ENGG01201804023	DDFS	Coursework & OGCE completed Publications : 1] & 4C	Recommended for Extension of fellowship for 5 th year
8	Kanchi Sunil	BARC	ENGG01201804024	DDFS	Coursework & OGCE completed Publications : 1] & 6C	Recommended for Extension of fellowship for 5 th year
9	Deeksha Gupta	BARC	ENGG01201804026	DDFS	Coursework & OGCE completed Publications : 3] & 3C, 1 Manuscript under review	Recommended for Extension of fellowship for 5 th year
10	Madduri Sritja	BARC	ENGG01201804029	DDFS	Coursework & OGCE completed Publications : 3C	Recommended for Extension of fellowship for 5 th year
11	Nida Khan	BARC	ENGG01201804031	DDFS	Coursework & OGCE completed Publications : 1]	Recommended for Extension of fellowship for 5 th year
12	Ms. Vanya Goel	BARC	ENGG01201804022	DDFS	Coursework & OGCE completed Publications : 2] & 4C, 1 Manuscript under review	Recommended for Extension of fellowship for 5 th year
13	Rawat Bharatsingh Bhupendrasingh	IPR	ENGG06201804007	DDFS	Coursework & OGCE completed Publications : 2], 1 Manuscript under review	Recommended for Extension of fellowship for 5 th year
14	Ram Krushna Mohana	IPR	ENGG06201804008	DDFS	Coursework & OGCE completed Publications : 1 Manuscript under review	Recommended for Extension of fellowship for 5 th year
15	Rajnish Kumar Chaudhary	BARC	ENGG01201804030	DDFS	Coursework & OGCE completed Publications : 1]	Recommended for Extension of fellowship for 5 th year
16	Swapnil Shashikant Phase	BARC	ENGG01201504012	DDFS	Coursework & OGCE completed Pre synopsis held Publications : 1]	Recommended for Extension of fellowship for 5 th year

ANNEXURE - C

SYLLABUS

ENGINEERING SCIENCES

COURSE STRUCTURE - MECHANICAL ENGINEERING

NUCLEAR ENGINEERING (FOUNDATION COURSES)

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Accelerator Physics and Technology	EN501	40	5	150
2	Engineering Mathematics	EN502-503	30	4	125
3	Health Physics and Rad & Indl Safety	EN506	20	2	75
4	Nuclear Fuel Cycle Technology	EN508	35	4	150
5	NPP & Advanced Reactor Concepts	EN509	40	5	150
6	Reactor Physics and Engineering	EN510	55	7	225
Foundation Total			220	27	875

CORE ENGINEERING (MECHANICAL)

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Code design for Process Equipment	EN610	30	4	125
2	Computational Fluid Dynamics & Heat Transfer	EN611	50	6	200
3	Code design for Nuclear Pressure Vessels & Piping	EN614	30	4	125
4	Advanced Machine Design	EN617	25	3	100
5	Finite Element Methods	EN621	30	4	125
6	Fracture Mechanics	EN622	20	2	75
7	Mechanics of Solids	EN624	40	5	150
Core Total			225	28	900

ELECTIVES (MECHANICAL - Any 3 Courses - 9 Credits)

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Advanced Computational Techniques	EN701	30	4	100
2	Advanced Fracture Mechanics	EN704	30	4	100
3	Fluid Power Technology	EN709	25	3	100
4	Material Science in Nuclear Engineering - ME	EN712	25	3	100
5	Multi-scale material Modeling	EN715	30	4	100
6	Emergency Preparedness & Response	EN716	29	4	100
7	Reliability Engineering - ME	EN718	30	4	100
8	Vibrations	EN721	25	3	100
ELECTIVES TOTAL (APPROX)			90	9-12	300

THEORY TOTAL			535	64-67	2075
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SKILL ENHANCEMENT & ASSESSMENT

S.No.	Subject Title	Course Code	Credits	Marks
1	Viva Voce (I & II)	EN591	2	200
2	Practicals	EN592	1	100
3	Mini Project	EN593	9	300
TOTAL			12	600

M.TECH. THESIS WORK (SECOND YEAR)

1	Thesis Work	Dissertation	32	
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Total Contact Hrs: 535; Total Credits: 108-111; Total Marks: 2675

Note: Credit Requirement for M.Tech: 92 (60+32)

Credit Requirement for Non Trg Sch M.Sc.(Engg): 60

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COURSE STRUCTURE - CHEMICAL ENGINEERING

NUCLEAR ENGINEERING (FOUNDATION COURSES)

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Accelerator Physics and Technology	EN501	40	5	150
2	Engineering Mathematics	EN502-503	30	4	125
3	Health Physics and Rad & Indl Safety	EN506	20	2	75
4	Nuclear Fuel Cycle Technology	EN508	35	4	150
5	NPP & Advanced Reactor Concepts	EN509	40	5	150
6	Reactor Physics and Engineering	EN510	55	7	225
Foundation Total			220	27	875

CORE ENGINEERING (CHEMICAL)

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Advanced Chemical Reaction Engineering	EN601	25	3	100
2	Advanced Mass Transfer	EN604	25	3	100
3	Code design for Process Equipment	EN610	30	4	125
4	Computational Fluid Dynamics & Heat Transfer	EN611	50	6	200
5	Nuclear Chemical Engineering	EN628	35	4	150
6	Process Dynamics and Control	EN634	45	5	200
7	Process Modeling, Simulation and Optimization	EN635	45	5	200
CORE TOTAL			255	30	1075

ELECTIVES (CHEMICAL) - Any 3 Courses - 9 CREDITS

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Advanced Computational Techniques	EN701	30	4	100
2	Fluid Power Technology	EN709	25	3	100
3	Material Science in Nuclear Engineering-ME	EN712	25	3	100
4	Membrane Technology	EN714	25	3	100
ELECTIVES TOTAL (APPROX)			80	9-10	300

THEORY TOTAL			555	66-67	2225
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SKILL ENHANCEMENT & ASSESSMENT

S.No.	Subject Title	Course Code	Credits	Marks
1	Viva Voce (I & II)	EN591	2	200
2	Practicals	EN592	1	100
3	Mini Project	EN593	9	300
TOTAL			12	600

M.TECH. THESIS WORK (SECOND YEAR)

1	Thesis Work	Dissertation	32
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Total Contact Hrs: 555; Total Credits: 110-111; Total Marks: 2825

Note: Credit Requirement for M.Tech: 92 (60+32)
Credit Requirement for Non Trg Sch M.Sc.(Engg): 60

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COURSE STRUCTURE - METALLURGY

NUCLEAR ENGINEERING (FOUNDATION COURSES)

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Accelerator Physics and Technology	EN501	40	5	150
2	Engineering Mathematics	EN502,EN504	35	4	125
3	Health Physics and Rad & Indl Safety	EN506	20	2	75
4	Nuclear Fuel Cycle Technology	EN508	35	4	150
5	NPP & Advanced Reactor Concepts	EN509	40	4	150
6	Reactor Physics and Engineering	EN510	55	6	225
Foundation Total			220	25	875

CORE ENGINEERING (METALLURGY)

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Corrosion	EN615	15	2	75
2	Extractive Metallurgy of Less Common Metals	EN620	40	5	150
3	Mechanical Metallurgy	EN623	40	5	150
4	Nuclear Materials	EN629	50	6	200
5	Nuclear Metallurgy	EN630	30	4	125
6	Physical Metallurgy	EN631	40	5	150
7	Process Control & Instrumentation (MT)	EN632	25	3	100
CORE TOTAL			230	30	950

ELECTIVES (METALLURGY) - Any 3 Courses - 9 Credits

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Advanced Computational Techniques	EN701	30	4	100
2	Materials Characterization	EN713	20	2	75
3	Multi scale Material Modeling	EN715	30	4	100
4	Emergency Preparedness & Response	EN716	29	4	100
5	Welding Science & Technology	EN723	25	3	100
ELECTIVES TOTAL (APPROX)			75	9-12	275

THEORY TOTAL			525	64-67	2100
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SKILL ENHANCEMENT & ASSESSMENT

S.No.	Subject Title	Course Code	Credits	Marks
1	Viva Voce (I & II)	EN591	2	200
2	Practicals: Process Control Trainer; Nuclear Detectors	EN592	1	100
3	MiniProject	EN593	9	300
TOTAL			12	600

M.TECH. THESIS WORK (SECOND YEAR)

1	Thesis Work	Dissertation	32
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Total Contact Hrs: 525; Total Credits: 108-111; Total Marks: 2700

Note: Credit Requirement for M.Tech: 92 (60+32)

Credit Requirement for Non Trg Sch M.Sc.(Engg): 60(through course work and two viva)

COURSE STRUCTURE - CIVIL ENGINEERING

NUCLEAR ENGINEERING (FOUNDATION COURSES)

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Accelerator Physics and Technology	EN501	40	5	150
2	Engineering Mathematics	EN502-503	30	4	125
3	Health Physics and Rad & Indl Safety	EN506	20	2	75
4	Nuclear Fuel Cycle Technology	EN508	35	4	150
5	NPP & Advanced Reactor Concepts	EN509	40	5	150
6	Reactor Physics and Engineering	EN510	55	7	225
Foundation Total			220	27	875

CORE ENGINEERING (CIVIL)

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Civil Engg Design of Concrete & Steel Strcts I	EN608.1	30	4	125
2	Civil Engg Design of Concrete & Steel Strcts II	EN608.2	30	4	125
3	Design Basis Hazards & Geotechnical Engg	EN621	40	5	150
4	Earthquake Engineering & Structural Dynamics	EN609	45	6	200
5	Finite Element Methods	EN626	30	4	125
6	Mechanics of Solids	EN624	40	5	150
Core Total			215	28	875

ELECTIVES (CIVIL) - Any 3 Courses - 9 Credits

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Construction Materials, Management & Quality Assurance	EN708	30	4	100
2	Project Management	EN717	25	3	100
3	Safety & Reliability of Civil Engineering Structures (Mandatory)	EN722	25	3	100
4	Service Life Estimation and Retrofitting of Concrete Structures	EN710	25	3	100
5	Beyond Design Basis Events : Concepts and Assessment of Civil Structures	EN711	25	3	100
ELECTIVES TOTAL (APPROX)			86	10	300

THEORY TOTAL			515	65-66	2050
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SKILL ENHANCEMENT & ASSESSMENT

S.No.	Subject Title	Course Code	Credits	Marks
1	Viva Voce (I & II)	EN591	2	200
2	Practicals	EN592	1	100
3	Mini Project	EN593	9	300
TOTAL			12	600

M.TECH. THESIS WORK (SECOND YEAR)

1	Thesis Work	Dissertation	32		
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Total Contact Hrs: 515; Total Credits: 109-110; Total Marks: 2650

Note: Credit Requirement for M.Tech: 92 (60+32)

Credit Requirement for Non Trg Sch M.Sc.(Engg): 60

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COURSE STRUCTURE - ELECTRICAL ENGINEERING

NUCLEAR ENGINEERING (FOUNDATION COURSES)

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Accelerator Physics and Technology	EN501	40	5	150
2	Engineering Mathematics	EN502, 505	30	4	125
3	Health Physics and Rad & Indl Safety	EN506	20	2	75
4	Material Science in Nuclear Engineering (EE)	EN507	20	2	75
5	Nuclear Fuel Cycle Technology	EN508	35	4	150
6	NPP & Advanced Reactor Concepts	EN509	40	5	150
7	Reactor Physics and Engineering	EN510	55	7	225
FOUNDATION TOTAL			240	29	950

CORE ENGINEERING (ELECTRICAL)

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Advanced Electrical Engg. Design I	EN602	25	3	75
2	Computer Based System Design	EN612	35	4	100
3	Electrical Systems for Nuclear Power Plants and Facilities	EN618	35	4	125
4	Modern Control Systems Design and Simulation	EN625	35	4	150
5	Process Instrumentation & Control	EN633	30	4	125
6	Reactor Control Engineering & Instrumentation	EN637,638	45	6	150
7	Reliability Engineering (EE)	EN639	25	3	75
CORE TOTAL			230	28	800

ELECTIVES (ELECTRICAL) - Any 3 Courses - 9 Credits

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Advanced Electrical Engg. Design-II	EN702	25	3	100
2	Artificial Intelligence, Machine Learning & Applications	EN703	30	4	100
3	Digital Signal Processing, Image Processing & Applications	EN706	30	4	100
4	Embedded Electronics Software and Embedded System Security	EN707	25	3	100
5	Signal Conditioning, Recovery and EMI Aspects	EN719	30	4	100
6	Software Engineering	EN720	25	3	100
ELECTIVES TOTAL (APPROX)			80	9-12	300

THEORY TOTAL			550	66-69	2050
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SKILL ENHANCEMENT & ASSESSMENT

S.No.	Subject Title	Course Code	Credits	Marks
1	Viva Voce (I & II)	EN591	2	200
2	Practicals	EN592	1	100
3	Mini Project	EN593	9	300
TOTAL			12	600

M.TECH. THESIS WORK (SECOND YEAR)

1	Thesis Work	Dissertation	32
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Total Contact Hrs: 550; Total Credits: 110-113; Total Marks: 2650

Note: Credit Requirement for M.Tech: 92 (60+32)

Credit Requirement for Non Trg Sch M.Sc.(Engg): 60 (through course work and two viva)

COURSE STRUCTURE - ELECTRONICS ENGINEERING

NUCLEAR ENGINEERING (FOUNDATION COURSES)

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Accelerator Physics and Technology	EN501	40	5	150
2	Engineering Mathematics	EN502, 505	30	4	125
3	Health Physics and Rad & Indl Safety	EN506	20	2	75
4	Material Science in Nuclear Engineering (EE)	EN507	20	2	75
5	Nuclear Fuel Cycle Technology	EN508	35	4	150
6	NPP & Advanced Reactor Concepts	EN509	40	5	150
7	Reactor Physics and Engineering	EN510	55	7	225
FOUNDATION TOTAL			240	29	950

CORE ENGINEERING (ELECTRONICS)

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Advanced Electronic Circuit Design Techniques	EN603	30	4	125
2	Advanced Nuclear Instrumentation	EN605	40	5	150
3	Embedded & Computer Based Sys. Design	EN619	40	5	200
4	Process Instrumentation & Control	EN633	30	4	125
5	Reactor Control Engineering & Instrumentation	EN637-8	45	6	150
6	Reliability Engineering (EE)	EN639	25	3	75
CORE TOTAL			210	27	825

ELECTIVES (ELECTRONICS) - Any 3 Courses - 9 Credits

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Artificial Intelligence, Machine Learning & Applications	EN703	30	4	100
2	Digital Signal Processing, Image Processing & Applications	EN706	30	4	100
3	Embedded Electronics Software and Embedded System Security	EN707	25	3	100
4	Signal Conditioning, Recovery and EMI Aspects	EN719	30	4	100
5	Software Engineering	EN720	25	3	100
ELECTIVES TOTAL (APPROX)			96	10-12	300

THEORY TOTAL			540	66-68	2075
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SKILL ENHANCEMENT & ASSESSMENT

S.No.	Subject Title	Course Code	Credits	Marks
1	Viva Voce (I & II)	EN591	2	200
2	Practicals	EN592	1	100
3	Mini Project	EN593	9	300
TOTAL			12	600

M.TECH. THESIS WORK (SECOND YEAR)

1	Thesis Work	Dissertation	32
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Total Contact Hrs: 540; Total Credits: 110-112; Total Marks: 2675

Note: Credit Requirement for M.Tech: 92 (60+32)

Credit Requirement for Non Trg Sch M.Sc.(Engg): 60 (through course work and two viva)

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COURSE STRUCTURE - INSTRUMENTATION ENGINEERING

NUCLEAR ENGINEERING (FOUNDATION COURSES)

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Accelerator Physics and Technology	EN501	40	5	150
2	Engineering Mathematics	EN502, 505	30	4	125
3	Health Physics and Rad & Indl Safety	EN506	20	2	75
4	Material Science in Nuclear Engineering (EE)	EN507	20	2	75
5	Nuclear Fuel Cycle Technology	EN508	35	4	150
6	NPP & Advanced Reactor Concepts	EN509	40	5	150
7	Reactor Physics and Engineering	EN510	55	7	225
FOUNDATION TOTAL			240	29	950

CORE ENGINEERING (INSTRUMENTATION)

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Applied Process Instrumentation	EN607	40	5	150
2	Computer Based System Design	EN612	35	4	100
3	Modern Control Systems Design and Simulation	EN625	35	4	150
4	Reactor C&I and Human Machine Interface	EN636	35	4	150
5	Reactor Control Engineering & Instrumentation	EN637-8	45	6	150
6	Reliability Engineering	EN639	25	3	75
CORE TOTAL			215	26	775

ELECTIVES (INSTRUMENTATION) - Any 3 Courses - 9 Credits

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Artificial Intelligence, Machine Learning & Applications	EN703	30	4	100
2	Digital Signal Processing, Image Processing & Applications	EN706	30	4	100
3	Embedded Electronics Software and Embedded System Security	EN707	25	3	100
4	Signal Conditioning, Recovery and EMI Aspects	EN719	30	4	100
5	Software Engineering	EN720	25	3	100
ELECTIVES TOTAL (APPROX)			80	10-12	300

THEORY TOTAL			535	65-66	2025
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SKILL ENHANCEMENT & ASSESSMENT

S.No.	Subject Title	Course Code	Credits	Marks
1	Viva Voce (I & II)	EN591	2	200
2	Practicals	EN592	1	100
3	Mini Project	EN593	9	300
TOTAL			12	600

M.TECH. THESIS WORK (SECOND YEAR)

1	Thesis Work	Dissertation	32
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Total Contact Hrs: 535; Total Credits: 109-110; Total Marks: 2625

Note: Credit Requirement for M.Tech: 92 (60+32)

Credit Requirement for Non Trg Sch M.Sc.(Engg): 60 (through course work and two viva)

Signature

COURSE STRUCTURE - COMPUTER SCIENCE

NUCLEAR ENGINEERING (FOUNDATION COURSES)

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Accelerator Physics and Technology	EN501	40	5	150
2	Engineering Mathematics	EN502, 505	30	4	125
3	Health Physics and Rad & Indl Safety	EN506	20	2	75
4	Material Science in Nuclear Engineering (EE)	EN507	20	2	75
5	Nuclear Fuel Cycle Technology	EN508	35	4	150
6	NPP & Advanced Reactor Concepts	EN509	40	5	150
7	Reactor Physics and Engineering	EN510	55	7	225
FOUNDATION TOTAL			240	29	950

CORE ENGINEERING (COMPUTER SCIENCE AND ENGINEERING)

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Advanced Operating Systems	EN606	25	3	75
2	Computer Graphics & Visualisation	EN613	25	3	75
3	Distributed Computing	EN616	25	3	75
4	Network & Information Security	EN627	45	6	200
5	Reactor Control Engineering & Instrumentation-1	EN637	25	3	75
6	Reliability Engineering	EN639	25	3	75
7	Software Design Practices & Formal Methods	EN640	40	5	75
8	Machine Learning and Big Data Analytics	EN641	25	3	75
CORE TOTAL			230	28	725

ELECTIVES (COMP. SCIENCE AND ENGINEERING) - Any 3 Courses - 9 Credits

S.No.	Subject Title	Course Code	Hours	Credits	Marks
1	Artificial Intelligence, Machine Learning & Applications	EN703	30	4	100
2	Data Base Management System & Web Technology	EN705	30	4	100
3	Digital Signal Processing, Image Processing & Machine Vision	EN706	30	4	100
4	Embedded Electronics Software and Embedded System Security	EN707	25	3	100
3 ELECTIVES TOTAL (APPROX)			85	11-12	300

THEORY TOTAL			555	68-69	1975
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SKILL ENHANCEMENT & ASSESSMENT

S.No.	Subject Title	Course Code	Credits	Marks
1	Viva Voce (I & II)	EN591	2	200
2	Practicals	EN592	1	100
3	Mini Project	EN593	9	300
TOTAL			12	600

M.TECH. THESIS WORK (SECOND YEAR)

1	Thesis Work	Dissertation	32
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Total Contact Hrs: 555; Total Credits: 112-113; Total Marks: 2575

Note: Credit Requirement for M.Tech: 92 (60+32)

Credit Requirement for Non Trg Sch M.Sc.(Engg): 60 (through course work and two viva)

BoS (Engineering Sciences)

Sr. No.	Meeting No.	Date of Meeting	Convener/Chairman
1	01	12.08.2005	Dr. V. S. Raghunathan
2	02	11.11.2005	Dr. V. S. Raghunathan
3	03	04.01.2006	Dr. V. S. Raghunathan
4	04	M 10/05/07	
5	05	06.06.2006	Dr. V. S. Raghunathan
6	06A	28.07.2006	Dr. V. S. Raghunathan
7	06B	22.09.2006	Dr. B. K. Dutta
8	07	22.04.2007	Dr. B. K. Dutta
9	08	12.11.2007	Dr. B. K. Dutta
10	09	16.06.2008	Dr. B. K. Dutta
11	10	11.06.2009	Dr. B. K. Dutta
12	11	28.07.2010	Dr. B. K. Dutta
13	12	11.11.2010	Dr. B. K. Dutta
14	13	06.04.2011	Dr. B. K. Dutta
15	14	16.05.2012	Dr. B. K. Dutta
16	15	29.04.2013	Prof. P. K. Vijayan
17	16	M 10/05/17	
18	17	M 10/05/17	
19	18	16.04.2014	Prof. P. K. Vijayan
20	19	03.12.2014	Prof. P. K. Vijayan
21	20	18.04.2015	Prof. P. K. Vijayan
22	21	06.05.2015	Prof. P. K. Vijayan
23	22	30.10.2015	Prof. G. K. Dey
24	23	13.06.2016	Prof. G. K. Dey

25	24	17.11.2016	Prof. G. K. Dey
26	25	23.02.2017	Prof. G. K. Dey
27	26	28. Jun '2017	
28	27	31.08.17	Prof. A. P. Edward
29	28	14.12.17	
30	29	16.4.18	
31	30	14.6.18	
32	31	28.8.18	
33	32	12.10.18	
34	33	04.02.19	
35	34	08.08.19	
36	35	11.10.19	
37	36	6.2.20	