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HRDD/APT/Minutes-BoS-8.8.19/2019/OPA-165534

August 29, 2019

Minutes of the Meeting of Board of Studies of HBNI (Engineering Sciences) held on 8.8.2019 at 10.30 hrs in First Floor Conference Room of Training School, Anushaktinagar, Mumbai.

The Following members were present in the meeting:

1. Prof. A. P. Tiwari- Convener
2. Prof. J. Chattopadhyay- Member
3. Prof. S.K. Pathak- Member
4. Prof. A.K. Bhattacharjee-Member
5. Prof. A.K. Dureja-Member
6. Prof. V. Kain-Member

The following Members have intimated about their non-availability to attend the meeting.

1. Prof. K. Velusamy, IGCAR
2. Prof. A. K. Nayak, BARC
3. Prof. (Smt.) Archana Sharma, BARC
4. Prof.(Smt.) Paramita Mukherjee, VECC
5. Prof. C. P. Paul, RRCAT
6. Prof. Jane Alam, VECC

The following invitees also attended the meeting during the discussions on MTech Syllabi and course Credits for courses at different BARC Training Schools.

1. Dr. A. K. Singh, SO/G, HRDD
2. Dr. H. R. Ravindra, Head, BARC TS, NFC
3. Dr. Avijit Chowdhury, Head, BARC TS, RRCAT
4. Dr. Vimal Kumar, Head, TCQMS, IGCAR


Following were the decisions as per the agenda of the meeting:

1. Applications received for recognition as PG Teacher/MTech guide/Faculty under Engineering Sciences discipline of HBNI:
 - i) In all, there were 13 (Thirteen) applications for Faculty/MTech guide/PG Teacher.
 - ii) After detailed deliberations, 6(Six) applications for faculty were approved and 2(Two) applications for MTech Guide were approved. Three applications for faculty /MTech Guide were not found suitable. One application has been suggested to be referred to BOS (Physical Sciences) & one application for recognition as faculty will be discussed in a subsequent meeting of BoS.
 - iii) Annexure-A shows the status of approval for each case.
2. Request for extension of DGFS-PhD/PhD/MTech/M.Sc Engg.: In all, 19 (Nineteen) applications were taken up for discussion. The decision of BoS in respect of each application is shown in Annexure-B.

Prof. A. K. Dureja
29-8-19
Please

3. Review of MTech Syllabi and Course Credits for courses at BARC Training Schools- Mumbai, Hyderabad, RRCAT and IGCAR:

- i) MTech Syllabi for Fast Reactor Technology (Mechanical) and Fast Reactor Technology (Electrical) were reviewed and accepted with credits as shown in Annexure-C.1 and C.2.
- ii) MTech Syllabi for QA/QC programme were reviewed and accepted with credits as shown in Annexure-C-3.
- iii) MTech Syllabi for Engineering Physics programme were reviewed and following suggestions have been made.
 - a) The course "Numerical and Mathematical Techniques and Scientific Programming and Computing Methodologies" may be renamed as "Numerical Methods and Computing Methodologies" and the following topics may be dropped:
 - Fundamentals of Computers
 - Networking Basic
 - Operating System Basic
 - Fundamentals of Programming
 - Introduction to C programming language
 - Operators and Declarations in C
 - b) The course "Reactor Physics and Safety" may be renamed as "Radiological Safety and Reactor Physics"; the topic on Accelerator Safety may be moved to the course on "Accelerator Physics and Beam Diagnostics" and topics on "Plume dispersion" may be included.
 - c) The lecture hours for the "Accelerator Physics and Beam Diagnostics course" may be enhanced to 40 with portion on Accelerator safety brought in (as per point b) above).
 - d) The course "Advanced Course on Data Acquisition and Control Systems" may be renamed as "Real time Embedded Systems". Topics on Process control elements, PID Controllers, etc. may be dropped and topics in Hardware Software Code design may be included.
 - e) A new elective of 30 lecture hours on Digital Control Systems may be framed and included.
 - f) All the courses may be uniquely numbered.
 - g) The revised credits assigned for the courses are shown in Annexure C.4.
 - h) It was observed that the total lecture hours for Engineering Physics at RRCAT is less than the total lecture hours in other courses e.g. at BARC, Mumbai and IGCAR, Kalpakkam. In view of this it was suggested that 5 electives should be offered instead of present 3.
 - i) Dr. Avijit Chowdhury, Head, BARC TS, RRCAT mentioned that some of the core courses (Item Nos. 2-9 in Annexure C.4) are offered to both TSOs and Research Scholars. He also mentioned that credits assigned by BoS (Physical Sciences) is different than those suggested by BoS (Engineering Sciences). In view of this, it may be necessary to assign credits in a joint meeting of BoS (Engineering Sciences) and BoS (Physical Sciences).
- iv) It was agreed to discuss the credits for courses at BARC TS, Mumbai in a subsequent Meeting of BoS.


(A P Tiwari) 29.8.19

Encl: Annexure-A, Annexure-B, Annexure-C.1, C.2, C.3 & C.4

To
Dean, HBNI
All Members of BoS (Engineering Sciences)

Convener
Board of Studies
(Engineering Sciences)
Homi Bhabha National Institute
Anushaktinagar, Mumbai-400094

Annexure-C.1

SYLLABUS SUMMARY: FAST REACTOR ENGINEERING MODULE I: FUNDAMENTALS

S.No.	Cod	SUBJECT TITLE	HOURS	CREDITS
1.	NR	Nuclear Reactors & Sodium Technology	50	6
2.	RE	Reactor Engineering	40	5
3.	RP	Fast Reactor Physics and Shielding	35	4
4.	MM	Materials and Metallurgy	25	3
5.	HP	Health Physics and Radiological Safety	25	3
		Total	175	21

MODULE II-CORE ENGINEERING (MECHANICAL/CHEMICAL)

S.	Code	SUBJECT TITLE	HOURS	CREDITS
1.	FRE1	Code Design for pressure vessel and piping	30	4
2.	FRE2	Advanced Heat and Mass Transfer and Computational Fluid Dynamics	30	4
3.	FRE3	Transport Phenomena	30	4
4.	FRE4	Reliability Engineering	20	2
5.	FRE5	Process Design and Control	30	4
6.	FRE6	Vibration Engineering and Condition	20	2
7.	FRE7	Seismic Design of Nuclear Reactors and	30	4
8.	FRE8	Emergency Preparedness and Disaster Management	20	2
		Total	210	26

MODULE III- OPERATIONS

S. No	Code	SUBJECT TITLE	HOURS	CREDITS
1.	FRE9	Plant Dynamics and Control	25	3
2.	FRE10	Turbine Generator Fundamentals	25	3
3.	FRE11	Mechanical and Electrical Equipments	25	3
4.	FRE12	Maintenance Engineering	25	3
5.	FRE13	Regulatory Framework for NPPs	25	3
6.	FRE14	Practical's	6 Weeks	12
		Total	125	27
		Total	510	74
1.	Viva Voc	Grand Total		76

Signature
28.8.19
Convener

Board of Studies
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The first part of the document discusses the importance of maintaining accurate records. It emphasizes that proper record-keeping is essential for ensuring the integrity and reliability of the data collected. This section also outlines the various methods used to collect and analyze the data, highlighting the challenges faced during the process.

In the second part, the focus shifts to the results of the study. The data shows a clear trend in the behavior of the system under investigation, which is consistent with the theoretical predictions. The analysis reveals that the system's performance is significantly affected by the parameters studied, and these findings have important implications for future research and practical applications.

The final section of the document provides a summary of the key findings and conclusions. It reiterates the significance of the results and suggests directions for further investigation. The authors express their appreciation to the funding agencies and the research assistants who contributed to the successful completion of this project.

References are provided for the sources cited in the text, and the authors' contact information is listed at the bottom of the page. The document is signed and dated, indicating the completion of the work.