POSTGRADUATE BULLETIN

Department of

Nuclear Engineering (NE)

Chittagong University of Engineering & technology (CUET)
Chattogram-4349, Bangladesh

Published By

Department of Nuclear Engineering
Chittagong University of Engineering & technology
Chattogram-4349, Bangladesh

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CUET Main Gate

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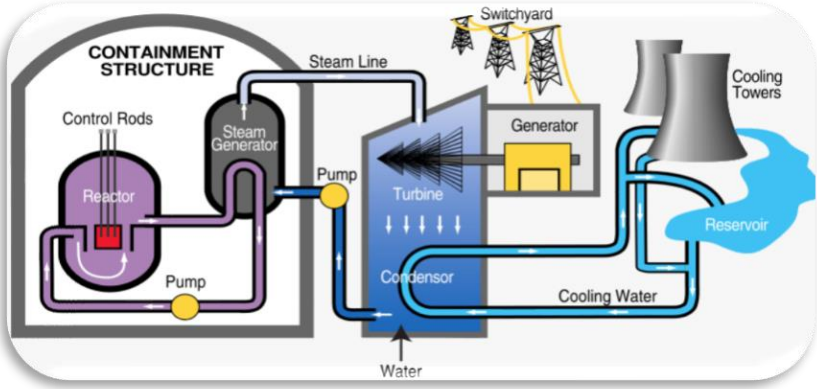

Nuclear Power Generation

Message from Vice Chancellor

It is my utmost pleasure to welcome you all to Chittagong University of Engineering & Technology (CUET), which is a leading public university in Bangladesh, committed to focus on providing high quality academic programs in line with the international and regional needs and expectations.

I am happy to know that, Nuclear Engineering department fosters sustainable nuclear energy development by supporting existing and new nuclear programs. It builds indigenous capability in energy planning, analysis and nuclear information and knowledge management. It will also equip graduates with design, problem solving, research skill in nuclear engineering and will produce graduates who will be able to contribute substantially to academia, industry and the community.

Higher education is an important slice, it plays an important role in the well-being of the people and security against diseases, deprivations. So, we offer many programs at this department which attract professional recognitions through their emphasis on close working links with industry and other professions. The institutions' teaching and research are innovatively based on the smart use of emerging technologies.

With our reputation as one of the most innovative and progressive educational institution in Bangladesh; our record of excellence in teaching and research, the dynamism and diversity of our student's community and a culture that fosters creativity, learning and academic exploration, CUET is a university with the energy and vision to make a real difference in the world.

Finally, I extend a cordial welcome to the students joining the university and wish them a very promising and successful professional career in the upcoming future.

(Prof. Dr. Mohammad Rafiqul Alam)
Vice-Chancellor

Message from Dean

The Nuclear Engineering is established to strive for excellence through the creation, preservation, transfer, and application of knowledge to her graduates. The engineering education in the Department of Nuclear Engineering, CUET is respected and valued for its research and education quality at both the national and international level. Along with an exceptional undergraduate program, here a substantial program is offered at the postgraduate level aimed at meeting the needs of industries and thus contributing to the economic growth of the country.

The main objectives of this department are to maintain a high standard of nuclear engineering education through excellent teaching-learning and innovative curricula that reflect the changing needs of the society, demonstrate and disseminate research outcomes through publications and undertake collaborative research to create opportunities for long term interaction with academia and industries. The department's state of the art facilities and instrumentation provide the support tools for comprehensive educational and research activities. The course curriculum is updated regularly to provide quality education and moral values and to cope with the recent advancement in the field of engineering.

Prof. Dr. Sunil Dhar
Dean

Message from the Head

In Bangladesh Engineering graduates coming out of the universities have a bright prospect in energy sector especially nuclear energy because it is the most important required in gradient to alleviate poverty, realize socio-economic and human development. Engineering graduates are participating on this research on nuclear energy. The Department of Nuclear Engineering is established to strive for excellence through the creation, preservation, transfer, and application of knowledge to her graduates.

The main objectives of this Department of Nuclear Engineering are to maintain a high standard of nuclear engineering education through excellent teaching-learning and innovative curricula that reflect the changing needs of the society, demonstrate and disseminate research outcomes through publications and undertake collaborative research to create opportunities for long term interaction with academia and industries.

To promote and provide facilities for advanced studies and research work on nuclear engineering for M.Sc. Engg. / M. Engg. and Ph. D., degree, training and post-doctoral researches (phase wise) is one of the main objectives of this department. The Nuclear Engineering Department offers programs that provide individuals opportunities to learn skills that will support to earn knowledge about the nuclear power generation, nuclear medicine, nuclear food preservation, R&D of Agricultural sectors, construction and general workforce industries.

Prof. Dr. Md Tazul Islam
Head

General Information

Introduction: Chittagong University of Engineering & Technology (CUET) is one of the prominent and leading, autonomous self-degree awarding university of Bangladesh in the field of engineering and technological education. The University has a beautiful hill side land of about 171 acres with a panoramic natural view. CUET is a reputed university where knowledge meets achievement, history meets future and ambition meets inspiration.

Historical Background: Chittagong University of Engineering and Technology is a public university situated in Capital city Chittagong, Bangladesh. It is playing a vital role for higher education, research and development in the engineering sector and applied sciences. Magnificent natural beauty is the main ornament of CUET. Due to increasing demand of professional engineers for the development of the nation. In 1968 the Chittagong Engineering college was started its journey under the Faculty of Engineering, University of Chittagong. In 1986: The college was declared as a self-degree-awarding institution and was renamed as "Bangladesh Institute of Technology" (BIT). In 2003: Finally, the institution was converted into a university for enlarging the engineering education and was named as Chittagong University of Engineering & Technology (CUET), under the CUET Act. 2003.

Administration: The Vice Chancellor is the chief executive officer of the university. The Honorable president of the People's Republic of Bangladesh is the chancellor of the university. The syndicate is the principle executive body of the university and currently it consists of 16 Syndicate Members. The Academic Council, the Finance committee, the Director of research and Extension, the Director of Students Welfare and the Planning & Development Committee etc. assist the syndicate. The Academic Council, comprising the faculty of the university and the other external members, is the apex educational body of the University.

CUET- At a Glance: The university has five faculties with fifteen teaching departments, three institutes, five centers and five halls. Lists of them are given below.

FACULTIES	
Faculty of Civil Engineering	
Departments	**Degree Offered**
Civil Engineering	Under & Post graduate
Water Resources Engineering	Undergraduate
Disaster & Environmental Engineering	Postgraduate
Faculty of Mechanical Engineering	
Departments	**Degree Offered**
Mechanical Engineering	Under & Post graduate
Petroleum and Mining Engineering	Undergraduate
Mechatronics and Industrial Engineering	Undergraduate
Faculty of Electrical and Computer Engineering	
Departments	**Degree Offered**
Electrical and Electronics Engineering	Under & Post graduate
Computer Science and Engineering	Under & Post graduate
Electronics & Telecommunication Engineering	Undergraduate
Biomedical Engineering	Undergraduate
Faculty of Architecture & Planning	
Departments	**Degree Offered**
Architecture	Undergraduate
Urban & Regional Planning	Under & Post graduate
Humanities	
Faculty of Engineering & Technology	
Departments	**Degree Offered**
Physics	Postgraduate
Mathematics	Postgraduate
Chemistry	Postgraduate
Material Science and Engineering	Undergraduate
Nuclear Engineering	Postgraduate
INSTITUTES	**Degree Offered**
Energy Technology	Postgraduate
Earthquake and Engineering Research	Postgraduate
Information & Communication Technology	Postgraduate
CENTERS	**Degree Offered**
Environmental Science & Engineering Research	
River, Harbor and Landside Research	Postgraduate
Industrial Problems Research	
Climate Change Application Research	

Department of Nuclear Engineering

Introduction: In accordance with as Chittagong University of Engineering & Technology, CUET Act. 2003. CUET has established the Department of Nuclear Engineering (NE) in February 2019 under the faculty of Engineering & Technology with view to supporting and promoting the country's nuclear programs. It is believed that the introduction of nuclear power programs and successful implementation of such project may help attaining energy security in Bangladesh. Even after due consideration to justifiable safety issues associated with commercial nuclear power reactors operating since 1950s, nuclear energy is being recognized as a reliable, environmentally sustainable and economically viable source of electricity generation. Nuclear energy is a source of green and carbon free energy. Calorific value of nuclear fuel is higher than others fuels.

The core objective of this Nuclear Engineering department is to make positive impact in nation's energy sustainability and preservation of bio-diversity. For which the mission of this department is to accomplish relevant and suitable research projects independently as well as in cooperation with private and public organizations at home and abroad.

Vision of ICT Incubator is Sustainable Development & Proliferation of IT/Hi-Tech Industry in Bangladesh. **Mission of ICT Incubator** is to Establish international standard infrastructure; create congenial & sustainable business environment; develop IT/ITES based Industrial ecosystem and ensure all services for IT/ITES business & industries through One Stop Platform.

Objectives: Following are the objectives of the department of NE, CUET

- Engage the expertise of faculty members from engineering and science departments, and promote nuclear engineering education by offering theory and practical courses, workshops and seminars;

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- Engage the expertise of faculty members from engineering and science departments, and promote nuclear engineering education by offering theory and practical courses, workshops and seminars;
- Contribute to enhancing nuclear engineering education and training of engineers and relevant professionals to be involved in the implementation of nuclear power program of the country;
- Provide expanded opportunities for CUET to offer degrees and professional certificate courses in nuclear engineering so as to facilitate successful implementation the nuclear power program of the country;
- Engage in nuclear power policy formulation, and innovations of new tools and devices;
- Development of computational tools for nuclear power, safety and security; create new knowledge through R&D

Vision: The vision of the Nuclear Engineering Department of the Chittagong University of Engineering and Technology is to be recognized as an excellent higher-education nuclear engineering institution in the global arena for effective and peaceful applications of nuclear energy

Mission: The missions of the Nuclear Engineering Department are:

- Development of computational tools for nuclear power, safety and security; create new knowledge through R&D
- To develop high quality nuclear engineers from undergraduate through the doctorate level who are capable of contributing valuable engineering skills and knowledge toward the design, building and running of Bangladesh's nuclear power plants.
- To become a center of excellence for providing education, research, and outreach in the field of nuclear engineering & technology as well as rendering technical support to lead Bangladesh's effort to develop its nuclear infrastructure and to introduce nuclear power program as a part of its energy mix.
- To perform services for industry, government, professional organizations, and the public in areas related to nuclear and radiological engineering.

Research Laboratory: The Department of Nuclear Engineering has tried to establish a well-equipped simulation Super Computer Lab for the students and faculty members, where reactor simulators like MCNP, Open MC, DRAJON, GEANT4, PHITS, Serpent, TRIPOLI-4, CASMO5, HELIOS-2, MPACT and SCALE etc. are available and working well. These codes are well known around the world and they are also used in commercial sectors. Department of Nuclear Engineering has a Sample Preparation Lab (High Temperature Muffle Furnaces, Portable Dose Rate Meter, Agate Mortar & Pestle Machine, Digital Radon Monitor, Digital Gas Detector, Organic & inorganic Chemicals etc.) In order to ensure better research facilities and environment, establishment of relevant laboratory facilities is under progress.

Access to External Facilities: The faculties and associated laboratories of CUET would be utilized for education, research, training and professional services. Department of Nuclear engineering, CUET has collaboration with Bangladesh Atomic Energy Commission **(BAEC)**, The TRIGA Mark-II Research Reactor, Tandem Accelerator and other facilities of BAEC may be explored for research and training. Moreover, NE department, CUET try to get strategic support and technical cooperation in academic research and development from International Atomic Energy Agency (IAEA) as a member state. Presently, skill faculties from the Department of Mechanical Engineering, Physics & Mathematics of CUET and nuclear energy experts from BAEC, University of Dhaka & MIST are agreed to take courses on Nuclear Engineering.

Training and Tours: Training courses will be customized in content and time to specific needs, covering technology items (Nuclear Safety and Security, Engineering and Design, Thermal Hydraulics Analyses, Instrumentation and Controls, Project Management, Licensing etc.). Besides this type of training program,

department can arrange study tours in different reputed organizations such as, Rooppur Nuclear Power Plant, Kaptai hydro-electric power plant, Raozan thermal power plant, Moheskali coal-based power plant, BAEC Bangladesh, etc. Workshop and Training program on Risk Management of nuclear energy will be organized by the department of Nuclear Engineering with the help of international Nuclear Specialists (IAEA).

Bureau of Research Testing and Consultancy: Expert services will be offered in collaboration with national and international partners. The Department of Nuclear Engineering may play vital role for providing TSO (Technical Support Organization) services both to the nuclear operators as well as to the regulators.

Co-Curricular Activities: The Department of Nuclear Engineering in CUET maintains a peaceful social life. Many social functions like welcome ceremony for fresher and farewell ceremony for out-going students, specific short courses, workshops, modular trainings, seminars etc. will be organized periodically.

CUET has some Co-curricular Organizations such as CUET Career Club (Objective is to build a prosperous career for the students and to give them leadership skills), CUET DS (Debating Society), RMA (Robo Mechatronics Association, CUET), GP (Green For Peace – an Environmental Organization), CUET Computer Club, JOYODDHONEY (a Nonpolitical Cultural Organization), CUET Sports Club, ASRRO (Andromeda Space & Robotics Research Organization) and CUET Photographic Society etc.

Research & Publications: The faculty members of the department have engaged in different research activities such as nuclear energy, reactor technology, energy conversion and harvesting, nuclear materials, nuclear medicines, nuclear safety and security, nuclear fuel fabrication, nuclear waste disposal, small modular reactor (SMR) and nano-technology, etc. The research fund is available under the Directorate of Research & Extension (DRE) of the University and Scholarship from UGC. The department have a plan to publish a journal (Journal on Nuclear Energy Technology) in the near future.

Faculty Members:

Head

Prof. Dr. Md. Tazul Islam
Ph.D. (BUET), M.Sc. (BUET), B.Sc. (BUET)
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Field of Interest: Fluid Mechanics & Machinery, Automobiles, Renewable Energy Refrigeration & Air Conditioning,

Lecturer

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M.Sc. in Nuclear Engineering (Moscow, Russia)
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Field of Interest: Design & safety of Reactor, Small Modular Reactor (SMR), SNF, Heat Transfer, Thermodynamics, Fluid Machinery etc.

Adjoint Faculty

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Field of Interest: Heat transfer, Renewable Energy

Prof. Dr. Md. Mahbubul Alam
Ph. D. (Japan), M. Engg. (Japan), B. Sc. Engg. (Mech.) (RUET), MIEB, MBSME
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Field of Interest: High Speed Aerodynamics, CFD, Renewable Energy

Prof. Dr. Sajal Chandra Banik
B.Sc. in ME (BUET), M.Sc. in Mechatronics (Germany), Ph.D. in Robotics & AI (Japan)
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Field of Interest: Machine learning and interaction, Logistic system Biorobots, Cognitive robots, Multiagent robotic system.

	**Prof. Dr. Md. Mohi Uddin** Ph.D (Japan) M. Phil. (CUET), M. Sc.(CU), B. Sc. (Hons)(CU) Email: mohi@cuet.ac.bd Contact: +88-01857-873871 **Field of Interest:** Solid State Quantum Transport, III-V QWFET, Quantum Hall Effect, Resistively Detected NMR, Magnetic Materials, DFT
	**Prof. Dr. Ujjwal Kumar Deb** Ph.D. (Mathematics), (Received: SC STAR Award), Mahidol University, Thailand, M.Sc. (Applied Mathematics), 1st class (2nd), CU, B.Sc. (Hons), 1st class (4th), CU Email: ukdebmath@cuet.ac.bd Contact: +88-01713109865 **Field of Interest:** Computational Fluid Dynamics, Finite Element Method, Mathematical Modeling and Simulation, Renewable Energy, Climate Chaos.
	**Prof. DR. NUR MOHAMMAD** Ph.D. in Power System Economics, Demand Response, M.Sc. and B.Sc. Engg. in EEE Email: nur.mohammad@cuet.ac.bd Contact: +88-01710610152 **Field of Interest:** Smart Grid Management, Application of IoT in Power Systems, Smart Metering and Pricing, Power Systems Simulation, Bi-level Optimization, Mathematical Problem with Equilibrium Constraint (MPEC), Game Theory.
	**DR. MD. MUKTER HOSSAIN** ***Assistant Professor*** B.Sc. (Hons)(RU), M.Sc. in Physics (RU), Ph.D. in Materials Science (Japan) Email: mukter_phy@cuet.ac.bd Contact: 01793-513837 **Field of Interest:** Materials science (Crystal growth), Condensed matter physics (Computational Materials Science)

Faculty Staffs:

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Senior Office Attendant	
	**Md. Muzibur Rahman** Contact: +88-01866775198

Syllabus for the Post-Graduate Program under

Department of Nuclear Engineering

[M.Sc.Engg.(NE)/M.Engg.(NE)/Ph.D (NE) Degree]

Syllabus for the Post-Graduate Program under Department of Nuclear Engineering

[M.Sc.Engg.(NE)/M.Engg.(NE)/Ph.D (NE) Degree]

The post graduate students of the Department of Nuclear Engineering have to follow the courses schedule below. The letter prefix in any course number indicates the department offering the course viz. NE for Nuclear Engineering. Each course offered by the department has a four-digit number with prefix NE which stands for name of the department. The first digit indicates the level of the courses (6 for M.Sc. / M. Engineering)

Course Code: NE- 6000

Course Title: Thesis/ Project

Credit: 6 / 18 / 45

3 Contact hours / Week

Course Code: NE- 6101

Course Title: Nuclear Power Plant Engineering

Credit: *3*

3 Contact hours / Week

History, Nuclear Energy Overview, Current Nuclear Power Plants, Reactor Coolant System, Safety Issues, Power Conversion and Auxiliary Systems, Thermodynamic Analysis of Nuclear Power Plant: Mathematical Modeling, Rankine Cycle, Brayton Cycle**;** Non-steady Flow Analysis: Containment Pressurization Process, Pressurizer to Load Changes; Power Systems Analysis and Protection, Electrical Load Flow Analysis, Power Plant Economics.

Reference Books:

(1) Todreas, N.E. and M.S. Kazimi,

(2) Nuclear Systems Vol. I, Hemisphere,1990

Course Code: NE 6102

Course Title: Advanced Mathematical & Numerical Methods

Credit: 3

3 Contact hours / Week

System of Linear Algebraic Equations, Power Series Solution, Special

Functions; Bessel Functions; Legendre Polynomials; Laplace and Inverse Laplace Transforms, Solution of Linear Differential Equations by Laplace Transform; Eigenvalues and Eigenvectors, Numerical Analysis: Interpolation, Differentiation and Integration; Solution of Ordinary Differential Equations (ODE) and Partial Differential Equations (PDE), Discrete Transform Methods: Fourier Series, Application of Discrete Fourier Series, Finite Element Method**;** Mathematical Modeling to Solve Problems Related Nuclear Reactor Applications**;** Programming: C/C++, Python, FORTRAN, MATLAB.

Reference Books:

(1) Perviz Moin, Fundamentals of Engineering Numerical Analysis, 2nd Edition, Cambridge

(2) Chapra, Numerical Methods for Engineering & Scientist

Course Code: NE- 6103
Course Title: Nuclear and Reactor Physics
Credit: 3
3 Contact hour / Week

Neutron Interaction and Nuclear Reactions, Reactor Statics: Multiplication Factor and Criticality, Neutron Flux Distribution, Four and Six Factor Formula; Reactor Shielding and Radiation Protection; Reactor Dynamics: Kinetics, Reactor Control and Plant Dynamics, Fission Product Poisoning; Neutron Transport and Diffusion Approximation; Nuclear Physics Bases of Reactor Design and its Relationship to Reactor Engineering Problems.

Reference Books:

(1) Lamarsh, J.R., **Introduction to Nuclear Reactor Theory**, ANS, 2002.

(2) Ott, K.O. and W.A. Bazella, **Introductory Nuclear Reactor Statics**, American Nuclear Society.

(3) Glasstone, S. and A. Sesonske, **Nuclear Reactor Engineering**, D Van Nostrand

Course Code: NE- 6104
Course Title: Nuclear Thermal Hydraulics & Safety Analysis
Credit: 3
3 Contact hour / Week

Nuclear Reactor Systems, Reactor Heat Transport, Reactor Safety Assessment, Probabilistic Safety Analysis, Deterministic Safety Analysis, Design Basis Accidents Analysis, Thermal Hydraulic Codes Utilizations: RELAP (Reactor Excursion and Leak Analysis Program), Multi-Physics CFD Codes; Two Phase Flow Modeling and Analysis, Code Verification and Validation, Overview of Worldwide Integral Effect Test Facilities.

Reference Books:

(1) Todreas, N.E. and M.S. Kazimi, **Nuclear Systems Vol. I**, Hemisphere, 1990.

(2) T.J. Thompson, J.G. **The Technology of Nuclear Reactor Safety Vol. 1&2**, Beckerley, 1964.

Course Code: NE- 6105
Course Title: Nuclear Reactor Materials
Credit: 3
3 Contact hour / Week

Overview of Nuclear Reactor System and Material Selection Bases, Fundamental Nature of Materials, Mechanical Properties of Materials, Stress Analysis, Radiation Effects in Materials, Corrosion of Metals, Fuel Materials, Cladding, Moderator and Coolant Materials, Materials for Control Rods, Structural and Reflector Materials and their Physical and Mechanical Properties, Fabrication of Fuel Rods and other Reactor Components. Fundamental of Radiation Damage, Dislocation Theories, Properties of Materials, Radiation Effects on Materials, Nuclear Fuels.

Reference Books:

(1) K. Linga Murty and Indrajit Charit, **An Introduction to Nuclear Materials: Fundamentals and Applications**, Wiley, 2012.

(2) Benjamin M. Ma, **Nuclear Reactor Materials and Applications**, Springer, 1982.,

(3) J. T. A. Roberts, **Structural Materials in Nuclear Power Systems**, Plenum Press.

Course Code: NE- 6106
Course Title: Nuclear Reactor and System Design
Credit: 3
3 Contact hour / Week

Nuclear and Reactor Physics, Nuclear Reactor Systems Thermodynamics and Hydrodynamics, Nuclear Systems Engineering, Nuclear Design, Thermal Design, Hydraulic Design, Mechanical Design; Seismic Aspect Consideration, Design Limitations and Criteria, Defense-in-Depth, Criteria for Sitting NPP, Deterministic and Probabilistic Safety Analysis, Computer Aided Design, Plant Virtual Modeling.

Reference Books:

(1) Todreas, N.E. and M.S. Kazimi, **Nuclear Systems Vol. I**, Hemisphere, 1990.
(2) C.D.G. King, **Nuclear Power Systems**, 1964
(3) T.J. Thompson, J.G. Beckerley, **The Technology of Nuclear Reactor Safety**, Vol. 1&2, 1964.

Course Code: NE 6107
Course Title: Nuclear Fuel Cycle & Waste Management
Credit: 3
3 Contact hours / Week

Nuclear Fuel Cycle: Overview, Brief Analysis Model, International Programs, Fuel Cycle Options, Comparison of Fuel Cycle Options; Uranium Fuel Supply, Uranium Enrichment, Fuel Design, Waste Management: Radionuclide Characteristics, Waste Types, Waste Treatment, Storage, Transport, Final Waste Disposal; Design of a Waste Processing Facility, Environmental Pollution and Protection; Conversion of Hazardous Long-lived Isotopes to Non-radioactive or Short-lived Isotopes, Management of Nuclear Accident and Disaster; Radiological Safety of Spent Nuclear Fuel (SNF) Repository, Environmental and Economic Analysis.

Reference Books:

(1) **World survey of SNFHLW Management, Disposition of HLW/SNF**, US National Research Council, 2001.
(2) R. Rechard, **WIPP History**,
(3) OECD, **Advanced Nuclear Fuel Cycles and Waste Management: Nuclear Development**

Course Code: NE 6108
Course Title: Nuclear Instrumentation and Control
Credit: 3
3 Contact hour / Week

Basics of Nuclear Electronics: Basic components of power electronics, BJT, MOSFET, Operational amplifier, Logic gates, nuclear counting systems, preamplifier, timer, counter, single channel analyzer, Multi-Channel Analyzer, Testing equipment, fault diagnosis of power supply, IC circuits and troubleshooting of nuclear equipment.

Nuclear measuring Instrument: Pulse generator, function generators, Use of Oscilloscope, photomultiplier, measurement of noise, monitoring and measuring of temperature, pressure, level, flow, position and radiation, radiation detectors, gas filled detector, Ionization chamber, proportional counter, Geiger Muller counter, Scintillation detectors, Cadmium Telluride Detectors, Gamma detectors. Analytical Nuclear Instrumentation: Radiation dose meter, Radiation Scintillation survey meter, area radiation monitor, Digital soil P^H meter, magnetic field detector.

Control systems: Categorization of Instrumentation & control (I & C) systems, important to safety, control hierarchy, subsidiary units, piping and instrumentation diagram of different types of nuclear power plant, nuclear reactor control system, component theory and design, control theory, allied instrumentation and control, system hardware and integrated operation.

Reference Books:

(1) Norman S. Nise, **Control Systems Engineering**, 6th Edition.

(2) Nuclear Power Plant Instrumentation and Control- A Guidebook, IAEA.

(3) Hashemian, H.M.**Maintenance of Process Instrumentation in Nuclear Power Plants**

Course Code: NE 6109
Course Title: Fusion and First Reactor Technology
Credit: 3
3 Contact hour / Week

Engineering and Design of Fusion Systems; Introduction to Controlled Thermonuclear Fusion as an Energy Economy; Case Studies of Fusion Reactor Design; Engineering Principles of Support Technology for Fusion Systems, Explosion and Implosion, Laser Fusion, Tokamaks, ITER (International Thermonuclear Experimental Reactor); First Reactor Technology: Core and Fuel Elements, Components and Systems, Thermal Hydraulic and Safety, Instrumentation and Control System, Design and Analysis.

Reference Books:

(1) **Technical Reports on First Reactor Technology**, GEN. IV, IFR, IAEA
(2) Michel Claessens, **The Gaint Fusion Reactor**, Springer

Course Code: NE 6110
Course Title: Nuclear Radiation and Health Physics
Credit: 3
3 Contact hour / Week

Interaction of Radiation with Matter; Physical, Chemical, and Biological Effects of Radiation on Human Tissues; Dosimetry Units and Measurements; Internal and External Radiation Fields and Dosimetry; Radiation Exposure Regulations; Radiation Protection Justification (Benefit vs. Risk) and Optimization; Sources of Radiation and Radioactivity; Basic Shielding Concepts; Elements of Radiation Protection and Control; Nuclear Medical Applications: Symptom and Detections, Diagnosis, Treatment; Theories and Models for Cell Survival, Radiation Sensitivity, Carcinogenesis and Dose Calculation.

Reference Books:

(1) **Herman Chamber**, Introduction to health physis
(2) **Radiation Safety Standards. IAEA**,

Course Code: NE 6111
Course Title: Research Reactor and Accelerator Laboratory
Credit: 1.5
3 Contact hour / Week

To Gain Deeper Understanding in Nuclear Science and its Engineering Applications by Utilizing Nuclear Research Reactor and Accelerator, Specially in Operation and Maintenance Under the Guidance of Experienced Operators and Experts.

Facilities: TRIGA MARK II Nuclear Research Reactor and Accelerator, BAEC.

Academic Rules and Regulations for the Post-Graduate Studies

ACADEMIC RULES & REGULATIONS FOR THE POST GRADUATE STUDIES
[Effective from Session 2014- 15 and onwards]

Approved by the Syndicate, Vide its Meeting No. ---, Date: ----

Definitions:
In this Rules & Regulations, unless the context otherwise requires:

(a) "Academic Council" means the Academic Council of the University;

(b) "ACPGS" means Academic Committee for the Post-Graduate Studies of the respective departments;

(c) "ACRS" means Academic Committee for Research and Studies of the respective Institutes;

(d) "CHSR" means the Committee for Higher Studies and Research;

(e) "Controller" means the Controller of Examinations of the University;

(f) "Dean" means the Head of a Faculty of the University;

(g) "Department" means the Concerned Academic Department of the University;

(h) "Director" means the Director of the Institute;

(i) "Equivalence Committee" means the Equivalence Committee for determining the equivalence of undergraduate and postgraduate degrees;

(j) "Head" means the Head of the Academic Department;

(k) "Institute" means the Concerned Academic and Research Institute of the University

(l) "Registrar" means the Registrar of the University;

(m) "Rules & Regulations" means Academic Rules & Regulations for the Post-Graduate Studies;

(n) "Syndicate" means the Syndicate of the University;

(o) "Term/Semester" means program of study to be completed within a specific period of time, generally six months.

(p) "University" means the Chittagong University of Engineering & Technology, abbreviated as CUET;

(q) "Vice-Chancellor" means the Vice-Chancellor of the University;

1.0 Committees:

1.1 There shall be a Committee for Higher Studies and Research (CHSR), constituted as per provisions of the Section-10 of the First Statues of the University, consisting of the following members;

(i)	Vice-Chancellor or his/her nominated person	Chairman
(ii)	Deans of the Faculties	Members
(iii)	Director of the Institutes	Members
(iv)	Heads of the Departments	Members
(v)	One eminent Engineer to be nominated by the Vice-Chancellor	Member
(vi)	One Professor from any other University to be nominated by the Academic Council	Member
(vii)	Director (Research and Extension)	Member Secretary

Approval of the Academic Council is to be taken before the committee is made operative. The term of the nominated member shall be three years. The nominated member shall continue to act as a member till a substitute is nominated. In case of vacancy the Vice-Chancellor will take appropriate action. Presence of more than 50% of members will form quorum. This Committee shall organize, co-ordinate, supervise and give directions to the Higher Studies and Research Programs to be conducted by the University through Academic Committee for Post-Graduate Studies (ACPGS) of various Departments and Academic Committee for Research and Studies (ACRS) of different Institutes.

1.2 There shall be another Committee named as the Academic Committee for the Post-Graduate Studies (ACPGS) in each Academic Department and as the Academic Committee for Research and Studies (ACRS) in each institute of the

University as constituted under Art 3(2) of the First Statues of the University.

1.3 The composition of the Academic Committee for the Post-Graduate Studies (ACPGS) is as follows:

(i)	The Head of the Department	Chairman
(ii)	All Teachers conducting the courses of M. Sc. Engg. / M. Engg. / M. Sc. / M. Phil / Ph. D.	Members
(iii)	All Professors and Associate Professors of the Department.	Members
(iv)	One Professor, to be nominated by the Vice-Chancellor, from amongst the Professors concerned associated with the subject from any other University.	Member
(v)	One expert in the subject actively associated with an organization of Commerce and Industries or Research, to be nominated by the Academic Council.	Member

Approval of the Academic Council is to be taken before the committee is made operative. A teacher may be nominated by the Head of the Department as Course Coordinator, who will be acting as Member Secretary of the Committee. Presence of more than 50% of members will form quorum.

1.4 The Academic Committee for Post-Graduate Studies (ACPGS) shall have following functions:

(i) To formulate the courses and syllabuses to award M. Sc. Engg. / M. Engg, M. Sc., M. Phil and Ph. D. degrees;

(ii) To propose the names of paper setters and examiners for different post-Graduate examinations to the Academic Council; and

(iii) To perform such other functions as may be conferred on it by CHSR, Faculty and Academic Council according to the provisions of Statutes and Rules.

1.5 The composition of the Academic Committee for Research and Studies (ACRS) of Institutes shall be as follows:

(i)	The Director of the Institute	Chairman
(ii)	All Teachers conducting the courses of Postgraduate Degree	Members
(iii)	All Professors and Associate Professors of the Institute.	Members
(iv)	One Professor, to be nominated by the Vice-Chancellor, from amongst the Professors concerned associated with the subject from any other University.	Member
(v)	One expert in the Subject actively associated with an organization of Commerce and Industries or Research, to be nominated by the Academic Council.	Member

Approval of the Academic Council is to be taken before the committee is made operative. The postgraduate course coordinator will act as the Secretary of the Committee. Presence of more than 50% of members will form quorum.

1.6 The Academic Committee for Research and Studies shall have following functions:

(i) To formulate the courses and syllabuses to award M. Sc. Engg. / M. Engg, M. Phil and Ph. D. degrees;

(ii) To propose the names of paper setters and examiners for different post-Graduate examinations to the Academic Council and

(iii) To perform such other functions as may be conferred on it by CHSR, Faculty and Academic Council according to the provisions of Statutes and Rules.

1.7 There shall be an Equivalence Committee for determining the equivalence of undergraduate/post-graduate degree consisting of the following members:

(i)	Vice-Chancellor or his/her nominated person	Chairman
(ii)	All Deans of the Faculties	Members
(iii)	Director of the Institute concerned	Member
(iv)	Head of the Department concerned	Member
(v)	One Professor from any other University to be nominated by the Vice-Chancellor	Member
(vi)	Controller of Examinations	Member Secretary

Approval of the Academic Council is to be taken before the committee is made operative.

Quorum: Simple majority will form quorum.

A. ACADEMIC RULES & REGULATIONS FOR THE MASTER'S DEGREE PROGRAM (M. Sc. Engg. and M. Engg.)

1.0 Degree Offered:

The postgraduate degrees to be offered under this ordinance are as follows:

1.1 **Master of Science in**

Civil Engineering	abbreviated as	M. Sc. Engg. (Civil)
Computer Science and Engineering	abbreviated as	M. Sc. Engg. (CSE)
Electrical & Electronic Engineering	abbreviated as	M. Sc. Engg. (EEE)
Mechanical Engineering	abbreviated as	M. Sc. Engg.(Mech)
Disaster and Environmental Engineering	abbreviated as	M. Sc. Engg. (DEE)
Energy Technology	abbreviated as	M. Sc. Engg. (ET)
Earthquake Engineering	abbreviated as	M. Sc. Engg. (EQE)
Physics	abbreviated as	M. Sc. (Phy)
Chemistry	abbreviated as	M. Sc. (Chem)
Mathematics	abbreviated as	M. Sc. (Math)

Any other degree that may be awarded by a department/institute on the approval of the Syndicate upon the recommendation of the Academic Council.

1.2 Master of Engineering in

Civil Engineering	abbreviated as	M. Engg. (Civil)
Computer Science and Engineering	abbreviated as	M. Engg. (CSE)
Electrical & Electronic Engineering	abbreviated as	M. Engg. (EEE)
Mechanical Engineering	abbreviated as	M. Engg. (Mech)
Energy Technology	abbreviated as	M. Engg. (ET)
Earthquake Engineering	abbreviated as	M. Engg. (EQE)

Any other degree that may be awarded by a department/institute on the approval of the Syndicate upon the recommendation of the Academic Council.

2.0 Admission Requirements:

2.1 For admission to the courses leading to a Master's degree (M. Sc. Engg. / M. Engg.), a candidate

a) must have at least one first class/first division or its equivalent in S. S. C. and H. S. C. examinations or its equivalent,

b) should have CGPA of a minimum of 2.50 out of 4.0 or its equivalent in B. Sc. Engg. in the relevant branch,

c) must not have third division or a CGPA less than 2.0 out of 5.0 in any one of S. S. C. and H. S. C. or equivalent examinations.

d) should submit a written research proposal.

2.2 For admission to the courses leading to the award of the degree of M. Sc. Engg. / M. Engg. in any branch, a candidate must have obtained a B. Sc. Engg. degree in the relevant branch or an equivalent degree from any recognized University/Institution. The Equivalence Committee shall examine the equivalence and suitability of a candidate for admission.

2.3 For admission to the courses leading to M. Sc. in Physics / Chemistry / Mathematics, an applicant

(a) must have at least 50% marks or a minimum CGPA of 2.5 out of 4.0 or its equivalent in four years B.S. / B. Sc. (Hons.)

(i) in Physics/ Applied Physics, Electronics and Communication Engineering, or B. Sc. Engg. in Electrical & Electronics / Materials & Metallurgical / Environmental Science / Environmental Science and Engineering or in a relevant discipline.

(ii) in Chemistry / Applied Chemistry / Biochemistry / Pharmacy or B. Sc. Engg. in Chemical / Environmental Chemistry / Environmental Science and Engineering or in a relevant discipline.

(iii) in Mathematics / Applied Mathematics / Physics / Statistics / Economics or B. Sc. Engineering in Civil / Electrical & Electronics / Mechanical / Computer Science and Engineering or in a relevant discipline,

Or

(b) must have at least second class or 50% marks or a minimum CGPA of 2.5 out of 4.0 or its equivalent in three years B. S. / B. Sc. (Hons.) or its equivalent and at least 50% marks or a minimum CGPA of 2.5 out of 4.0 or its equivalent in M.S. / M. Sc.

(i) in Physics / Applied Physics, Electronics and Communication Engineering, or in a relevant discipline.

(ii) in Chemistry / Applied Chemistry / Biochemistry / Pharmacy or in a relevant discipline.

(iii) in Mathematics / Applied Mathematics / Physics / Statistics / Economics or in a relevant discipline.

(c) must not have third division or a CGPA less than 2.0 out of 5.0 in any one of S. S. C. and H. S. C. or equivalent examinations.

d) should submit a written research proposal.

3.0 Admission Procedure:

3.1 Applications for admission to the above courses shall be invited through regular means of advertisement and shall be received by the Registrar office.

3.2 Before being finally selected for admission a candidate may be required to appear at an interview and / or admission test by an Admission Committee for the Postgraduate Studies as constituted by the CHSR. He/she will be required to take pre-requisite course as may be prescribed by the ACPGS/ACRS. Every selected candidate, unless he has already been registered, shall get himself/herself registered with the University.

3.3 After admission each student shall be assigned, by the respective ACPGS/ACRS of the department/institute, an Adviser/ Supervisor from among the teachers of the relevant Department/Institute not below the rank of an Assistant Professor having a post graduate degree. In advance of each enrolment and course registration for any Term/Semester the Adviser/Supervisor shall check and approve student's schedule for subjects, prerequisites as recommended by the ACPGS/ACRS and total credit hours. The student is expected to consult his/her adviser/supervisor on all academic problems but, it is the responsibility of the

individual student to see that his/her schedule conforms to the academic rules & regulations.

3.4 Every registered candidate shall get himself/herself enrolled on payment of prescribed fees and other dues as fixed by the University before the commencement of each semester/term. Course registration must be completed within two weeks from the start of the Term/Semester; otherwise, the student shall not be allowed to continue the course in the Term/Semester.

3.5 On the proposal of respective ACPGS of Departments/ ACRS of Institutes and upon the recommendation of the CHSR, the rules for admission into the University for postgraduate studies shall be framed/ reviewed time to time by the Academic Council.

4.0 Academic Requirements:

4.1 The minimum duration for full time students and part time students of the M. Sc. Engg., M. Engg. and M. Sc. shall normally be three and four terms/ semesters, respectively. There are two Terms/ Semesters in each academic year. The duration of each Term/Semester is generally six months including thirteen weeks of classes and the Term/ Semester final examination. A candidate for the Master's degree must complete all requirements for the degree within five academic years from the date of his first admission in the respective program.

4.2 Academic progress shall be measured in terms of credit hours earned by a student. One credit hour of a theory subject shall normally require one hour of class attendance per week for one Term/Semester; while one credit hour for thesis/project/laboratory should normally require three hours of work per week for one Term/Semester. The number of credit hours for each subject shall be as specified in the syllabus of the respective departments/institute.

4.3 (a) For awarding the degree of M. Sc. Engg. and M. Sc., a student must, in general, earn a minimum of 36 credit hours including a thesis for which 18 credit hours shall be assigned. However, for the department of Disaster and Environmental Engineering a student must earn a minimum of 48 credit hours including a thesis for which 21 credit hours shall be assigned.

(b) For awarding the degree of M. Engg., a student must earn a minimum of 36 credit hours including a project for which 6 credit hours shall be assigned.

4.4 There shall be two categories of students namely, full time students and part time students. Through the proper channel a student may apply to the respective Head/ Director to interchange his/her status between full time and part time studentship. Approval from the Academic Council is to be taken before the change is made operative. The status of studentship shall be reflected in his/her transcript.

4.5 Students, serving in organizations, including this University, may be admitted as part time students with a written consent of the employer. A part time student may be assigned a maximum of 9 credit hours of course work (theory course) in any Term/Semester. In case of Project/Thesis courses a maximum of 12 credit hours may be assigned for a part time student in any Term/Semester.

4.6 Full time students must register for a minimum of 12 credit hours and a maximum of 15 credit hours per Term/ Semester. A full-time student shall not be allowed to be in the employment of any organization (even as part time employee). However, they may be employed as Teaching Assistant/Research Assistant/ Research Associate at this University.

4.7 The subject(s) of study in the Department/ Institutes shall be proposed by the respective ACPGS/ACRS. Upon recommendation of CHSR the Academic Council of the University shall give the final approval after due consideration.

4.8 The courses to be offered in any term/ semester shall be as determined by the relevant Department/ Institute. The Department/ Institute may review the curriculum and courses from time to time and propose any change, as may be considered necessary to the CHSR.

5.0 Grading System:

5.1 Numerical marking may be made in answer scripts, tests etc., but all final grading to be reported to the Controller of Examinations shall be in the letter grade system as detailed below:

	Mark Range			Letter Grade	Grade Point
90%	and	above		A+	4.0
85%	to	below	90%	A	3.75
80%	to	below	85%	A-	3.5
75%	to	below	80%	B+	3.25
70%	to	below	75%	B	3.0
65%	to	below	70%	B-	2.75
60%	to	below	65%	C+	2.5
55%	to	below	60%	C	2.25
50%	to	below	55%	D	2.0
below		50%		F	0.0
				I	Incomplete
				S	Satisfactory
				U	Unsatisfactory
				W	Withdrawn

5.2 Course(s) in which the student gets 'F' grade shall not be counted towards credit hour requirements and for the calculation of Grade Point Average (GPA).

5.3 'I' grade shall be given only when a student is unable to sit for the examination of a course at the end of the semester because of circumstances beyond his/her control. He / She must apply to the Head of the concerned Department within one week after examination to get an 'I' grade in that course. It must be completed within the next two terms/semesters, otherwise; the grade becomes an 'F' grade. He / She may, however, be allowed to register without further payment of tuition fees for that course.

5.4 Satisfactory or Unsatisfactory will be used only as final grades for thesis/project and non-credit courses. Grade for thesis / projects "In Progress" shall be so recorded, when it is to be continued. If, however, thesis is discontinued, an 'I' Grade shall be recorded.

5.5 A student shall withdraw officially from a course within two working weeks of the commencement of the term / semester or else his/her grade in that course shall be recorded as 'F' unless he/she is eligible to get a grade of 'I'. A student may be permitted to withdraw and change his course within the specified period with the approval of his/her Adviser/ Supervisor and Head of the Department/Director of the Institute and the respective teacher(s) concerned.

6.0 Conduct of Examinations:

6.1 In addition to tests, assignments and/or examinations during the term/ semester as may be given by the teacher(s) concerned, there shall be a written final examination for each of the courses offered in a term/ semester at the end of that Term/ Semester. The dates of the final examination shall be announced by the Controller of Examinations, as advised by the Chairman of the Examination Committee at least two weeks before the commencement of the examination. The final grade in a subject shall be based on the performance in all tests, assignments and examinations.

6.2 The Controller of Examinations shall keep up to date record of all grades obtained by a student in individual Academic Record Card and also in the Tabulation Book. Grades shall be announced by the Controller of Examinations at the end of each Term/Semester. In addition, each student is entitled to get one official transcript of the University record without any fee at the completion of his/her academic program from the office of the Controller of Examinations on production of statement of clearance from all Departments/Institutes/Offices.

6.3 The Controller of Examinations shall prepare invigilation schedule and provide all logistic supports for holding the examinations. He shall receive examination answer scripts and distribute the same to the respective examiners with proper instructions.

6.4 The ACPGS/ACRS of the respective department/institute shall propose to the Academic Council for final approval of the names of the paper setters and examiners for the term/ semester final examinations of the courses at least two weeks before the date of commencement of the examination.

7.0 Qualifying Requirements:

7.1 The qualifying requirement for the degree of M. Sc. Engg. / M. Engg is that a student must earn a minimum grade point of 2.65 based on the weighted average in his/her course work.

7.2 The ‘D’ grades up to a maximum of one course may be ignored for calculation of Grade Point Average (GPA) at the written request of the student, provided the student has

completed the total course credit hour requirement with a minimum weighted GPA of 2.65 in the remaining subjects. No course(s) shall be repeated unless it is a compulsory requirement for the degree as determined by the CHSR. Performance in all the subjects shall be reflected in the transcript.

7.3 In addition to successful completion of course works every student shall submit a thesis on his/her research work or report on his/ her project work, fulfilling the requirements as detailed below.

8.0 Thesis:

8.1 Research work for a thesis shall be carried out under the supervision of a full-time teacher not below the rank of Assistant Professor with postgraduate degree belonging to the relevant Department/ Institute. Co-supervisor(s) from within or outside the department/institute may be appointed, if necessary.

8.2 The thesis proposal (as per the prescribed format) shall be proposed by the respective ACPGS/ACRS of the relevant Department/ Institute for final approval of the Academic Council upon the recommendation of CHSR of the university. The thesis proposal shall preferably be approved before the end of the second Term/Semester of studies of the student concern. If any change is necessary in the approved thesis proposal (title, content, cost, supervisor, co-supervisor etc.), it shall be submitted to the respective ACPGS/ ACRS of the Department/ Institute for final approval of the Academic Council upon the recommendation of the CHSR.

8.3 The research work shall be carried out in this University or at a place (s) approved by the Supervisor in consultation with the respective ACPGS/ ACRS of the Department/ Institute.

8.4 Every student through his/ her supervisor shall submit required number of computer composed copies of his/ her thesis in the approved format (As given in Appendix) to the Head of the Department or Director of the Institute. The Head of the Department/ Director of the Institute shall immediately send copies of the thesis to the Controller of Examinations. The Controller of Examinations shall send the same to all members of the Examination Board. Upon receipt of the written/ verbal consent, regarding the date of

the oral examination, of all members of the Examination Board, the Controller of Examinations shall arrange the oral examination in consultation with the Chairman of the Examination Board.

8.5 The student shall certify that the research work has been done by him/her and that this work has not been submitted elsewhere for any other purpose, except for publication.

8.6 The thesis should demonstrate/reflect evidence of satisfactory knowledge in the field of research undertaken by the student.

8.7 **Oral Examination**:

8.7.1 Every student, submitting a thesis in partial fulfilment of the requirements of a degree, shall be required to appear at an oral examination, on a date or dates fixed by the Controller of Examinations in consultation with the Chairman of the Examination Board.

8.7.2 Every student must satisfy the examiners that he/ she is capable of intelligently applying the results of this research to the solution of problems, of undertaking independent work, and also afford evidence of satisfactory knowledge related to the theory and technique used in his research work.

8.7.3 There shall be an Examination Board consisting of minimum four members for conducting oral examination for every M.Sc. Engg. and M. Sc. student. The Supervisor shall act as the Chairman and the Head of the Department / Director of the Institute will be an ex-officio member of the Examination Board.

The composition of the Examination Board shall be as follows:

i.	Supervisor	Chairman
ii.	Co-supervisor (s) (if any)	Member
iii.	Head of the Department/Director of the Institute (Ex-Officio)	Member
iv.	One or two teachers from within the Department/ Institute	Member
v.	One External member outside the student's Department/ Institute/University	Member (External)

The Examination Board shall be proposed by the respective ACPGS/ ACRS of the relevant Department/ Institute for final approval of Academic Council followed by the recommendation of CHSR.

Quorum: Presence of Supervisor, Head of the Department/ Director of the Institute and External Member shall form the quorum.

8.7.4 The Head of the Department/ Director of Institute will send the resolution taken by the Examination Board with his forwarding to the Controller of Examinations.

8.7.5 If any examiner is unable to accept the appointment or has to relinquish his appointment before the examination, the Vice-Chancellor shall appoint another examiner in his place, on suggestion from the Supervisor in consultation with the Head of the Department / Director of the Institute. This appointment will be reported to Academic Council.

8.8 Upon satisfactory completion of the oral examination, the student shall submit N+2, where N is the number of members of the Examination Board, hard copies of the corrected thesis as per the prescribed format and specification, duly certified by the Supervisor and Co- Supervisor (s) (if any) that all the corrections have been incorporated in the thesis as suggested by the Board of Examiners.

9.0 Project:

9.1 Project work shall be carried out under the supervision of a full-time teacher not below the rank of Assistant Professor with postgraduate degree belonging to the relevant Department/ Institute.

9.2 The project proposal (as per the prescribed format) shall be proposed by the respective ACPGS/ ACRS of the relevant Department/ Institute for final approval of Academic Council upon the recommendation of CHSR. The project proposal shall be preferably approved before the end of the second Term/ Semester of studies of the student concern. If any change is necessary in the approved project proposal (title, content, cost, supervisor, co-supervisor etc.), it shall be submitted to the respective ACPGS/ ACRS of the department/institute for final approval of Academic Council upon the recommendation of CHSR.

9.3 The project work must be carried out in this University or at a place approved by the supervisor in consultation with the Head of the Department/ Director of the Institute.

9.4 Every student through his/ her supervisor shall submit required number of computer composed copies of his/her thesis in the approved format (As given in Appendix) to the Head of the Department or Director of the Institute. The Head of the Department/ Director of the Institute shall send immediately copies of the thesis to the Controller of Examinations. The Controller of Examinations shall send the same to all members of the Examination Board. Upon receipt of the written/ verbal consent, regarding the date of the oral examination, of all members of the Examination Board, the Controller of Examinations shall arrange the oral examination in consultation with the Chairman of the Examination Board.

9.5 The student shall certify that the project work was done by him/her and that this work has not been submitted elsewhere or any other degree or diploma.

9.6 **Oral Examination:**

9.6.1 Every student submitting a project report in partial fulfilment of the requirements of a degree, shall be required to appear at an oral examination, on a date or dates fixed by the Controller of Examinations in consultation with the Chairman of the Examination Board.

9.6.2 Every student must satisfy the examiners that he/ she is capable of intelligently applying the results of this project to the solution of problems, of undertaking independent work, and also afford evidence of satisfactory knowledge related to the theory and technique used in his project work.

9.6.3 There shall be an Examination Board consisting of following members for conducting oral examination for every M. Engg. student. The Supervisor shall act as the Chairman and the Head of the Department will be an ex-officio member of the Examination Board. The Examination Board shall be proposed by the respective ACPGS/ ACRS of the relevant Department/ Institute for final approval of Academic

Council followed by the recommendation of the CHSR.

The composition of the Examination Board shall be as follows:

i.	Supervisor	Chairman
ii.	Head of the Department/Director of the Institute (Ex-Officio)	Member
iii.	One Teacher from within the Department/ Institute	Member
iv.	One External member outside the student's Department/ Institute / University	Member (External)

Quorum: Presence of Supervisor, Head of the Department/ Director of the Institute and External Member shall form the quorum.

9.6.4 The Head of the Department/ Director of the Institute will send the resolution taken by the Examination Board with his forwarding to the Controller of Examinations.

9.6.5 If any examiner is unable to accept the appointment or has to relinquish his appointment before the examination, the Vice-Chancellor shall appoint another examiner in his place, on suggestion from the Supervisor in consultation with the Head of the Department/ Director of the Institute. This appointment shall be reported to the Academic Council.

9.7 Upon satisfactory completion of the oral examination, the student shall submit N+2, where N is the number members of the Examination Board, hard copies of the corrected thesis as per prescribed format and specification, duly certified by the Supervisor and Co- Supervisor (if any) that all the corrections have been incorporated in the thesis as suggested by the Board of Examiners.

10.0 Striking off and Removal of Names from the Rolls:

The name of the student be struck off and removed from the rolls of the University for the following grounds:

(i) Non-payment of dues within prescribed period. Post graduate students residing in the halls of residence shall be subject to the same conditions or rules as followed in the Ordinance regarding Student's Discipline Rules.

(ii) Failing to proceed with the program by the exercise of Articles 4.1 and/or 7.1 or 7.3 of this Rules & Regulations.

(iii) Failing to make satisfactory progress in his program as reported by the Adviser/Supervisor through the ACPGS/ACRS and approved by the CHSR

(iv) Forced to discontinue his studies under disciplinary rules.

(v) Withdrawn officially from all the courses including Thesis/Project.

11.0 Publication of Results:

11.1 A student who successfully completes the prescribed courses and all academic requirements for fulfilment of the postgraduate degree will have to apply to the Controller of Examinations through the Head of the Department for the award of degree.

11.2 The Controller of Examinations shall publish the result.

11.3 Provisional degree will be awarded, on completion of minimum credit and GPA requirements, by the Academic Council.

12.0 Academic Fees:

Academic fees shall be as per Appendix-I and shall be reviewed and determined from time to time by the appropriate authority of the University.

13.0 Return of Fees:

A student withdrawing officially from all courses registered in a term / Semester including project/thesis as per Art. 10 (v) is entitled to get a refund of 50% of the course registration fees of the term / semester provided he/she withdraws in writing through the respective Head of the Department before the expiry of two working weeks from the commencement of the classes; and in that case his/her grade in the courses registered shall be recorded as 'W'. If withdrawal is made after the expiry of two weeks from the commencement of classes no refund shall be allowed and the grade should be recorded as 'F' unless he is eligible to get a grade of 'I' as per Art. 5.3. Thesis/Project registration fees in any case are not refundable.

B. ACADEMIC RULES & REGULATIONS FOR THE M. PHIL. DEGREE COURSES

1.0 Degree Offered:

The Post graduate degrees to be offered under this Ordinance are as follows:

1.1 **Master of Philosophy in**

Physics	abbreviated as	M. Phil. (Phy)
Mathematics	abbreviated as	M. Phil. (Math)
Chemistry	abbreviated as	M. Phil. (Chem)
Energy Technology	abbreviated as	M. Phil. (ET)

Any other degree that may be awarded by a department on the approval of the Syndicate upon the recommendation of the Academic Council

2.0 Admission Requirements:

2.1 **For admission to the courses leading to an M. Phil. degree a candidate:**

a) must have at least one first class/first division or its equivalent in S. S. C. and H. S. C. examinations,

b) should have as at least second class/ division or CGPA of a minimum of 2.50 out of 4.0 or its equivalent in four-years Bachelor's degree in the relevant field,

c) should have at least four years bachelor degree or equivalent degree in the relevant branches,

d) must not have third division/class in S. S. C. and H. S. C. examinations, and

e) should submit a written research proposal.

2.2 **For admission to the courses leading to an M. Phil. in IET a candidate:**

a) must have at least one first class/first division or its equivalent in S. S. C. and H. S. C. examinations,

b) should have at least CGPA of a minimum of 2.50 out of 4.0 or its equivalent in four-years Bachelor's degree in the relevant field,

c) should have at least four years Bachelor degree in Engg. / Physical Science / Social Science / Business Administration with minimum GPA 2.50 out of 4.0,

d) must not have a third division/class in S. S. C. and H.S.C. examinations, and

e) should submit written research proposal.

3.0 Admission procedures:

3.1 Applications for admission to the above courses shall be invited through regular means of advertisement and shall be received by the Registrar.

3.2 Before being finally selected for admission a candidate may be required to appear at an oral and / or written test by an Admission Committee for the Postgraduate Studies as constituted by the CHSR. He/she shall be required to take prerequisite non-credit courses as may be prescribed by the Admission Committee. Every selected candidate, unless he has already been registered, shall get himself/herself registered with the University.

3.3 After admission each candidate (student) shall be assigned, by the respective ACPGS/ACRS of the department/institute, an Adviser/ Supervisor from among the teachers of the relevant Department/Institute not below the rank of an Assistant Professor having a post graduate degree. In advance of each enrolment and course registration for any term/ semester the Adviser/Supervisor shall check and approve student's schedule for subjects, prerequisites as recommended by the ACPGS/ACRS and total credit hours. The student is expected to consult his/ her adviser/ supervisor on all academic problems but, it is the responsibility of the individual student to see that his/her schedule conforms to the academic rules & regulations.

3.4 Every registered student shall get himself/ herself enrolled on payment of prescribed fees and other dues before the commencement of each term / semester. In any academic year there will be normally two terms / semesters. The duration of each term/ semester is generally six months including thirteen weeks of classes and Term/ Semester final examination. All course registration must be completed

within two weeks from the start of a term / semester, otherwise, the student shall not be allowed to continue the course in that term / semester.

3.5 On the proposal of respective ACPGS/ACRS and upon the recommendation of the CHSR, the rules for admission into the University for Postgraduate Studies shall be framed from time to time by the Academic Council.

4.0 Academic Requirements and Regulations:

4.1 The minimum duration of the M. Phil. course shall normally be four terms / semesters. A candidate for the M. Phil. degree must complete all requirements for the degree within five academic years from the date of his/ her first admission in the respective program.

4.2 Academic progress shall be measured in terms of credit hours earned by a student. One credit hour course shall normally require one hour of class attendance per week for one term / semester; while one credit hour for thesis/laboratory work should normally require three hours of work per week for one term / semester. The number of credit hours for each subject shall be as specified in the syllabus of the respective Department/Institute.

4.3 For the degree of M. Phil. a student must earn a minimum of 48 credit hours including a thesis of 30 credit hours.

4.4 There shall be two categories of students namely, full-time students and part-time students. Through the proper channel a student may apply to the respective Head/ Director to interchange his/her status between full time and part time studentship. Approval from the Academic Council is to be taken before the change is made operative. The status of studentship shall be reflected in his/her transcript.

4.5 Students serving in different organizations may be admitted as part-time students with a written consent of the employer. A part time student may be assigned a maximum of 9 credit hours of theory course in any term / semester. In case of Thesis course, a maximum of 12 credit hours may be assigned for a part time student in any Term/Semester.

4.6 Full-time student must register for a minimum of 12 credit hours and a maximum of 15 credit hours per term /semester. A full-time student shall not be allowed to be in the employment of any organization (even as part time employee). However, they may be employed as

Teaching/Research Assistant or Research Associate at the University. If a full-time student becomes an employee (full or part time) of any other organization in the middle of a term / semester, he may, with the approval of the Head of the Department and his Employer, be allowed to continue as a full-time student for that semester.

4.7 The subjects of study in the Department/Institutes shall be proposed by the respective ACPGS/ACRS. Upon recommendation of CHSR the Academic Council of the University shall give the final approval after due consideration.

4.8 The courses to be offered in any term/ semester shall be as determined by the relevant department/institute. The Department/Institute may review the curriculum and courses from time to time and propose any change, as may be considered necessary to the CHSR.

5.0 Grading System:

5.1 Numerical marking may be made in answer scripts, tests etc., but all final grading to be reported to the Controller of Examinations shall be in the letter grade system as detailed below:

	Mark Range				Letter Grade	Grade Point
90%	and		above		A+	4.0
85%	to		below	90%	A	3.75
80%	to		below	85%	A-	3.5
75%	to		below	80%	B+	3.25
70%	to		below	75%	B	3.0
65%	to		below	70%	B-	2.75
60%	to		below	65%	C+	2.5
55%	to		below	60%	C	2.25
50%	to		below	55%	D	2.0
below			50%		F	0.0
					I	Incomplete
					S	Satisfactory
					U	Unsatisfactory
					W	Withdrawn

5.2 Courses in which the student gets 'F' grades shall not be counted towards credit hour requirements and for the calculation of Grade Point Average (GPA).

5.3 'I' Grade shall be given only when a student is unable to sit for the examination of a course at the end of the term / semester because of circumstances beyond his control, he must apply to the Head of the concerned Department within one week after the examination to get an 'I' grade in that course. It must be completed within the next two terms / semesters, otherwise, the 'I' become an 'F' grade. He/she may, however, be allowed to register without further payment of tuition fees for that course.

5.4 Satisfactory or Unsatisfactory- grades shall be used only as final grades for thesis and non-credit courses. Grade for thesis "In Progress" shall be so recorded what it is to be continued. If, however, thesis is discontinued, an 'I' grade shall be recorded.

5.5 A student shall withdraw officially from a course within two working weeks of the commencement of the term / semester or else his/her grade in that course shall be recorded as 'F' unless he/she is eligible to get a grade of 'I'. A student may be permitted to withdraw and change his course within the specified period with the approval of his/her Adviser, Head of the Department/Director of the Institute and the respective teacher(s) concerned.

6.0 Conduct of Examinations:

6.1 In addition to tests, assignments and/or examinations during the terms /semester as may be given by the teacher(s) concerned, there shall be a written examination for each of the courses offered in a Term / Semester at the end of that term / semester. The dates of the final examination shall be announced by the Controller of Examinations as advised by the Chairman of the Examination Committee at least two weeks before the commencement of the examination. The final grade in a course shall be based on the performance in all tests, assignments and /or any other examinations.

6.2 The Controller of Examinations shall keep up to-date record of all the grades obtained by a student in individual Academic Record Card. Grades shall be announced by the Controller of Examinations at the end of each term /

semester. In addition, each student is entitled to one official transcript of the University record without any fee at the completion of his academic program from the office of the Controller of Examinations on production of statement of clearance from all Departments/ Institutes/ Offices.

6.3 The Controller of Examinations shall prepare invigilation schedule and provide logistic support for holding the examinations. He shall receive examination answer scripts and distribute the same to the respective examiners with proper instructions.

6.4 The ACPGS/ACRS of the respective Department/ Institute shall propose and CHSR shall recommend the names of the paper setters and examiners for the term/ semester final examinations at least two weeks before the date of commencement of the examination to the Vice-Chancellor for approval.

7.0 Qualifying Requirements:

7.1 The qualifying requirement for graduation is that a student must earn the minimum grade point of 2.65 based on the weighted average in his/her course work.

7.2 The 'D' grades up to a maximum of two subjects may be ignored for calculation of Grade Point Average (GPA) at the written request of the student, provided the student has completed the total credit hour requirement with minimum weighted GPA of 2.65 in the remaining subjects. No course shall be repeated unless it is compulsory requirement for the degree as determined by the CHSR. Performance in all the subjects shall be reflected in the Transcript.

7.3 In addition to successful completion of course works every student shall submit a thesis on his/her research work, fulfilling the requirements as detailed below.

8.0 Thesis:

8.1 Research work for a thesis shall be carried out under the supervision of a full-time teacher not below the rank of Assistant Professor with postgraduate degree belonging to the relevant Department/ Institute. Co-supervisor(s) from within or outside the department/institute may be appointed, if necessary.

8.2 The thesis proposal (as per the prescribed format) shall be proposed by the respective ACPGS/ ACRS of the relevant

Department/ Institute for final approval of the Academic Council followed by the recommendation of CHSR. The thesis proposal shall be preferably approved before the end of the second term/ semester of studies of the student. If any change is necessary in the approved thesis proposal (title, content, cost, supervisor, co-supervisor etc.), it shall be submitted to the respective ACPGS/ACRS of the Department/ Institute for final approval of the Academic Council followed by the recommendation of CHSR.

8.3 The Research work must be carried out in this university or at place approved by the Supervisor in consultation with the ACPGS/ACRS.

8.4 Every student through his/ her supervisor shall submit required number of computer composed copies of his/ her thesis in the approved format (As given in Appendix) to the Head of the Department or Director of the Institute. The Head of the Department/ Director of the Institute shall immediately send copies of the thesis to the Controller of Examinations. The Controller of Examinations shall send the same to all members of the Examination Board. Upon receipt of the written/ verbal consent, regarding the date of the oral examination, of all members of the Examination Board, the Controller of Examinations shall arrange the oral examination in consultation with the Chairman of the Examination Board.

8.5 The student shall certify that the research work was done by him/her and that this work has not been submitted elsewhere for any other purpose (except for publication).

8.6 The thesis should demonstrate evidence of satisfactory knowledge in the field of research undertaken by the student.

8.7 Oral Examination:

8.7.1 Every student, submitting a thesis in partial fulfilment of the requirements of M. Phil. degree, shall be required to appear at an oral examination, on a date or dates fixed by the Controller of Examinations in consultation with the Chairman of the Examination Board.

8.7.2 Every student must satisfy the examiners that he/ she is capable of intelligently applying the results of this research to the solution of problems, of undertaking

independent work, and also afford evidence of satisfactory knowledge related to the theory and technique used in his research work.

8.7.3 There shall be an Examination Board consisting of minimum four members for conducting the oral examination for every M. Phil. student. The Supervisor shall act as the Chairman and the Head of the Department will be an ex-officio member of the Examination Board. The Examination Board shall be proposed by the respective ACPGS/ ACRS of the relevant Department/ Institute for final approval of Academic Council followed by the recommendation of CHSR.

The composition of the Examination Board shall be as follows:

i.	Supervisor	Chairman
ii.	Co-supervisor (s) (if any)	Member
iii.	Head of the Department/Director of Institute (Ex-Officio)	Member
iv.	One or two members from within the Department	Member
v.	One external member from outside the student's department/ University	Member (External)

Quorum: Presence of Supervisor, Head of the Department / Director of the Institute and External Member shall form the quorum

8.7.4 The Head of the Department/ Director of Institute will send the resolution taken by the Examination Board with his forwarding to the Controller of Examinations.

8.7.5 If any examiner is unable to accept the appointment or has to relinquish his appointment before the examination, the Vice-Chancellor shall appoint another examiner in his place, on suggestion from the Supervisor in consultation with the Head of the Department. This appointment will be reported to the CHSR.

8.8 Upon satisfactory completion of the oral examination, the student shall submit N+2, where N is the number members of the Examination Board, hard copies of the corrected thesis as per prescribed format and specification, duly certified by the Supervisor and Co- Supervisor (if any) that all the corrections have been incorporated in the thesis as suggested by the Board of Examiners.

9.0 Striking off and removal of names from the rolls:

The name of the student shall be struck off and removed from the rolls of the University on the following grounds:

(i) Non-payment of dues within the prescribed period. Post graduate students residing in the halls of residence shall be subject to the same conditions as followed in the Ordinance regarding student's Discipline.

(ii) Failing to proceed with the program by the exercise of Article 4.1 and or 7.1 and/or 7.3 this Rules & Regulations.

(iii) Failing to make satisfactory progress in his/her program as reported by the Adviser/Supervisor through the ACPGS/ACRS and approved by CHSR.

(iv) Forced to discontinue his studies under disciplinary rules.

(v) Withdrawn officially from all the courses including thesis.

10.0 Academic Fees:

Academic fees shall be as per Appendix-II It and shall be reviewed and determined from time to time by the appropriate authority of the University.

11.0 Publication of Results:

11.1 A student who successfully completes the prescribed courses and all academic requirements for fulfilment of the postgraduate degree will have to apply to the Controller of Examinations through the Head of the Department for the award of degree.

11.2 The Controller of Examinations shall publish the result.

11.3 Provisional degree will be awarded, on completion of minimum credit and CGPA requirements, by the Academic Council.

12.0 Return of Fees:

A student withdrawing officially from all courses registered in a term / semester (including project/thesis) as per Art. 9.0 (v) is entitled to get a refund of 50% of the course registration fees,

provided he/she withdraws in writing through the respective Head of the Department before the expiry of two working weeks from the commencement of the classes; and in that case his/her grade in the courses registered shall be recorded as 'W'. If withdrawal is made after the expiry of two weeks from the commencement of classes no refund shall be allowed and the grade should be recorded as failure, unless he is eligible to get a grade of "Incomplete" as per Art. 5.3 Thesis/Project registration fees in any case are not refundable.

C. ACADEMIC RULES & REGULATIONS FOR DOCTOR OF PHILOSOPHY PROGRAM

1.0 Degrees Offered:

The degree of Doctor of Philosophy shall be offered by the University in the following Departments/Institutes:

Department of Civil Engineering;

Department of Computer Science and Engineering;

Department of Electrical & Electronic Engineering;

Department of Mechanical Engineering;

Department of Physics;

Department of Chemistry;

Department of Mathematics;

Institute of Earthquake Engineering Research;

Such other Department/ Institute as may be approved by the Academic Council and the Syndicate of the University.

The degree of Doctor of Philosophy shall be abbreviated as Ph. D.

2.0 Admission Requirements:

2.1 For admission to the courses leading to a Ph. D. degree a candidate

a) must have at least one first class/first division or its equivalent in S. S. C. and H. S. C. examinations or its equivalent,

b) must have at least second class/ division or CGPA of a minimum of 2.50 out of 4.0 or its equivalent in four years B. Sc. (Hons.) / B. Sc. Engg. / in the relevant branch,

c) must have an M. Sc. Engg. / M. Engg / M. Sc. with four-year bachelor degree / M. Phil. degree with minimum grades as stated in the following sub-sections,

d) must not have third division/class or GPA of minimum 2.0 out of scale of 5.0 in S. S. C. and H. S. C. examinations, and

e) must submit a written research proposal in a prescribed format.

2.2 For engineering, the minimum qualification for admission shall normally be an M. Sc. Engg. / M. Engg. degree with a

minimum CGPA of 2.75 out of 4.0 in the relevant branch of engineering or its equivalent from any recognized Institution.

2.3 (a) For Physics, the minimum qualification for admission shall normally be an M.Sc with four-year B.Sc.(Hons.)./M.Phil. Degree in Physics / Applied Physics/Environmental Science with a minimum GPA of 2.75 out of 4.0 or its equivalent from any recognized Institution.

Or

M. Sc. Engg. degree in Mechanical/Electrical & Electronic Engineering/ Electronics & Telecommunication Engineering/Electronics and Communication Engineering / Computer Science & Engineering/ Materials & Metallurgical Engineering /Environmental Science and Engineering or in a relevant discipline with a minimum GPA of 2.75 out of 4.0 or its equivalent from any recognized Institution.

(b) For Chemistry, the minimum qualification for admission shall normally be an M.Sc with four-year B. Sc. (Hons.)./M. Phil. degree in Chemistry/Applied Chemistry/Biochemistry/Molecular Biology/Food and Nutrition /Environmental Chemistry with a minimum GPA of 2.75 out of 4.0 or its equivalent from any recognized Institution.

Or

M. Sc. Engg. degree in Chemical Engineering/ Environmental Science and Engineering or in a relevant Discipline with a minimum GPA of 2.75 out of 4.0 or its equivalent from any recognized Institution.

(c) For Mathematics, the minimum qualification for admission shall normally be an M. Sc. / M. Phil. degree in Mathematics/Applied Mathematics / Physics / Statistics / Economics with a minimum GPA of 2.75 out of 4.0 or its equivalent from any recognized Institution.

Or

M. Sc. Engg. degree in Civil / Electrical & Electronics / Mechanical / Computer Science and Engineering with a

minimum GPA of 2.75 out of 4.0 or its equivalent from any recognized Institution.

3.0 Admission Procedure:

3.1 Provisional Selection:

3.1.1 Applications for provisional admission to the Ph. D. program shall be received by the Registrar.

3.1.2 Before being provisionally selected for admission to the Ph. D. program a candidate may be required to appear at an oral and / or written test by an Admission Committee for the Postgraduate Studies as constituted by the CHSR.

3.1.3 A candidate provisionally selected by the Admission Committee may be required to pass the prerequisite non-credit courses as prescribed by the Admission Committee.

3.2 Final Selection:

A provisionally selected candidate shall be deemed to be eligible for final registration as a Ph. D. student with effect from the date of his provisional admission if and when he/ she qualifies the comprehensive examination (as per Art. 11.1.2).

4.0 Registration:

4.1 Every selected candidate, unless he/she has already been registered, shall get himself/herself registered with the University.

4.2 Every registered candidate (student) shall get himself/herself enrolled on payment of prescribed fees and other dues as per university rules before the commencement of each term/semester. Course registration must be completed within two weeks from the start of the term/semester; otherwise, the student shall not be allowed to continue the course in that term/ semester.

5.0 Appointment of a Supervisor:

On provisional admission, the respective ACPGS/ACRS shall propose a name of Supervisor who shall be a full-time member not below the rank of Assistant Professor having doctoral degree of the relevant Department/Institute and name (s) of Co-Supervisor (s) from within or outside the Department/Institute, if necessary. Final approval from the Academic Council shall be taken upon the recommendation of CHSR. The Supervisor shall

prescribe a plan of study to be undertaken by the student and supervise the progress of the student's work.

6.0 Academic Requirements and Regulations:

6.1 The minimum duration of the Ph. D. course shall be four terms / semesters from the date of provisional admission. A student must complete all requirements for the Ph. D. degree within six academic years (session) from the date of his provisional admission.

6.2 Academic progress shall be measured in terms of credit hours earned by a student. One credit hour of a theory course shall normally require one hour of class attendance per week for one Term/Semester; while one credit hour for thesis/project/laboratory should normally requires three hours of work per week for one Term/Semester. The number of credit hours for each subject shall be as specified in the syllabus of the respective Department/ Institute. The duration of each Term/ Semester is generally six months including thirteen weeks of classes and Term/ Semester final examination.

6.3 A student must complete a minimum of 54 credit hours of which a minimum of 45 credit hours shall be assigned for a thesis.

6.4 There shall be two categories of students namely, full-time students and part-time students. Through the proper channel a student may apply to the respective Head/Director to change his/ her status between full time and part time. Approval from the Academic Council is to be taken before the change is made operative. The status of studentship shall be reflected in his/ her transcript.

6.4.1 Students, serving in organizations, including this University may be admitted as part-time students with a written consent of the employer. A part-time student may be assigned maximum 9 credit hours of course work in any term / semester. In case of thesis course, a maximum of 12 credit hours may be assigned for a part time student in any term/ semester.

6.4.2 Full-time student must register for a minimum of 12 credit hours and maximum of 15 credit hours per term / semester. A full-time student shall not be allowed to be in the employment of any organization

(even as part-time employee). However, they may be employed as Teaching/Research Assistant or Research Associate at this University.

6.5 The subjects of study in the Department/ Institute shall be proposed by the respective ACPGS/ACRS. Upon recommendation of the CHSR, the Academic Council of the University shall give the final approval after due consideration.

6.6 The courses to be offered in any term/ semester shall be as determined by the relevant department/institute. The Department/Institute may review the curriculum and courses from time to time and propose any change, as may be considered necessary to the CHSR.

7.0 Grading System:

7.1 Numerical marking may be made in answer scripts, tests etc., but all final grading to be reported to the Controller of Examinations shall be in the letter grade system as detailed below:

	Mark Range				Letter Grade	Grade Point
90%	and		above		A+	4.0
85%	to		below	90%	A	3.75
80%	to		below	85%	A-	3.5
75%	to		below	80%	B+	3.25
70%	to		below	75%	B	3.0
65%	to		below	70%	B-	2.75
60%	to		below	65%	C+	2.5
55%	to		below	60%	C	2.25
50%	to		below	55%	D	2.0
below			50%		F	0.0
					I	Incomplete
					S	Satisfactory
					U	Unsatisfactory
					W	Withdrawn

7.2 'I' is given only when a student is unable to complete the course because of circumstances beyond his control. If must be made up by the close of next two term / semester or the incomplete grade becomes a failure. He may however be

allowed to register without further payment of tuition fees for that course.

7.3 Satisfactory or Unsatisfactory shall be used only as final grades for thesis and non-credit courses. Grade for thesis "In Progress" shall be so recorded what it is to be continued. If, however, thesis is discontinued an "Incomplete" grade shall be recorded.

7.4 A student shall withdraw officially from a course within two working weeks of the commencement of the term / semester or else his grade in that course shall be recorded as F unless he is eligible to get a grade of I. A student may be permitted to withdraw and change his course within the specified period with the approval of his Supervisor, Head of the Department/Director of the Institute and the respective teacher(s) concerned.

8.0 Doctoral Committee:

8.1 The Doctoral Committee for every student shall be proposed by the respective ACPGS/ ACRS, in consultation with the Supervisor. Upon recommendation of the CHSR the Academic Council of the University shall give the final approval after due consideration. The Doctoral Committee shall be formed within six months from the date of the student's provisional admission. The Doctoral Committee should meet from time to time at the request of the Supervisor to review the progress of the student's work. In special circumstances, the CHSR may approve any addition and/or alteration in the Doctoral Committee on the recommendation of the respective ACPGS/ ACRS of the Department/ Institute.

8.2 The composition of the Doctoral Committee shall be as follows:

(i)	Supervisor	Chairman
(ii)	Co-supervisor (s) (if any)	Member
(iii)	Head of the Department/ Director of Institute (Ex-officio)	Member
(iv)	Three teachers from within the University (at least one teacher from outside the student's Department/ Institute) who have Ph. D. degree & minimum Associate Professor	Members
(v)	One professor from outside the University	External Member

Quorum: Presence of five members will form quorum including supervisor, Head of the Department/ Director of the Institute and external members.

9.0 Thesis Proposal:

The student shall submit a thesis proposal to the Doctoral Committee, which shall examine the proposal and recommend it to the respective ACPGS/ ACRS of the Department/ Institute to take necessary steps for final approval from the Academic Council of the university. In special circumstances the Doctoral Committee may recommend through the respective ACPGS/ ACRS of the Department/Institute to CHSR for approval for any change of research topic/content, etc.

10.0 Conduct of Examinations for Course Work:

10.1 In addition to tests, assignments and /or examinations during the Term/Semester as may be given by the teacher(s) concerned, there shall be a written final examination for each of the course offered at the end of a Term/Semester. The dates of the Term/Semester final examinations shall be announced by the Controller of Examinations as advised by the Chairman of the Examination Committee at least two weeks before the commencement of the examination. The final grade in a course shall be based on the performance in all tests, assignments and/or examinations.

10.2 The Controller of Examinations shall keep up to date record of all the grades obtained by a student in individual Academic Record Card. Grades shall be announced by the Controller of Examinations at the end of each term / semester. In addition, each student is entitled to get one official transcript of the University record without any fee at the completion of the academic program from the office of the Controller of Examinations on production of statement of clearance from all Department/Institute Offices.

10.3 The ACPGS/ACRS of the respective department/institute shall propose to the Academic Council for final approval of the names of the paper setters and examiners for the term/ semester final examinations of the courses at least two weeks before the date of commencement of the examination.

11.0 Qualifying Requirements:

The following are qualifying requirements for the degree Ph. D.

11.1 Comprehensive Examination:

Every student shall pass the comprehensive examination before starting the thesis work. The comprehensive examination shall comprise a written examination and/ or an oral examination to test the knowledge of the student in his/ her field of study. The Doctoral Committee shall conduct the comprehensive examination. If a student fails to qualify in a comprehensive examination, he/she shall be given one more chance to appear at the examination as scheduled by the Doctoral Committee. The date and time of the comprehensive examination shall be fixed by the Doctoral Committee on the request of the Supervisor. Comprehensive Examination shall ordinarily be held after the completion of the course work by the student.

11.2 Course work:

To qualify for the degree a student must earn a minimum grade point of 2.75 based on the weighted average in his/her course work.

11.3 Thesis:

11.3.1 Research work for the thesis shall be carried out in the University or at a place(s) approved by the Doctoral Committee in consultation with the Supervisor.

11.3.2 The student shall certify that the research work was done by him/her and that this work has not been submitted elsewhere for any other purpose (except for publication).

11.3.3 At the end of the student's research work the student shall submit a thesis which must be an original contribution to engineering or physical science and worthy of publication. Every student through his/ her supervisor shall submit required number of computer composed copies of his/ her thesis in the approved format (as given in Appendix) to the Head of the Department or Director of the Institute. The Head of the Department/ Director of the Institute shall immediately send copies of the thesis to the Controller of Examinations. The Controller of Examinations shall send the same to all members of

the Examination Board (as constituted in Art. 11.2.6). In addition, the thesis shall be referred to two experts (at least one member shall be from abroad) nominated by the Academic Council. The respective ACPGS/ ACRS shall propose a panel of experts to the Academic Council, in addition to the Examination Board (Art. 11.3.6).

11.3.4 The expert shall preferably send his/ her evaluation report in a prescribed format within two months from the date of receipt of the thesis. The expert may include in his/ her report an overall assessment, preferably chapter-wise, placing the thesis in any one of the following categories:

11.3.4.1 Recommend the acceptance of the thesis in its present form and classify as HIGHLY RECOMMENDED/ RECOMMENDED.

11.3.4.2 Recommend the acceptance of the thesis with minor corrections. In this case, the student shall incorporate the corrections in the thesis and submit the corrected copy to the respective member (s), if required.

11.3.4.3 Defer the recommendation at this stage and the student shall incorporate the suggested modifications in the thesis and the corrected thesis along with the student's clarifications shall be sent to the respective examiner (s).

11.3.4.4 Reject the thesis for the reasons set out in the detailed report.

11.3.5 Upon receipt of the thesis evaluation reports from the experts in sealed envelopes, the Controller of Examinations shall fix a suitable date with prior consent of all members of the Examination Board for oral examination. The Controller of Examinations shall handover the thesis evaluation reports to the Chairman of the Examination Board just before the oral examination. The Controller of Examinations shall assist the Examination Board for conducting the oral examination as constituted in Art. 11.3.6. Any addition, revision, modification, etc., suggested by the experts and the examination board members shall be carried out by the student before submitting the

corrected thesis to the office of the Controller of Examinations as per Art. 11. 4.

11.3.6 **Oral Examination:**

11.3.6.1 There shall be an Examination Board consisting of minimum six members for conducting the oral examination for every doctoral student. The Supervisor shall act as the Chairman and the Head of the Department will be an ex-officio member of the Examination Board. The Examination Board shall be proposed, in consultation with the Supervisor, by the respective ACPGS/ ACRS of the relevant Department/ Institute, for final approval of the Academic Council followed by the recommendation of the CHSR.

The Examination Board shall be constituted as follows:

(i)	Supervisor	Chairman
(ii)	Co-supervisor (s) (if any)	Member
(iii)	Head of the Department/ Director of Institute (Ex-Officio)	Member
(iv)	Two or Three teachers from within the University who have Ph. D. degree & minimum Associate Professor	Members
(v)	Two members from outside the University	External Members

Quorum: Presence of five members will form quorum including supervisor, Head of the Department/ Director of the Institute and external members.

11.3.6.2 The Head of the Department/ Director of Institute will immediately send the resolution taken by the Examination Board with his forwarding to the Controller of Examinations.

11.3.7 If any examiner is unable to accept the appointment or has to relinquish his/her appointment before/during the examinations, the Vice-Chancellor shall

appoint another examiner in his/her place, on suggestion from the Supervisor in consultation with the respective Head/ Director of the Department/ Institute. This appointment will be reported to the CHSR.

11.3.8 The student must satisfy the examiners (as constituted in Art. 11.3.6) that he/she is capable of intelligently applying the results of this research to the solution of problems, of undertaking independent work and afford evidence of satisfactory knowledge related to the theory and technique used in his/her research work.

11.4 Upon satisfactory completion of the oral examination, the student shall submit N+2, where N is the number of members of the Examination Board, hard copies of the corrected thesis as per prescribed format and specification, duly certified by the Supervisor and Co- Supervisor (if any) that all the corrections have been incorporated in the thesis as suggested by the Board of Examiners.

12.0 Striking off and Removal of Name from the Rolls:

The name of the student shall be struck off and removed from the rolls of the University on the following grounds:

(i) Nonpayment of dues within prescribed period. Post-Graduate students residing in the Halls of Residence shall be subject to the same conditions and rules as provided in the ordinance relating to Student's Discipline Rule.

(ii) Failing to proceed with the program by the exercise of Art. 6.1 or 11.0 of this Rules & Regulations.

(iii) Failing to make satisfactory progress in his/her program as reported by the supervisor through the ACPGS/ACRS and approved by CHSR.

(iv) Forced to discontinue his/her studies under disciplinary rules.

(v) Withdrawn officially from all the courses including thesis.

13.0 Publication of Results:

(i) A student who successfully completes the prescribed courses and all academic requirements for fulfilment of the postgraduate degree will have to apply to the Controller of

Examinations through the Head of the Department for the award of degree.

(ii) The Controller of Examinations shall publish the result.

(iii) Provisional degree will be awarded, on completion of minimum credit and CGPA requirements, by the Academic Council.

14.0 Academic Fees:

Academic fees shall be decided time to time by the University authority.

15.0 Return of Fees:

A student withdrawing officially from all courses including project/thesis as per Art.12 (v) is entitled to get a refund of 50% of the course registration fees, provided he/she withdraws in writing through the respective Head of the Department before the expiry of two working weeks from the commencement of the classes; and in that case his/her grade in the courses registered shall be recorded as "W". If withdrawal is made after the expiry of two weeks from the commencement of classes no refund shall be allowed and the grade should be recorded as failure, unless he is eligible to get a grade of "Incomplete" as per Art. 7.2. Thesis/Project registration fees in any case are not refundable.

APPENDIX-I

Academic Fees

University Registration Fee	Taka ……
Admission / Enrolment Fee	Taka ……
Course Registration Fee	Taka ……. per credit hour with a maximum of Taka……...…… per Semester, Payable in 2 instalments.
Project Registration Fee	Taka ……. (On 1st Project registration).
Fees for each additional copy of Transcript	Taka …….
Medical Fees	Taka ……per semester
Caution Money at first enrolment	Taka ……
Library Caution Money	Taka …….

* Caution money may be refunded if the student withdraws officially from all the courses including project or at the end of his academic program and the amount will be determined from the statement of clearance from all Departments/ Institutes/ Offices.

APPENDIX-II

Format for Thesis of Ph. D. Degree M. Phil., M. Sc. and Project Report of M. Engg., PG. Dip.,

The following set of instructions may be followed as standard format for the thesis / project report.

1. **Size and Thickness of Paper:**

   Thesis / Project is to be printed on A4 size quality offset paper and minimum weight of paper should be 70 gm.

2. **Typing or Print:**

   The typeface should be consistent and the copy must be clean for both text and illustration. Dot matrix printers should not be used unless giving near letter quality. The general text of the thesis / project report should be spaced at one and a half with single spacing for footnotes or lengthy quotations. Triple or larger spacing may be used where necessary to set off headings, subheadings or illustrations. The thesis / project report must be in "letter quality" print and laser printing are recommended. And standard type (font) may be used but it must be consistent throughout. The print size should be at least 10 points (or equivalent) not exceeding 12 points.

3. **Margins and Layout of Text:**

   There must be a margin of 4 cm to allow for binding on the left-hand side of the paper. Minimum margins of 3 cm are required at the top and the bottom. A 2.5 cm margins is required at the right-hand side. This also applies to table and figures.

4. **Pagination:**

   The text is to be numbered consecutively in the top right-hand corner of the page, beginning with the first page of the text. The page numbers are to be approximately 2.5 cm (1 inch) from the right-hand edge of the page. The number does not appear on the first page of the text although is understood to be a numeral '1'. All figures, tables, appendices and similar materials are numbered as pages of the text through to the end of the thesis / project. Material preceding the first page of the text is to be numbered in small roman numerals centered at the bottom of each page. The title page is considered to be page but it is not so indicated.

5. Word Spacing and Division:

Text should be set to ensure an even spacing between words for any particular line. Word division at the ends of lines (hyphenation) should be avoided if possible.

6. **Illustrations:**

Tables, figures, photographs, and other illustrations must always be referred to in the text. They should be arranged neatly and effectively. They should be in black ink. or be high quality photocopies, photo-offset, or photographs. They should be presented on paper of similar weight to that used in the thesis / project report. Oversize maps charts or diagrams must be folded so that they can be bound with the pages or inserted in a pocket. Original photographs or photo-offset must be provided in all required copies of the thesis / project report. They should be properly pasted on paper with permanent non-wrinkle glue. Photographs printed on 21.5 cm X 28 cm (8 ½ in X 11 in) photographic paper or photo-offsets are preferred rather than being pasted on. High quality computer graphics (black and white or color) and high-quality color photocopies are acceptable. All required copies must be identical.

The title of a table must be above the table and the title on the figure, below the figure. The student should consult with the thesis / project supervisor if any difficulty arises in the placing of illustrations.

7. Computer Disks:

If a student wishes to include computer disks as a part of his data, he must submit a disk for each required copy of his thesis. These must be submitted loosely. If is not necessary to submit them at the time he schedules his defense. In this case there should be a pocket in the thesis / project report on the inside back cover. He should also indicate the presence of computer disks in his Table of Contents.

8. **Binding and Colour:**

Sewn and bound in strong, waterproof cloth. Not more than 6.5 cm thick. Maroon colour for Ph. D., Black for M. Engg., M.Sc. Engg. or M.Phil. degree.

9. **Lettering:**

In golden on spine only.

Top	:	Degree
Middle	:	Name of author (initials and surname)
Foot	:	Year of Presentation.
Cover Page	:	In golden on Cover.
Positioning	:	Centre Justified, Title, Name, Dept.

10. **Order of Items:**

10.1 Title Page:

The student should follow the following instruction for title page:

10.1.1 The title of the thesis should appear in 12-point boldface upper- and lower-case letters.

10.1.2 The word 'by' should in lower case letters.

10.1.3 The name of the author should be in upper- and lower-case letters, and should be identical to the one in the copyright page. The name used must be the student's legal name as it appears on the University records.

10.1.4 Write out the full name of the degree in uppercase letters for which the work is presented, e.g., DOCTOR OF PHILOSPHY, MASTER OF SCIENCE IN CIVIL ENGINEERING, MASTER OF SCIENCE IN COMPUTER SCIENCE & ENGINEERING.

10.1.5 Under major subject, the student should write the name of the department in full e.g., Civil Engineering.

10.1.6 Type in CHITTAGONG UNIVERSITY OF ENGINEERING AND TECHNOLOGY in uppercase letters.

10.1.7 The date of the title page should indicate only the year of the defense.

10.2 **Certification page of Thesis / Project Report Approval:**

The certification page of Thesis / Project Report Approval should be as per the format of Annexure I of this Appendix-II

10.3 **Declaration Page:**

The Declaration page should be as per the format of Annexure II of this Appendix-II

10.4 **Dedication (optional)**

10.5 **Table of Contents:**

The decimal system is advised for mentioning the headings and sub headings of the chapter. Each heading and subheadings appearing in the Table of Contents must appear in the text of the thesis / project report.

10.6 **List of Tables and Figures:**

A List of Tables and Figures should follow the Table of Contents. Each should appear on separate page with the appropriate page numbers. However, if the lists are very short, they may be combined on one page under the title "List of Tables and Figures". It is advised that the decimal system (e.g., figure 3.2 is the second figure in chapter 3) be used for figures if this system is followed for headings.

10.7 **List of Abbreviations of Technical Symbols and Terms:**

Page of the list of Abbreviations of Technical Symbols and Terms should be incorporated following the page of list of Tables and Figures. In this respect the student is advised to consult information sources such as Abbreviations Published by the American Standards Association and other information sources available in the Central Library. These abbreviations are also frequently found listed at the back of standard texts on technical writing.

10.8 **Acknowledgements:**

These should be given on a page following the List of Abbreviations of Technical Symbols and Terms. The student should acknowledge advice, service encouragement, library and information service support and source of financial support.

10.9 **Abstract:**

The student is required to incorporate an abstract following the page of acknowledgement. The abstract must be no longer than can be accommodated in single space type on one side page only.

10.10 Main Body of Text:

10.10.1 Heading and Sub-headings

Headings and subheadings of the text must be consistent and correspond to the headings given in the Table of Contents. Each major chapter should begin on a new page.

10.11 Reference/Bibliography:

Notes and bibliography/references should be typed in single spacing. A consistent policy should be used, interesting the notes at the foot of page or at the end of each chapter or at the thesis/project report. References must be complete, clear and exact and must be given sufficient information to enable any person reading the thesis/project report to find the references quickly and easily. A reference to an article in a journal must include author's name and initials, the title of articles, the title of the journal, date/year, volume if applicable, issue number if applicable and inclusive pages. A reference to a book must include the name of the author with initials, title of the book, title of article in the book, volume if applicable, editor if applicable, place of publication if applicable, publishers if applicable, year of publication and Specific page number. If titles of journals are abbreviated, they must follow a standard form as used in a reputed research journal. All references listed in the reference section must be cited in the text. References to conference proceedings must include the date and location of conference. The student is all allowed a certain freedom of choice, since methods of handing references in the text and listing them varies. However, the student is advised to use that employed in the most reputed journals in his field. Above all, they must be consistent in format. Alphabetical listing of references by author is preferable.

10.12 Appendices:

Appendices are included to provide detailed information that would otherwise detract the readability of the main body of the text. Computer programs, lengthy tables and detailed laboratory procedures etc. are a few examples of material to be included in the Appendix. Appendices must be paginated in accordance with the text.

ANNEXURE-III

The dissertation/thesis/project titled…….....
.....……
…….....….....……
……...

Submitted by…….....
.
Roll No…….....Session…….....
.....
has been accepted as satisfactory in partial fulfilment of the requirement for the degree of ….....……..... ...
.....……on…….....
.....

BOARD OF EXAMINERS

1. (Signature)
   Name of the Supervisor
   Designation & Address — Chairman

2. (Signature) — Member
   Name of the Co-Supervisor (if any)
   Designation & Address

3. (Signature)
   Name of the Internal Member
   Designation & Address — Member

4. (Signature)
   Name of the Internal Member
   Designation & Address — Member

5. (Signature)
   Name of the Head of the Dept. — Member
   Designation & Address — (Ex-Officio)

6. (Signature)
   Name of the External Member — Member
   Designation & Address — (External)

ANNEXURE-IV

CANDIDATE'S DECLARATION

It is hereby declared that this thesis or any part of it has not been submitted elsewhere for the award of any degree or diploma.

Signature of the Candidate

_____

Name of the Candidate

সংশোধনী

সিদ্ধান্ত্ম-১০৩/১১(গ) t (iii) স্নাতকোত্তর পর্যায়ের শিড়্গার্থীরা ÔI' Grade প্রাপ্ত হলে তা Academic Transcript এ প্রতিফলিত হবে না।

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